Appendix A

Air Quality and Greenhouse Gas Emissions Impact Analysis

AIR QUALITY AND GREENHOUSE GAS EMISSIONS IMPACT ANALYSIS

KASSAB TRAVEL CENTER PROJECT

CITY OF LAKE ELSINORE

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ACRONYMS AND ABBREVIATIONS

Air Basin	South Coast Air Basin
AQMP	Air Quality Management Plan
CAAQS	California Ambient Air Quality Standards
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DPM	Diesel particulate matter
EPA	Environmental Protection Agency
ºF	Fahrenheit
GHG	Greenhouse gas
GWP	Global warming potential
HFCs	Hydrofluorocarbons
IPCC	International Panel on Climate Change
LST	Localized Significant Thresholds
MSAT	Mobile Source Air Toxics
$MTCO_2e$	Metric tons of carbon dioxide equivalent
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NO_x	Nitrogen oxides
NO_2	Nitrogen dioxide
O_3	Ozone
PM	Particle matter
PM10	Particles that are less than 10 micrometers in diameter
PM2.5	Particles that are less than 2.5 micrometers in diameter
PPM	Parts per million
PPB	Parts per billion

PPT	Parts per trillion
RTIP	Regional Transportation Improvement Plan
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO_x	Sulfur oxides
TAC	Toxic air contaminants
UNFCCC	United Nations' Framework Convention on Climate Change
VOC	Volatile organic compounds

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Air Quality and Greenhouse Gas Emissions Impact Analysis has been completed to determine the air quality and greenhouse gas (GHG) emissions impacts associated with the proposed Kassab Travel Center project (proposed project). The following is provided in this report:

- A description of the proposed project;
- A description of the atmospheric setting;
- A description of the criteria pollutants and GHGs;
- A description of the air quality regulatory framework;
- A description of the air quality and GHG emissions thresholds including the California Environmental Quality Act (CEQA) significance thresholds;
- An analysis of the short-term construction related and long-term operational air quality and GHG emissions impacts;
- An analysis of the conformity of the proposed project with the South Coast Air Quality Management District (SCAQMD) Air Quality Management Plan (AQMP); and
- An analysis of the conformity of the proposed project with all applicable GHG emissions reduction plans and policies.

1.2 Site Location and Study Area

The project site is located in the northern portion of the City of Lake Elsinore (City) on the west corner of Riverside Drive and Collier Avenue at 29301 Riverside Drive. The approximately 2.84-acre project site is located on a vacant parcel that is bounded by commercial uses to the northwest, Collier Avenue and commercial uses to the northeast, Riverside Drive and vacant land to the southeast, and vacant land to the southwest. The project local study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest offsite sensitive receptors to the project site consist of workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet west of the project site. The nearest school to the project site is Temescal Canyon High School that is located as near as 0.5 mile north of the project site.

1.3 Proposed Project Description

The proposed project would consist of the development of an 18-vehicle fueling position gasoline and diesel station with two canopies that total 6,092 square feet, an 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include multiple parking areas with a total of 78-spaces. The proposed site plan is shown in Figure 2.

1.4 Standard Air Quality and GHG Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the SCAQMD and State of California (State).

South Coast Air Quality Management District Rules

The following lists the SCAQMD rules that are applicable to all non-residential projects in the South Coast Air Basin (Air Basin).

Rule 402 - Nuisance

Rule 402 prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Compliance with Rule 402 will reduce local air quality and odor impacts to nearby sensitive receptors.

Rule 403- Fugitive Dust

Rule 403 governs emissions of fugitive dust during construction activities and requires that no person shall cause or allow the emissions of fugitive dust such that dust remains visible in the atmosphere beyond the property line or the dust emission exceeds 20 percent opacity, if the dust is from the operation of a motorized vehicle. Compliance with this rule is achieved through application of standard Best Available Control Measures, which include but are not limited to the measures below. Compliance with these rules would reduce local air quality impacts to nearby sensitive receptors.

- Utilize either a pad of washed gravel 50 feet long, 100 feet of paved surface, a wheel shaker, or a wheel washing device to remove material from vehicle tires and undercarriages before leaving project site.
- Do not allow any track out of material to extend more than 25 feet onto a public roadway and remove all track out at the end of each workday.
- Water all exposed areas on active sites at least three times per day and pre-water all areas prior to clearing and soil moving activities.
- Apply nontoxic chemical stabilizers according to manufacturer specifications to all construction areas that will remain inactive for 10 days or longer.
- Pre-water all material to be exported prior to loading, and either cover all loads or maintain at least 2 feet of freeboard in accordance with the requirements of California Vehicle Code Section 23114.
- Replant all disturbed area as soon as practical.
- Suspend all grading activities when wind speeds (including wind gusts) exceed 25 miles per hour.
- Restrict traffic speeds on all unpaved roads to 15 miles per hour or less.

Rules 461 – Gasoline Dispensing Facilities

Rule 461 governs the operation of gasoline stations and requires that all underground storage tanks are equipped with a "CARB certified" enhanced vapor recovery system, all fill tubes are equipped with vapor tight caps, all dry breaks are equipped with vapor tight seals, a spill box shall be installed to capture any gasoline spillage, and all equipment is required to be properly maintained per CARB regulations. All gasoline dispensing units are required to be equipped with a "CARB certified" vapor recovery system, the dispensing system components all maintain vapor and liquid tight connections at all times and the breakaway coupling shall be equipped with a poppet valve that shall close when coupling is separated. Rule 461 also provides several additional requirements including detailed maintenance, testing, reporting, and recordkeeping requirements for all gas stations.

Rules 1108 and 1108.1 – Cutback and Emulsified Asphalt

Rules 1108 and 1108.1 govern the sale, use, and manufacturing of asphalt and limits the VOC content in asphalt. This rule regulates the VOC contents of asphalt used during construction as well as any on-going maintenance during operations. Therefore, all asphalt used during construction and operation of the proposed project must comply with SCAQMD Rules 1108 and 1108.1.

Rule 1113 – Architectural Coatings

Rule 1113 governs the sale, use, and manufacturing of architectural coatings and limits the VOC content in sealers, coatings, paints and solvents. This rule regulates the VOC contents of paints available during construction. Therefore, all paints and solvents used during construction and operation of the proposed project must comply with SCAQMD Rule 1113.

Rule 1143 – Paint Thinners

Rule 1143 governs the sale, use, and manufacturing of paint thinners and multi-purpose solvents that are used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations. This rule regulates the VOC content of solvents used during construction. Solvents used during construction and operation of the proposed project must comply with SCAQMD Rule 1143.

State of California Rules

The following lists the State of California rules that are applicable to all nonresidential projects in the State.

CARB Regulation for In-Use Off-Road Diesel Vehicles

On July 26, 2007, the California Air Resources Board (CARB) adopted California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449 to reduce diesel particulate matter (DPM) and NOx emissions from in-use off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. Performance requirements of the rule are based on a fleet's average NOx emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirement making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less). Currently, no commercial operation in California may add any equipment to their fleet that has a Tier 0 or Tier 1 engine. By January 1, 2018 medium and large fleets will be restricted from adding Tier 2 engines to their fleets and by January 2023, no commercial operation will be allowed to add Tier 2 engines to their fleets. It should be noted that commercial fleets may continue to use their existing Tier 0 and 1 equipment, if they can demonstrate that the average emissions from their entire fleet emissions meet the NOx emissions targets.

CARB Resolution 08-43 for On-Road Diesel Truck Fleets

On December 12, 2008 the CARB adopted Resolution 08-43, which limits NOx, PM10 and PM2.5 emissions from on-road diesel truck fleets that operate in California. On October 12, 2009 Executive Order R-09-010 was adopted that codified Resolution 08-43 into Section 2025, title 13 of the California Code of Regulations. This regulation requires that by the year 2023 all commercial diesel trucks that operate in California shall meet model year 2010 (Tier 4 Final) or latter emission standards. In the interim period, this regulation provides annual interim targets for fleet owners to meet. By January 1, 2014, 50 percent of a truck fleet is required to have installed Best Available Control Technology (BACT)

for NOx emissions and 100 percent of a truck fleet installed BACT for PM10 emissions. This regulation also provides a few exemptions including a onetime per year 3-day pass for trucks registered outside of California. All on-road diesel trucks utilized during construction of the proposed project will be required to comply with Resolution 08-43.

California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24) standards require the installation of insulated hot water pipes, improved window performance, improved wall insulation, and mandatory duct sealing. Other Title 24 requirements include the use of cool roofing shingles, a minimum 1-inch air space between roof material and roof deck, and a minimum of R-22 roof/ceiling insulation. All lighting is required to be high efficiency and daylight sensors and motion sensors are required for outdoor lighting, bathrooms, utility rooms, and other spaces. The forced air systems are required to limit leakage to 5 percent or less and requires all heat pump systems to be equipped with liquid line filter driers. The 2016 Title 24 Part 6 standards are anticipated to reduce electricity consumption by 281 gigawatt-hours per year and natural gas consumption by 16 million therms per year (http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf).

California Code of Regulations (CCR) Title 24, Part 11

CCR Title 24, Part 11: *California Green Building Standards* (Title 24) requires that new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant-emitting finish materials. One focus of CCR Title 24, Part 11 is water conservation measures, which reduce GHG emissions by reducing electrical consumption associated with pumping and treating water. CCR Title 24, Part 11 has approximately 52 nonresidential mandatory measures and an additional 130 provisions for optional use. Some key mandatory measures for non-residential buildings include a 20 percent reduction of potable water use within buildings through use of low-flow fixtures, a 50 percent construction waste diversion from landfills, and use of building finish materials and carpets that emit low levels of volatile organic compounds.

1.5 Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines air quality and GHG emissions checklist questions.

Conflict with or obstruct implementation of the applicable air quality plan?

Less than significant impact.

Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less than significant impact.

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?

Less than significant impact.

Expose sensitive receptors to substantial pollutant concentrations?

Less than significant impact.

Create objectionable odors affecting a substantial number of people?

Less than significant impact.

Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than significant impact.

Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?

Less than significant impact.

1.6 Project Design Features Incorporated into the Proposed Project

This analysis was based on implementation of the following project design features that are either already depicted on the proposed project site plan and architectural plans or are required from State Regulations.

Project Design Feature 1

The project applicant shall implement Measure T-1.2 from the Climate Action Plan, which requires the installation of sidewalks along the project site boundary that is adjacent to Riverside Drive and Collier Avenue as well as internal sidewalks to connect to neighborhood activity centers, major destinations, and transit facilities.

Project Design Feature 2

The project applicant shall implement Measure T-1.4 from the Climate Action Plan, which requires the installation of a Class II bike lane along the project site boundary with Riverside Drive and Collier Avenue as specified in the Bikeway Plan depicted in the City of Lake Elsinore General.

Project Design Feature 3

The project applicant shall implement Measure T-1.5 from the Climate Action Plan, which requires the installation of bicycle parking spaces to equal five percent of the visitor parking capacity. This shall be achieved by providing a two-bike capacity rack east of the entrance to the Convenience Store and a two-bike capacity rack south of the entrance the Drive-Thru Restaurant, as detailed on the Site Plan (See Figure 2).

Project Design Feature 4

The project applicant shall implement Measure T-4.1 from the Climate Action Plan, which requires the institution of a trip reduction program for employers with fewer than 100 employees. The trip reduction program shall consist of a board in the employee work area of the Convenience Store and Drive-Thru Restaurant that provides bus route maps and information about carpooling and bicycling to work.

Project Design Feature 5

The project applicant shall prepare a Landscape Plan that meets the requirements of Measures E-1.1 and E-4.1 from the Climate Action Plan, which requires that all new developments plant a minimum one 15 gallon nondeciduous umbrella form tree per 30 linear feet of boundary length (minimum of 47 trees for the project site) and that the Landscape Plan is designed to be consistent with the requirements detailed in Assembly Bill 1881.

Project Design Feature 6
The project applicant shall implement Measure E-1.2 from the Climate Action Plan, which requires the use of roofing material that has an initial Solar Reflectance Index (SRI) of 75 (or 0.75 if on 1.0 scale) or higher as detailed in Section 140.3 of the 2013 Title 24 Part 6 (CalGreen) Building Standards.

Project Design Feature 7
The project applicant shall implement Measure S-1.1 from the Climate Action Plan, which require the project applicant to contract with a waste provider that provides recycling services that diverts a minimum of 65 percent of the solid waste generated by the proposed project.

Project Design Feature 8
The project applicant shall implement Measure S-1.4 from the Climate Action Plan, which requires that the building contractor recycles a minimum of 65 percent of the nonhazardous construction debris generated from construction of the proposed project. This shall be achieved by the preparation of a waste management plan for the project and a copy of the completed waste management report will be submitted to the City at the completion of construction.

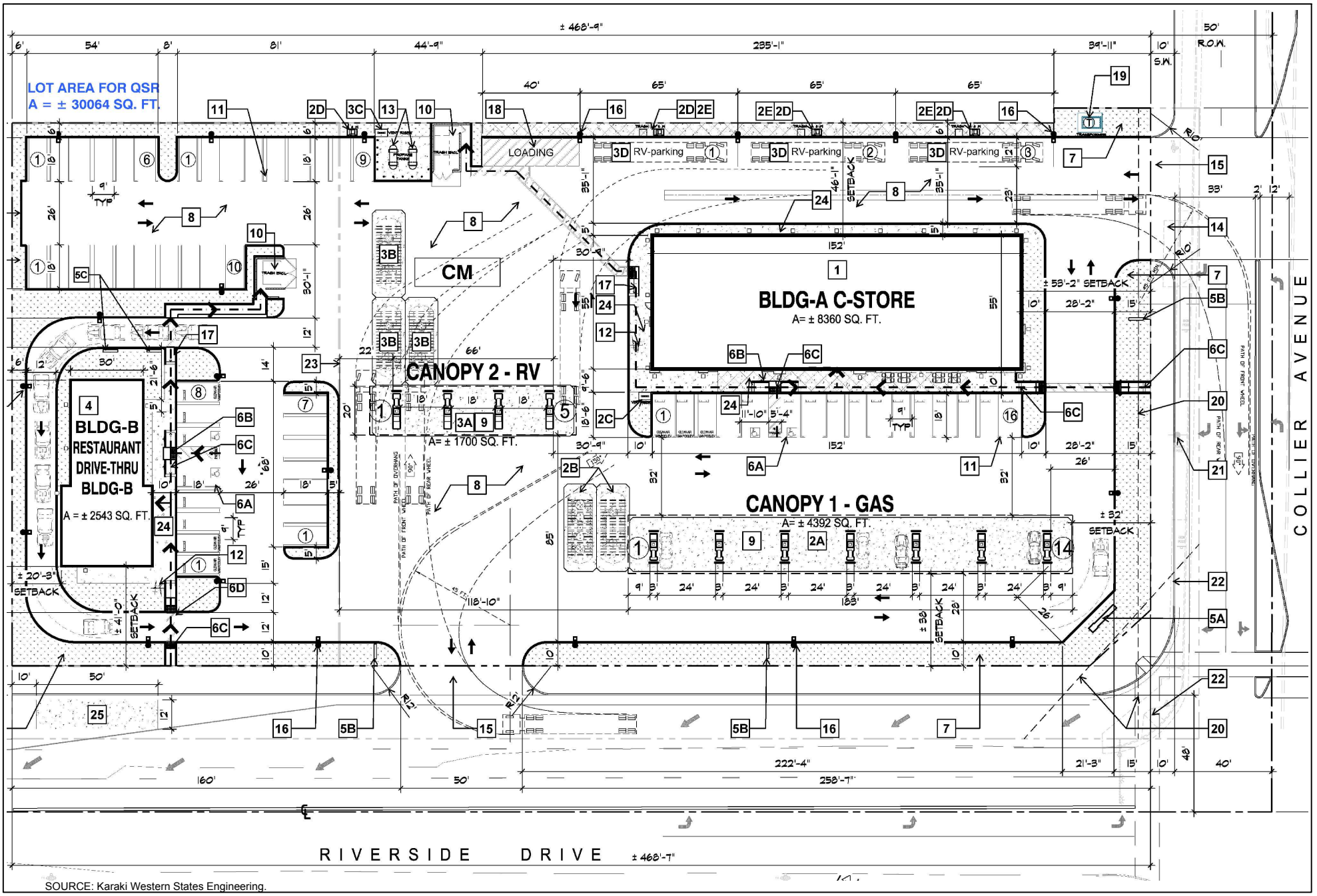
1.7 Mitigation Measures Required for the Proposed Project

This analysis found that implementation of the State and SCAQMD air quality and GHG emissions reductions regulations plus Project Design Features 1 through 8 were adequate to limit criteria pollutants, toxic air contaminants, odors, and GHG emissions from the proposed project to less than significant levels. No mitigation measures are required for the proposed project with respect to air quality and GHG emissions.

SOURCE: Google Earth

VISTA ENVIRONMENTAL

Figure 1
Project Local Study Area



SOURCE: Karaki Western States Engineering.

VISTA ENVIRONMENTAL

Figure 2
Proposed Site Plan

2.0 POLLUTANTS

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). A summary of federal and state ambient air quality standards is provided in the Regulatory Framework section.

2.1 Criteria Pollutants

The criteria pollutants consist of: ozone, nitrogen oxides, carbon monoxide, sulfur oxides, lead, and particulate matter. These pollutants can harm your health and the environment, and cause property damage. The Environmental Protection Agency (EPA) calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria for setting permissible levels. The following provides descriptions of each of the criteria pollutants.

Nitrogen Oxides

Nitrogen Oxides (NOx) is the generic term for a group of highly reactive gases which contain nitrogen and oxygen. While most NOx are colorless and odorless, concentrations of nitrogen dioxide (NO_2) can often be seen as a reddish-brown layer over many urban areas. NOx form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuel. NOx reacts with other pollutants to form, ground-level ozone, nitrate particles, acid aerosols, as well as NO_2, which cause respiratory problems. NO_x and the pollutants formed from NO_x can be transported over long distances, following the patterns of prevailing winds. Therefore controlling NOx is often most effective if done from a regional perspective, rather than focusing on the nearest sources.

Ozone

Ozone is not usually emitted directly into the air but in the vicinity of ground-level is created by a chemical reaction between NOx and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust, industrial emissions, gasoline vapors, chemical solvents as well as natural sources emit NOx and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form with the greatest concentrations usually occurring downwind from urban areas. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Because NOx and VOC are ozone precursors, the health effects associated with ozone are also indirect health effects associated with significant levels of NOx and VOC emissions.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes approximately 56 percent of all CO emissions nationwide. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are indoor sources of CO. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath

a layer of warm air. CO is described as having only a local influence because it dissipates quickly. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Sulfur Oxides

Sulfur Oxide (SOx) gases are formed when fuel containing sulfur, such as coal and oil is burned, as well as from the refining of gasoline. SOx dissolves easily in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment.

Lead

Lead is a metal found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is now the primary source of lead emissions to the air. High levels of lead in the air are typically only found near lead smelters, waste incinerators, utilities, and lead-acid battery manufacturers. Exposure of fetuses, infants and children to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Particulate Matter

Particle matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. PM is made up of a number of components including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. Particles that are less than 10 micrometers in diameter (PM10) are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Particles that are less than 2.5 micrometers in diameter (PM2.5) have been designated as a subset of PM10 due to their increased negative health impacts and its ability to remain suspended in the air longer and travel further.

2.2 Other Pollutants of Concern

Toxic Air Contaminants

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least 40 different toxic air contaminants. The most important of these TACs, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and

acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as from accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

TACs are less pervasive in the urban atmosphere than criteria air pollutants, however they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of TACs with varying degrees of toxicity. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

According to *The California Almanac of Emissions and Air Quality 2013 Edition*, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). DPM is a subset of PM2.5 because the size of diesel particles are typically 2.5 microns and smaller. The identification of DPM as a TAC in 1998 led the California Air Resources Board (CARB) to adopt the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles in September 2000. The plan's goals are a 75-percent reduction in DPM by 2010 and an 85-percent reduction by 2020 from the 2000 baseline. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot." Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California's identification of DPM as a toxic air contaminant was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to DPM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's potential airborne cancer risk from combustion sources.

Asbestos

Asbestos is listed as a TAC by CARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in mineral formations and crushing or breaking these rocks, through construction or other means, can release asbestiform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. The nearest likely locations of naturally occurring asbestos, as identified in the *General Location Guide for Ultramafic Rocks in California*, prepared by the California Division of Mines and Geology, is located in Santa Barbara County. The nearest historic asbestos mine to the project site, as identified in the *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California,* prepared by U.S. Geological Survey, is located at Asbestos Mountain, which is approximately 51 miles southeast of the project site in the San Jacinto Mountains. Due to the distance to the nearest natural occurrences of asbestos, the project site is not likely to contain asbestos.

2.3 Greenhouse Gases

Constituent gases of the Earth's atmosphere, called atmospheric greenhouse gases (GHGs), play a critical role in the Earth's radiation amount by trapping infrared radiation from the Earth's surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO_2), methane (CH_4), ozone (O_3), water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic (caused or produced by humans) emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as

global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. Transportation is responsible for 41 percent of the State's greenhouse gas emissions, followed by electricity generation. Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2, where CO_2 is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean. The following provides a description of each of the greenhouse gases and their global warming potential.

Water Vapor

Water vapor is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. The feedback loop in which water is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to "hold" more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there is also dynamics that put the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up).

Carbon Dioxide

The natural production and absorption of CO_2 is achieved through the terrestrial biosphere and the ocean. However, humankind has altered the natural carbon cycle by burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid-1700s, each of these activities has increased in scale and distribution. CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration with the first conclusive measurements being made in the last half of the 20th century. Prior to the industrial revolution, concentrations were fairly stable at 280 parts per million (ppm). The International Panel on Climate Change (IPCC) indicates that concentrations were 379 ppm in 2005, an increase of more than 30 percent. Left unchecked, the IPCC projects that concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources. This could result in an average global temperature rise of at least two degrees Celsius or 3.6 degrees Fahrenheit.

Methane

CH_4 is an extremely effective absorber of radiation, although its atmospheric concentration is less than that of CO_2. Its lifetime in the atmosphere is brief (10 to 12 years), compared to some other GHGs (such as CO_2, N_2O, and Chlorofluorocarbons (CFCs)). CH_4 has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide

Concentrations of N_2O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration of this GHG was documented at 314 parts per billion (ppb). N_2O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. N_2O is also commonly used as an aerosol spray propellant (i.e., in whipped cream bottles, in potato chip bags to keep chips fresh, and in rocket engines and race cars).

Chlorofluorocarbons

CFCs are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the Earth's surface). CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants, and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and in 1989 the European Community agreed to ban CFCs by 2000 and subsequent treaties banned CFCs worldwide by 2010. This effort was extremely successful, and the levels of the major CFCs are now remaining level or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

Hydrofluorocarbons

HFCs are synthetic man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2). Prior to 1990, the only significant emissions were HFC-23. HFC-134a use is increasing due to its use as a refrigerant. Concentrations of HFC-23 and HFC-134a in the atmosphere are now about 10 parts per trillion (ppt) each. Concentrations of HFC-152a are about 1 ppt. HFCs are manmade for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above Earth's surface are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). Concentrations of CF_4 in the atmosphere are over 70 ppt. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing.

Sulfur Hexafluoride

Sulfur Hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 has the highest global warming potential of any gas evaluated; 23,900 times that of CO_2. Concentrations in the 1990s were about 4 ppt. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Aerosols

Aerosols are particles emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning due to the

incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

2.4 Global Warming Potential

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to the reference gas, CO_2. The GHGs listed by the IPCC and the CEQA Guidelines are discussed in this section in order of abundance in the atmosphere. Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources. To simplify reporting and analysis, GHGs are commonly defined in terms of their GWP. The IPCCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2e. The GWP of CO_2 is by definition, 1. The GWP values used in this analysis are based on the IPCC Second Assessment Report (SAR) and United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines, and are detailed in Table A. The SAR GWPs are used in CARB's California inventory and AB32 Scoping Plan estimates.

Table A – Global Warming Potentials, Atmospheric Lifetimes and Abundances of GHGs

Gas	Atmospheric Lifetime (years)[1]	Global Warming Potential (100 Year Horizon)[2]	Atmospheric Abundance
Carbon Dioxide (CO_2)	50-200	1	379 ppm
Methane (CH_4)	9-15	25	1,774 ppb
Nitrous Oxide (N_2O)	114	298	319 ppb
HFC-23	270	14,800	18 ppt
HFC-134a	14	1,430	35 ppt
HFC-152a	1.4	124	3.9 ppt
PFC: Tetrafluoromethane (CF_4)	50,000	7,390	74 ppt
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200	2.9 ppt
Sulfur Hexafluoride (SF_6)	3,200	22,800	5.6 ppt

Notes:
[1] Defined as the half-life of the gas.
[2] Compared to the same quantity of CO_2 emissions and is based on the Intergovernmental Panel On Climate Change (IPCC) 2007 standard, which is utilized in CalEEmod (Version 2016.3.2), which is used in this report (CalEEmod user guide: Appendix A).
Definitions: ppm = parts per million; ppb = parts per billion; ppt = parts per trillion
Source: IPCC 2007, EPA 2015

3.0 AIR QUALITY MANAGEMENT

3.1 Regulatory Setting

The air quality at the project site is addressed through the efforts of various international, federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality are discussed below.

International

In 1988, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to evaluate the impacts of global climate change and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined other countries around the world in signing the United Nations' Framework Convention on Climate Change (UNFCCC) agreement with the goal of controlling GHG emissions. The parties of the UNFCCC adopted the Kyoto Protocol, which set binding GHG reduction targets for 37 industrialized countries, the objective of reducing their collective GHG emissions by five percent below 1990 levels by 2012. The Kyoto Protocol has been ratified by 182 countries, but has not been ratified by the United States. It should be noted that Japan and Canada opted out of the Kyoto Protocol and the remaining developed countries that ratified the Kyoto Protocol have not met their Kyoto targets. The Kyoto Protocol expired in 2012 and the amendment for the second commitment period from 2013 to 2020 has not yet entered into legal force. The Parties to the Kyoto Protocol negotiated the Paris Agreement in December 2015, agreeing to set a goal of limiting global warming to less than 2 degrees Celsius compared with pre-industrial levels. The Paris Agreement has been adopted by 195 nations with 147 ratifying it, including the United States by President Obama, who ratified it by Executive Order on September 3, 2016. On June 1, 2017, President Trump announced that the United States is withdrawing from the Paris Agreement, however the Paris Agreement is still legally binding by the other remaining nations.

Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere—CFCs, halons, carbon tetrachloride, and methyl chloroform—were to be phased out, with the first three by the year 2000 and methyl chloroform by 2005.

Federal – United States Environmental Protection Agency

The Clean Air Act, first passed in 1963 with major amendments in 1970, 1977 and 1990, is the overarching legislation covering regulation of air pollution in the United States. The Clean Air Act has established the mandate for requiring regulation of both mobile and stationary sources of air pollution at the state and federal level. The Environmental Protection Agency (EPA) was created in 1970 in order to consolidate research, monitoring, standard-setting and enforcement authority into a single agency.

The EPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. NAAQS pollutants were identified using medical evidence and are shown below in Table B.

Table B – State and Federal Criteria Pollutant Standards

Air Pollutant	Concentration / Averaging Time		Most Relevant Effects
	California Standards	Federal Primary Standards	
Ozone (O_3)	0.09 ppm / 1-hour 0.07 ppm / 8-hour	0.070 ppm, / 8-hour	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage.
Carbon Monoxide (CO)	20.0 ppm / 1-hour 9.0 ppm / 8-hour	35.0 ppm / 1-hour 9.0 ppm / 8-hour	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO_2)	0.18 ppm / 1-hour 0.030 ppm / annual	100 ppb / 1-hour 0.053 ppm / annual	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO_2)	0.25 ppm / 1-hour 0.04 ppm / 24-hour	75 ppb / 1-hour 0.14 ppm/annual	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM_{10})	50 µg/m^3 / 24-hour 20 µg/m^3 / annual	150 µg/m^3 / 24-hour	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in elderly.
Suspended Particulate Matter ($PM_{2.5}$)	12 µg/m^3 / annual	35 µg/m^3 / 24-hour 12 µg/m^3 / annual	
Sulfates	25 µg/m^3 / 24-hour	No Federal Standards	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and (f) Property damage.
Lead	1.5 µg/m^3 / 30-day	0.15 µg/m^3 /3-month rolling	(a) Learning disabilities; and (b) Impairment of blood formation and nerve conduction.
Visibility Reducing Particles	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more due to particles when relative humidity is less than 70 percent.	No Federal Standards	Visibility impairment on days when relative humidity is less than 70 percent.

Source: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf .

As part of its enforcement responsibilities, the EPA requires each state with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the national standards. The SIP must integrate federal, state, and local components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based

programs within the timeframe identified in the SIP. The CARB defines attainment as the category given to an area with no violations in the past three years. As indicated below in Table C, the Air Basin has been designated by EPA for the national standards as a non-attainment area for ozone (O_3) and suspended particulates (PM10 and PM2.5) and partial non-attainment for lead. Currently, the Air Basin is in attainment with the national ambient air quality standards for carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2).

Table C – South Coast Air Basin Attainment Status

Criteria Pollutant	Standard	Averaging Time	Designation[a)]	Attainment Date[b)]
1-Hour Ozone	NAAQS	1979 1-Hour (0.12 ppm)	Nonattainment (Extreme)	2/6/2023 Originally 11/15/2010 (not attained)[c)]
	CAAQS	1-Hour (0.09 ppm)	Nonattainment	N/A
8-Hour Ozone[d)]	NAAQS	1997 8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
	NAAQS	2008 8-Hour (0.075 ppm)	Nonattainment (Extreme)	7/20/2032
	NAAQS	2015 8-Hour (0.070 ppm)	Designations Pending	~2037
	CAAQS	8-Hour (0.070 ppm)	Nonattainment	Beyond 2032
CO	NAAQS	1-Hour (35 ppm) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
	CAAQS	1-Hour (20 ppm) 8-Hour (9 ppm)	Attainment	6/11/2007 (attained)
NO_2[e)]	NAAQS	1-Hour (0.10 ppm)	Unclassifiable/ Attainment	N/A (attained)
	NAAQS	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
	CAAQS	1-Hour (0.18 ppm) Annual (0.030 ppm)	Attainment	---
SO_2[f)]	NAAQS	1-Hour (75 ppb)	Designations Pending (expect Unclassifiable/ Attainment)	N/A (attained)
	NAAQS	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/ Attainment	3/19/1979 (attained)
PM10	NAAQS	1987 24-hour (150 µg/m^3)	Attainment (Maintenance)[g)]	7/26/2013 (attained)
	CAAQS	24-hour (50 µg/m^3) Annual (20 µg/m^3)	Nonattainment	N/A
PM2.5[h)]	NAAQS	2006 24-Hour (35 µg/m^3)	Nonattainment (Serious)	12/31/2019
	NAAQS	1997 Annual (15.0 µg/m^3)	Nonattainment	4/5/2015
	NAAQS	2012 Annual (12.0 µg/m^3)	Nonattainment (Serious)	12/31/2025
	CAAQS	Annual (12.0 µg/m^3)	Nonattainment	N/A
Lead	NAAQS	3-Months Rolling (0.15 µg/m^3)	Nonattainment (Partial)	12/31/2015

Source: SCAQMD, February 2016
Notes:
a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable
b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration
c) 1-hour O_3 standard (0.12 ppm) was revoked, effective June 15, 2005; however, the Basin has not attained this standard based on 2008-2010 data and is still subject to anti-backsliding requirements

d) 1997 8-hour O_3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the revoked 1997 O_3 standard is still subject to anti-backsliding requirements
e) New NO_2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO2 standard retained
f) The 1971 annual and 24-hour SO_2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard. Area designations are still pending, with Basin expected to be designated Unclassifiable /Attainment.
g) Annual PM10 standard was revoked, effective December 18, 2006; 24-hour PM10 NAAQS deadline was 12/31/2006; SCAQMD request for attainment redesignation and PM10 maintenance plan was approved by U.S. EPA on June 26, 2013, effective July 26, 2013.
h) Attainment deadline for the 2006 24-Hour PM2.5 NAAQS (designation effective December 14, 2009) is December 31, 2019 (end of the 10th calendar year after effective date of designations for Serious nonattainment areas). Annual PM2.5 standard was revised on January 15, 2013, effective March 18, 2013, from 15 to 12 $\mu g/m^3$. Designations effective April 15, 2015, so Serious area attainment deadline is December 31, 2025.
i) Partial Nonattainment designation – Los Angeles County portion of Basin only for near-source monitors. Expect to remain in attainment based on current monitoring data.

In 2011, the Air Basin exceeded federal standards for either ozone or PM2.5 at one or more locations on a total of 124 days, based on the current federal standards for 8-hour ozone and 24-hour PM2.5. Despite substantial improvements in air quality over the past few decades, some air monitoring stations in the Air Basin still exceed the NAAQS for ozone more frequently than any other stations in the U.S. In 2011, three of the top five stations that exceeded the 8-hour ozone NAAQS were located in the Air Basin (Central San Bernardino Mountains, East San Bernardino Valley, and Metropolitan Riverside County). (SCAQMD 2012)

PM2.5 in the Air Basin has improved significantly in recent years, with 2010 and 2011 being the cleanest years on record. In 2011, only one station in the Air Basin (Metropolitan Riverside County at Mira Loma) exceeded the annual PM2.5 NAAQS and the 98th percentile form of the 24-hour PM2.5 NAAQS, as well as the 3-year design values for these standards. Basin-wide, the federal PM2.5 24-hour standard level was exceeded in 2011 on 17 sampling days. (SCAQMD 2012)

The Air Basin is currently in attainment for the federal standards for NO_2. While the concentration level of the new 1-hour NO_2 federal standard (100 ppb) was exceeded in the Air Basin at two stations (Central Los Angeles and Long Beach) on the same day in 2011, the NAAQS NO_2 design value has not been exceeded. (SCAQMD 2012) Therefore, the Basin remains in attainment of the NO_2 NAAQS.

Although much of the South Coast Air Basin, including the proposed site location of Riverside County, is in attainment for lead, the EPA designated the Los Angeles County portion of the Air Basin as nonattainment for the revised (2008) federal lead standard (0.15 $\mu g/m^3$, rolling 3-month average). This was due to the addition of source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in Vernon and the City of Industry exceeding the revised standard in the 2007-2009 period of data used. As of the 2009-2011 data period, only one of these stations (Vernon) still exceeded the lead standard. The *2012 Lead State Implementation Plan Los Angeles County*, prepared by SCAQMD and adopted on May 4, 2012, provided measures to meet attainment of lead by December 31, 2015. Current monitoring data shows that lead is now below the standards at all monitoring stations, however it will take three years of meeting the standards before Los Angeles County can request to be re-designated by the EPA.

In Massachusetts v. Environmental Protection Agency (Docket No. 05–1120), argued November 29, 2006 and decided April 2, 2007, the U.S. Supreme Court held that not only did the EPA have authority to regulate greenhouse gases, but the EPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the EPA should be required to regulate CO_2 and other greenhouse gases as pollutants under the federal Clean Air Act (CAA).

In response to the FY2008 Consolidations Appropriations Act (H.R. 2764; Public Law 110-161), EPA proposed a rule on March 10, 2009 that requires mandatory reporting of GHG emissions from large sources in the United States. On September 22, 2009, the Final Mandatory Reporting of GHG Rule was

signed and published in the Federal Register on October 30, 2009. The rule became effective on December 29, 2009. This rule requires suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions to submit annual reports to EPA.

On December 7, 2009, the EPA Administrator signed two distinct findings under section 202(a) of the Clean Air Act. One is an endangerment finding that finds concentrations of the six GHGs in the atmosphere threaten the public health and welfare of current and future generations. The other is a cause or contribute finding, that finds emissions from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare. These actions did not impose any requirements on industry or other entities, however, since 2009 the EPA has been providing GHG emission standards for vehicles and other stationary sources of GHG emissions that are regulated by the EPA. On September 13, 2013 the EPA Administrator signed 40 CFR Part 60, that limits emissions from new sources to 1,100 pounds of CO_2 per MWh for fossil fuel-fired utility boilers and 1,000 pounds of CO_2 per MWh for large natural gas-fired combustion units.

On August 3, 2015, the EPA announced the Clean Power Plan, emissions guidelines for U.S. states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired power plants (Federal Register Vol. 80, No. 205, October 23 2015). On February 9, 2016 the Supreme Court stayed implementation of the Clean Power Plan due to a legal challenge from 29 states and in April 2017, the Supreme Court put the case on hold and directed both sides to make arguments for whether it should keep the case on hold indefinitely or close it and remand the issue to the EPA. On August 21, 2018 the EPA released the Affordable Clean Energy Rule, which usurps the Clean Power plan and returns most of the decision making authority for power plant emissions back to the States.

State – California Air Resources Board

The California Air Resources Board (CARB), which is a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. The CAAQS for criteria pollutants are shown above in Table B. In addition, the CARB establishes emission standards for motor vehicles sold in California, consumer products (e.g. hairspray, aerosol paints, and barbeque lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

The Air Basin has been designated by the CARB as a non-attainment area for ozone, PM10, PM2.5 and lead. Currently, the South Coast Air Basin is in attainment with the ambient air quality standards for CO, NO_2, SO_2, and sulfates and is unclassified for visibility reducing particles and Hydrogen Sulfide.

In 2008 the CARB adopted Resolution 08-43, which limits NOx, PM10 and PM2.5 emissions from on-road diesel truck fleets that operate in California. In 2009 Executive Order R-09-010 was adopted that codified Resolution 08-43 into Section 2025, title 13 of the California Code of Regulations. This regulation requires that by the year 2023 all commercial diesel trucks that operate in California shall meet model year 2010 (Tier 4 Final) or latter emission standards. In the interim period, this regulation provides annual interim targets for fleet owners to meet. This regulation also provides a few exemptions including a onetime per year 3-day pass for trucks registered outside of California.

CARB is also responsible for regulations pertaining to Toxic Air Contaminants (TACs). The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588, 1987, Connelly) was enacted in

1987 as a means to establish a formal air toxics emission inventory risk quantification program. AB 2588, as amended, establishes a process that requires stationary sources to report the type and quantities of certain substances their facilities routinely release in California. The data is ranked by high, intermediate, and low categories, which are determined by: the potency, toxicity, quantity, volume, and proximity of the facility to nearby receptors.

CARB also proposed interim statewide CEQA thresholds for GHG emissions and released *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act,* on October 24, 2008 that has been utilized by the SCAQMD's GHG Significance Threshold Stakeholder Working Group in their framework for developing SCAQMD's draft GHG emissions thresholds. The State currently has no regulations that establish ambient air quality standards for GHGs. However, the State has passed laws directing CARB to develop actions to reduce GHG emissions, which are listed below.

Executive Order B-30-15, Senate Bill 32 and Assembly Bill 197

The California Governor issued Executive Order B-30-15 on April 29, 2015 that aims to reduce California's GHG emissions 40 percent below 1990 levels by 2030. This executive order aligns California's GHG reduction targets with those of other international governments, such as the European Union that set the same target for 2030 in October, 2014. This target will make it possible to reach the ultimate goal of reducing GHG emissions 80 percent under 1990 levels by 2050 that is based on scientifically established levels needed in the U.S.A to limit global warming below 2 degrees Celsius – the warming threshold at which scientists say there will likely be major climate disruptions such as super droughts and rising sea levels. Assembly Bill 197 (AB 197) (September 8, 2016) and Senate Bill 32 (SB 32) (September 8, 2016) codified into statute the GHG emissions reduction targets of at least 40 percent below 1990 levels by 2030 as detailed in EO B-30-15. AB 197 also requires additional GHG emissions reporting that is broken down to sub-county levels and requires CARB to consider the social costs of emissions impacting disadvantaged communities.

Executive Order B-29-15

The California Governor issued Executive Order B-29-15 on April 1, 2015 and directed the State Water Resources Control Board to impose restrictions to achieve a statewide 25% reduction in urban water usage and directed the Department of Water Resources to replace 50 million square feet of lawn with drought tolerant landscaping through an update to the State's Model Water Efficient Landscape Ordinance. The Ordinance also requires installation of more efficient irrigation systems, promotion of greywater usage and onsite stormwater capture, and limits the turf planted in new residential landscapes to 25 percent of the total area and restricts turf from being planted in median strips or in parkways unless the parkway is next to a parking strip and a flat surface is required to enter and exit vehicles. Executive Order B-29-15 would reduce GHG emissions associated with the energy used to transport and filter water.

Assembly Bill 1109

California Assembly Bill 1109 (AB 1109), which also known as the Lighting Efficiency and Toxics Reduction Act, prohibits the manufacturing of lights after January 1, 2010 that contain levels of hazardous substances prohibited by the European Union pursuant to the RoHS Directive. AB 1109 also requires reductions in energy usage for lighting and is structured to reduce lighting electrical consumption by: (1) At least 50 percent reduction from 2007 levels for indoor residential lighting; and (2) At least 25 percent reduction from 2007 levels for indoor commercial and all outdoor lighting by 2018. AB 1109 would reduce GHG emissions through reducing the amount of electricity required to be generated by fossil fuels in California.

Assembly Bill 1493

California Assembly Bill 1493 (also known as the Pavley Bill, in reference to its author Fran Pavley) was enacted on July 22, 2002 and required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. In 2004, CARB approved the "Pavley I" regulations limiting the amount of GHGs that may be released from new passenger automobiles that are being phased in between model years 2009 through 2016. These regulations will reduce GHG emissions by 30 percent from 2002 levels by 2016. The second set of regulations "Pavley II" is currently in development and will be phased in between model years 2017 through 2025 and will reduce emissions by 45 percent by the year 2020 as compared to the 2002 fleet. The Pavley II standards are being developed by linking the GHG emissions and formerly separate toxic tailpipe emissions standards previously known as the "LEV III" (third stage of the Low Emission Vehicle standards) into a single regulatory framework. The new rules reduce emissions from gasoline-powered cars as well as promote zero-emissions auto technologies such as electricity and hydrogen, and through increasing the infrastructure for fueling hydrogen vehicles. In 2009, the U.S. EPA granted California the authority to implement the GHG standards for passenger cars, pickup trucks and sport utility vehicles. In September 2009, the Pavley I regulations were adopted by CARB.

Executive Order S-3-05

In 2005 the California Governor issued Executive Order S 3-05, GHG Emission, which established the following reduction targets:

- 2010: Reduce greenhouse gas emissions to 2000 levels;
- 2020: Reduce greenhouse gas emissions to 1990 levels;
- 2050: Reduce greenhouse gas emissions to 80 percent below 1990 levels.

The executive order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. To comply with the Executive Order, the secretary of CalEPA created the California Climate Action Team (CAT), made up of members from various state agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of businesses, local governments, and communities and through State incentive and regulatory programs. The State achieved its first goal of reducing greenhouse gas emissions to 2000 levels by 2010.

Assembly Bill 32

In 2006, the California State Legislature adopted Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006. AB 32 requires CARB, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020 through an enforceable statewide emission cap which will be phased in starting in 2012. Emission reductions shall include carbon sequestration projects that would remove carbon from the atmosphere and utilize best management practices that are technologically feasible and cost effective.

In 2007 CARB released the calculated Year 1990 GHG emissions of 431 million metric tons of CO2e ($MMTCO_2e$). The 2020 target of 431 $MMTCO_2e$ requires the reduction of 78 $MMTCO_2e$, or approximately 16 percent from the State's projected 2020 business as usual emissions of 509 $MMTCO_2e$ (CARB, 2014). Under AB 32, CARB was required to adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 cap by 2020. Early measures CARB took to lower GHG emissions included requiring operators of the largest industrial facilities that emit 25,000 metric tons of CO_2 in a calendar year to submit verification of GHG emissions by December 1, 2010. The CARB Board also approved nine discrete early action measures that include regulations affecting landfills, motor vehicle

fuels, refrigerants in cars, port operations and other sources, all of which became enforceable on or before January 1, 2010.

CARB's Scoping Plan that was adopted in 2009, proposes a variety of measures including: strengthening energy efficiency and building standards; targeted fees on water and energy use; a market-based cap-and-trade system; achieving a 33 percent renewable energy mix; and a fee regulation to fund the program. The 2014 update to the Scoping Plan identifies strategies moving beyond the 2020 targets to the year 2050. The California's 2017 Climate Change Scoping Plan that was adopted in November 2017, is the second update to the Scoping Plan and provides specific statewide policies and measures to achieve the 2030 GHG reduction targets adopted in AB 197 and SB 32 as well as the aspirational 2050 reduction target provided in Executive Order B-30-15.

The Cap and Trade Program established under the Scoping Plan sets a statewide limit on sources responsible for 85 percent of California's GHG emissions, and has established a market for long-term investment in energy efficiency and cleaner fuels since 2012.

Senate Bill 1368

Senate Bill 1368 (SB 1368) is the companion Bill of AB 32 and was adopted September 2006. SB 1368 requires that the California Public Utilities Commission (CPUC) establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007 and for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas-fired plant. Furthermore, the legislation states that all electricity provided to the State, including imported electricity, must be generated by plants that meet the standards set by CPUC and California Energy Commission (CEC).

Executive Order S-1-07

Executive Order S-1-07 was issued in 2007 and proclaims that the transportation sector is the main source of GHG emissions in the State, since it generates more than 40 percent of the State's GHG emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in the State by at least ten percent by 2020. This Order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

In 2009 CARB approved the proposed regulation to implement the low carbon fuel standard. The standard was challenged in the courts, but has been in effect since 2011 and was re-approved by the CARB in 2015. The low carbon fuel standard is anticipated to reduce GHG emissions by about 16 MMT per year by 2020. The low carbon fuel standard is designed to provide a framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet annually. Reformulated gasoline mixed with corn-derived ethanol and low-sulfur diesel fuel represent the baseline fuels. Lower carbon fuels may be ethanol, biodiesel, renewable diesel, or blends of these fuels with gasoline or diesel. Compressed natural gas and liquefied natural gas also may be low-carbon fuels. Hydrogen and electricity, when used in fuel cells or electric vehicles, are also considered as low-carbon fuels.

Senate Bill 97

Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG

emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify and adopt those guidelines by January 1, 2010.

Pursuant to the requirements of SB 97 as stated above, on December 30, 2009 the Natural Resources Agency adopted amendments to the State CEQA guidelines that address GHG emissions. The CEQA Guidelines Amendments changed 14 sections of the CEQA Guidelines and incorporated GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance were provided and no specific mitigation measures were identified. The GHG emission reduction amendments went into effect on March 18, 2010 and are summarized below:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

Senate Bill 350

Senate Bill 350 (SB 350) was adopted October 2015 in order to implement the goals of Executive Order B-30-15. SB 350 increases the State's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. In addition SB 350 requires the State to double statewide energy efficiency savings for both electricity and natural gas uses by 2030. SB 350 is being implemented by requiring all large utilities to develop and submit Integrated Resource Plans that detail how they will meet their customers energy needs, reduce GHG emissions and deploy clean energy resources. SB 350 superseded the renewable energy requirements set by SB 1078, SB 107, and SB X1-2.

Senate Bill 375

Senate Bill 375 (SB 375) was adopted September 2008 in order to support the State's climate action goals to reduce GHG emissions through coordinated regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires CARB to set regional

targets for GHG emissions reductions from passenger vehicle use. In 2010, CARB established targets for 2020 and 2035 for each Metropolitan Planning Organizations (MPO) within the State. It was up to each MPO to adopt a sustainable communities strategy (SCS) that will prescribe land use allocation in that MPOs Regional Transportation Plan (RTP) to meet CARB's 2020 and 2035 GHG emission reduction targets. These reduction targets are required to be updated every eight years and in June 2017 CARB released *Staff Report Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Target*, which provides recommended GHG emissions reduction targets for SCAG of 8 percent by 2020 and 21 percent by 2035.

The *2016-2040 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS), adopted by SCAG April, 2016 provides a 2020 GHG emission reduction target of 8 percent and a 2035 GHG emission reduction target of 18 percent. SCAG will need to develop additional strategies in its next revision of the RTP/SCS in order to meet CARB's new 21 percent GHG emission reduction target for 2035. CARB is also charged with reviewing SCAG's RTP/SCS for consistency with its assigned targets.

City and County land use policies, including General Plans, are not required to be consistent with the RTP and associated SCS. However, new provisions of CEQA incentivize, through streamlining and other provisions, qualified projects that are consistent with an approved SCS and categorized as "transit priority projects."

Assembly Bill 341 and Senate Bills 939 and 1374

Senate Bill 939 (SB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board to adopt a model ordinance by March 1, 2004 suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills. Assembly Bill 341 (AB 341) was adopted in 2011 and builds upon the waste reduction measures of SB 939 and 1374, and sets a new target of a 75 percent reduction in solid waste generated by the year 2020.

California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

Title 24 standards are updated on a three-year schedule and the most current 2016 standards went into effect on January 1, 2017. The Title 24 standards require the installation of insulated hot water pipes, improved window performance, improved wall insulation, and mandatory duct sealing. Title 24 also requires roofs to be constructed to be solar ready, with cool roofing shingles, a minimum 1-inch air space between roof material and roof deck, and a minimum of R-22 roof/ceiling insulation. All lighting is required to be high efficiency and daylight sensors and motion sensors are required for outdoor lighting, bathrooms, utility rooms and other spaces. The forced air systems are required to limit leakage to 5 percent or less and requires all heat pump systems to be equipped with liquid line filter driers. The 2016 Title 24 Part 6 standards are anticipated to reduce electricity consumption by 281 gigawatt-hours per year and natural gas consumption by 16 million therms per year (http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf).

California Code of Regulations (CCR) Title 24, Part 11

CCR Title 24, Part 11: *California Green Building Standards* (Title 24) was developed in response to continued efforts to reduce GHG emissions associated with energy consumption. The most current version is the 2016 California Green Building Standards Code (CalGreen), which became effective on January 1, 2017 and replaced the 2013 CalGreen.

The CALGreen Code contains requirements for construction site selection; storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for verifying that all building systems (e.g., heating and cooling equipment and lighting systems) are functioning at their maximum efficiency.

The CALGreen Code provides standards for bicycle parking, carpool/vanpool/electric vehicle spaces, light and glare reduction, grading and paving, energy efficient appliances, renewable energy, graywater systems, water efficient plumbing fixtures, recycling and recycled materials, pollutant controls (including moisture control and indoor air quality), acoustical controls, storm water management, building design, insulation, flooring, and framing, among others. Implementation of the CALGreen Code measures reduces energy consumption and vehicle trips and encourages the use of alternative-fuel vehicles, which reduces pollutant emissions.

Some of the notable changes in the 2016 CALGreen Code over the prior 2013 CALGreen Code include: an increase in amount of bicycle parking requirements; an increase in number of EV charging stations and clean air vehicle parking at non-residential buildings; a reduction in water usage in urinals to 0.125 gallons per flush; an increased rate of diversion for construction and operational waste to 65 percent as well as adding organic waste as waste to be diverted; and a requirement for fireplaces to meet new EPA standards.

Regional

The SCAQMD is the agency principally responsible for comprehensive air pollution control in the South Coast Air Basin. To that end, as a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), county transportation commissions, and local governments and cooperates actively with all federal and state agencies.

South Coast Air Quality Management District

SCAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emission sources, and enforces such measures through educational programs or fines, when necessary. SCAQMD is directly responsible for reducing emissions from stationary, mobile, and indirect sources. It has responded to this requirement by preparing a sequence of AQMPs. The *Final 2016 Air Quality Management Plan* (2016 AQMP) was adopted by the SCAQMD Board on March 3, 2016 and was adopted by CARB on March 23, 2017 for inclusion into the California State Implementation Plan (SIP). The 2016 AQMP was prepared in order to meet the following standards:

- 8-hour Ozone (75 ppb) by 2032
- Annual PM2.5 (12 µg/m3) by 2021-2025
- 8-hour Ozone (80 ppb) by 2024 (updated from the 2007 and 2012 AQMPs)
- 1-hour Ozone (120 ppb) by 2023 (updated from the 2012 AQMP)
- 24-hour PM2.5 (35 µg/m3) by 2019 (updated from the 2012 AQMP)

In addition to meeting the above standards, the 2016 AQMP also includes revisions to the attainment demonstrations for the 1997 8-hour ozone NAAQS and the 1979 1-hour ozone NAAQS. The prior 2012 AQMP was prepared in order to demonstrate attainment with the 24-hour PM2.5 standard by 2014 through adoption of all feasible measures. The prior 2007 AQMP demonstrated attainment with the 1997 8-hour ozone (80 ppb) standard by 2023, through implementation of future improvements in control techniques and technologies. These "black box" emissions reductions represent 65 percent of the remaining NOx emission reductions by 2023 in order to show attainment with the 1997 8-hour ozone NAAQS. Given the magnitude of these needed emissions reductions, additional NOx control measures have been provided in the 2012 AQMP even though the primary purpose was to show compliance with 24-hour PM2.5 emissions standards.

The 2016 AQMP provides a new approach that focuses on available, proven and cost effective alternatives to traditional strategies, while seeking to achieve multiple goals in partnership with other entities to promote reductions in GHG emissions and TAC emissions as well as efficiencies in energy use, transportation, and goods movement. The 2016 AQMP recognizes the critical importance of working with other agencies to develop funding and other incentives that encourage the accelerated transition of vehicles, buildings and industrial facilities to cleaner technologies in a manner that benefits not only air quality, but also local businesses and the regional economy.

Although SCAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate air quality issues associated with plans and new development projects throughout the Air Basin. Instead, this is controlled through local jurisdictions in accordance to the California Environmental Quality Act (CEQA). In order to assist local jurisdictions with air quality compliance issues the *CEQA Air Quality Handbook* (SCAQMD CEQA Handbook), prepared by SCAQMD, 1993, with the most current updates found at http://www.aqmd.gov/ceqa/hdbk.html, was developed in accordance with the projections and programs detailed in the AQMPs. The purpose of the SCAQMD CEQA Handbook is to assist Lead Agencies, as well as consultants, project proponents, and other interested parties in evaluating a proposed project's potential air quality impacts. Specifically, the SCAQMD CEQA Handbook explains the procedures that SCAQMD recommends be followed for the environmental review process required by CEQA. The SCAQMD CEQA Handbook provides direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. The SCAQMD intends that by providing this guidance, the air quality impacts of plans and development proposals will be analyzed accurately and consistently throughout the Air Basin, and adverse impacts will be minimized.

SCAQMD Working Group

Since neither CARB nor the OPR has developed GHG emissions threshold, the SCAQMD formed a Working Group to develop significance thresholds related to GHG emissions. At the September 28, 2010 Working Group meeting, the SCAQMD released its most current version of the draft GHG emissions thresholds, which recommends a tiered approach that either provides a quantitative annual thresholds of 3,500 $MTCO_2e$ for residential uses, 1,400 $MTCO_2e$ for commercial uses, and 3,000 $MTCO_2e$ for mixed uses. An alternative annual threshold of 3,000 $MTCO_2e$ for all land use types is also proposed.

Southern California Association of Governments

The SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development and the environment. SCAG is the federally designated Metropolitan Planning Organization (MPO) for the majority of the southern California region and is the largest MPO in the nation. With respect to air quality planning, SCAG has prepared the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), adopted April, 2016 and the *2015 Federal*

Transportation Improvement Program (FTIP), adopted October 2013, which addresses regional development and growth forecasts. Although the RTP/SCS and FTIP are primarily planning documents for future transportation projects a key component of these plans are to integrate land use planning with transportation planning that promotes higher density infill development in close proximity to existing transit service. These plans form the basis for the land use and transportation components of the AQMP, which are utilized in the preparation of air quality forecasts and in the consistency analysis included in the AQMP. The RTP/SCS, FTIP, and AQMP are based on projections originating within the City and County General Plans.

Local – City of Lake Elsinore

Local jurisdictions, such as the County of Riverside, have the authority and responsibility to reduce air pollution through its police power and decision-making authority. Specifically, the City is responsible for the assessment and mitigation of air emissions resulting from its land use decisions. The City is also responsible for the implementation of transportation control measures as outlined in the 2007 AQMP and 2012 AQMP. Examples of such measures include bus turnouts, energy-efficient streetlights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation.

In accordance with the CEQA requirements, the City does not, however, have the expertise to develop plans, programs, procedures, and methodologies to ensure that air quality within the City and region will meet federal and state standards. Instead, the City relies on the expertise of the SCAQMD and utilizes the SCAQMD CEQA Handbook as the guidance document for the environmental review of plans and development proposals within its jurisdiction.

The City of Lake Elsinore General Plan contains the following air quality-related goals and policies that are applicable to the proposed project:

Goal 2 Work with regional and state governments to develop effective mitigation measures to improve air quality.

Policy 2.1 Support the SCAQMD in its development of improved ambient air quality monitoring capabilities and establishment of standards, thresholds, and rules to address, and where necessary mitigate, the air quality impacts of new development.

4.0 ATMOSPHERIC SETTING

4.1 Regional – Western Riverside County

The project site is located within the western portion of Riverside County, which is part of the South Coast Air Basin (Air Basin) that includes the non-desert portions of Riverside, San Bernardino, and Los Angeles Counties and all of all of Orange County. Temperature inversions are the prime factor in the accumulation of contaminants in the Air Basin. The mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds. The topography and climate of Southern California combine to create an area of high air pollution potential in the Air Basin. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cup over the cool marine layer, which prevents pollution from dispersing upward. This inversion allows pollutants to accumulate within the lower layer. Light winds during the summer further limit ventilation from occurring.

Due to the low average wind speeds in the summer and a persistent daytime temperature inversion, emissions of hydrocarbons and oxides of nitrogen have an opportunity to combine with sunlight in a complex series of reactions. These reactions produce a photochemical oxidant commonly known as smog. Since the Air Basin experiences more days of sunlight than any other major urban area in the United States, except Phoenix, the smog potential in the region is higher than in most other areas of the nation.

4.2 Local – Lake Elsinore

The major factors affecting local air pollution conditions in the Lake Elsinore planning area are the extent and types of both region-wide and local emissions, climate, and meteorology. The general climate of Lake Elsinore is characterized by sparse winter rainfall and hot summers tempered by cool ocean breezes. The climate in and around Lake Elsinore, as well as most of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. This high-pressure cell produces a typical Mediterranean climate with warm summers, mild winters, and moderate rainfall. This pattern is infrequently interrupted by periods of extremely hot weather brought in by Santa Ana winds. Most of the area's precipitation occurs intermittently between November and April; the area is still dominated by sunny or partly sunny conditions during these months. Cyclic land and sea breezes are the primary factors affecting the region's mild climate. The daytime winds are normally sea breezes, predominantly from the west, that flow at relatively low velocities.

Just south of Lake Elsinore, the Lake Elsinore Convergence Zone acts as an invisible boundary that obstructs much of the inland basin air pollutants from continuing south beyond the Lake Elsinore area. Coastal winds within the Lake Elsinore Convergence Zone are a primary factor for the obstruction. They allow air pollutants to be dispersed just south of the convergence zone and accumulate within the Lake Elsinore area, including surrounding communities to the north and east.

The temperature and precipitation levels for Lake Elsinore is shown below in Table D and is based on the average of data from March 10, 1897 to January 20, 2015. Table D shows that August is typically the warmest month and January is typically the coolest month. Rainfall in the project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers being almost completely dry.

Table D – Monthly Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Max. Temperature	65.4	67.5	71.0	76.3	81.8	90.5	98.1	98.1	93.5	83.7	74.1	66.9
Average Min. Temperature	36.4	38.7	41.2	44.7	49.8	54.1	59.4	59.8	55.8	48.8	41.1	36.5
Average Total Precipitation (in.)	2.47	2.54	2.03	0.75	0.23	0.02	0.08	0.12	0.26	0.51	0.99	2.01

Source: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca2805

4.3 Monitored Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the Air Basin. Estimates of the existing emissions in the Air Basin provided in the 2012 AQMP, indicate that collectively, mobile sources account for 59 percent of the VOC, 88 percent of the NOx emissions and 40 percent of directly emitted PM2.5, with another 10 percent of PM2.5 from road dust.

SCAQMD has divided the Air Basin into 38 air-monitoring areas. The project site is located in Air Monitoring Area 25, which covers Lake Elsinore. The nearest air monitoring station to the project site is the is the Lake Elsinore-West Flint Street Monitoring Station (Lake Elsinore Station), which is located approximately 1.6 miles southeast of the project site at 506 West Flint Street, Lake Elsinore. However, it should be noted that due to the air monitoring station's distance from the project site, recorded air pollution levels at the Lake Elsinore Station reflect with varying degrees of accuracy, local air quality conditions at the project site. It should also be noted that CO measurements have not been provided, since CO is currently in attainment in the Air Basin and monitoring of CO within the Air Basin ended on March 31, 2013.

The monitoring data from the Lake Elsinore Station is presented in Table E and shows the most recent three years of monitoring data from CARB. Table E shows that ozone and particulate matter (PM10 and PM2.5) are the air pollutants of primary concern in the project area, which are detailed below:

Ozone

The State 1-hour concentration standard for ozone has been exceeded between 4 and 18 days each year over the past three years at the Lake Elsinore Station. The State 8-hour ozone standard has been exceeded between 13 and 44 days each year over the past three years at the Lake Elsinore Station. The Federal 8-hour ozone standard has been exceeded between 13 and 35 days each year over the past three years at the Lake Elsinore Station.

Ozone is a secondary pollutant as it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO_2, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Many areas of Southern California contribute to the ozone levels experienced at this monitoring station, with the more significant areas being those directly upwind.

Nitrogen Dioxide

The Lake Elsinore Station did not record an exceedance of the Federal 1-hour NO_2 standard for the last three years.

Table E – Local Area Air Quality Monitoring Summary

Pollutant (Standard)	Year[1] 2014	2015	2016
Ozone:			
Maximum 1-Hour Concentration (ppm)	0.104	0.131	0.124
Days > CAAQS (0.09 ppm)	**4**	**18**	**15**
Maximum 8-Hour Concentration (ppm)	0.087	0.099	0.094
Days > NAAQS (0.070 ppm)	**13**	**31**	**44**
Days > CAAQs (0.070 ppm)	**13**	**35**	**45**
Nitrogen Dioxide:			
Maximum 1-Hour Concentration (ppb)	45.3	47.2	51.3
Days > NAAQS (100 ppb)	0	0	0
Inhalable Particulates (PM10):			
Maximum 24-Hour California Measurement (ug/m^3)	86.8	90.7	65.4
Days > NAAQS (150 ug/m^3)	0	0	0
Days > CAAQS (50 ug/m^3)	ND	ND	ND
Annual Arithmetic Mean (AAM) (ug/m^3)	26.0	20.1	20.2
Annual > NAAQS (50 ug/m^3)	No	No	No
Annual > CAAQS (20 ug/m^3)	**Yes**	**Yes**	**Yes**
Ultra-Fine Particulates (PM2.5):			
Maximum 24-Hour National Measurement (ug/m^3)	33.7	42.2	26.2
Days > NAAQS (35 ug/m^3)	ND	ND	ND
Annual Arithmetic Mean (AAM) (ug/m^3)	11.8	ND	ND
Annual > NAAQS and CAAQS (12 ug/m^3)	No	ND	ND

Notes: Exceedances are listed in **bold.** CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million; ppb = parts per billion; ND = no data available.
[1] Data obtained from the Lake Elsinore Station.
Source: http://www.arb.ca.gov/adam/

Particulate Matter

It is not clear whether the State 24-hour concentration standard for PM10 has been exceeded as there is no data for the last three years at the Lake Elsinore Station. Over the past three years the Federal 24-hour standard for PM10 has not been exceeded at the Lake Elsinore Station. The annual PM10 concentration at the Lake Elsinore Station has exceeded the State standard for the past three years and has not exceeded the Federal standard for the past three years.

Over the past three years there has been no data for the 24-hour concentration standard for PM2.5 at the Lake Elsinore Station. The annual PM2.5 concentration at the Lake Elsinore Station has not exceeded the State or Federal standard for the past three years. There does not appear to be a noticeable trend for PM10 or PM2.5 in either maximum particulate concentrations or days of exceedances in the area. Particulate levels in the area are due to natural sources, grading operations, and motor vehicles.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM10 and PM2.5). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths during exercise.

4.4 Toxic Air Contaminant Levels in the Air Basin

In order to determine the Air Basin-wide risks associated with major airborne carcinogens, the SCAQMD conducted the Multiple Air Toxics Exposure Study (MATES) studies. According to the SCAQMD's MATES-IV study, the project site has an estimated cancer risk of 422 per million persons chance of cancer. In comparison, the average cancer risk for the Air Basin is 991 per million persons, which is based on the use of age-sensitivity factors detailed in the OEHHA Guidelines (OEHHA, 2015).

In order to provide a perspective of risk, it is often estimated that the incidence in cancer over a lifetime for the U.S. population ranges between 1 in 3 to 4 and 1 in 3, or a risk of about 300,000 per million persons. The MATES-III study referenced a Harvard Report on Cancer Prevention, which estimated that of cancers associated with known risk factors, about 30 percent were related to tobacco, about 30 percent were related to diet and obesity, and about 2 percent were associated with environmental pollution related exposures that includes hazardous air pollutants.

5.0 MODELING PARAMETERS AND ASSUMPTIONS

5.1 CalEEMod Model Input Parameters

The criteria air pollution and GHG emissions impacts created by the proposed project have been analyzed through use of CalEEMod Version 2016.3.2. CalEEMod is a computer model published by the SCAQMD for estimating air pollutant emissions. The CalEEMod program uses the EMFAC2014 computer program to calculate the emission rates specific for South Coast Air Basin portion of Riverside County for employee, vendor and haul truck vehicle trips and the OFFROAD2011 computer program to calculate emission rates for heavy equipment operations. EMFAC2014 and OFFROAD2011 are computer programs generated by CARB that calculates composite emission rates for vehicles. Emission rates are reported by the program in grams per trip and grams per mile or grams per running hour.

The project characteristics in the CalEEMod were set to a project location of the South Coast Air Basin portion of Riverside County, a Climate Zone of 10, and utility company of Southern California Edison, and an opening year of 2020 was utilized in this analysis.

Land Use Parameters

The proposed project would consist of the development of an 18-vehicle fueling position gas station with two canopies that total 6,092 square feet, an 8,360 square foot convenience store (C-store), and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include multiple parking lots that have a total of 78 parking spaces. A summary of the proposed project's land use parameters entered into the CalEEMod model is shown in Table F.

Table F – CalEEMod Land Use Parameters

Proposed Land Use	Land Use Subtype in CalEEMod	Land Use Size[1]	Lot Acreage[2]	Building/Paving[3] (square feet)
Gas Station and C-Store	Gasoline/Service Station	18 VFP	0.60	14,452
Fast Food Drive Thru	Fast Food Restaurant with Drive Thru	2.543 TSF	0.24	2,543
Parking Lot	Parking Lot	78 PS	2.00	31,200

Notes:
[1] VFP = Vehicle Fueling Position, TSF = Thousand Square Foot, PS = Parking Space
[2] Lot acreage calculated based on a total lot acreage of 2.84 acres.
[3] Building/Paving square feet represent area where architectural coatings will be applied.

Construction Parameters

Construction activities are anticipated to start around Spring 2019 and take approximately a year to complete. The construction-related GHG emissions were based on a 30-year amortization rate as recommended in the SCAQMD GHG Working Group meeting on November 19, 2009. The phases of construction activities that have been analyzed are detailed below and include: 1) site preparation, 2) grading, 3) building construction, 4) paving, and 5) application of architectural coatings.

Site Preparation

The site preparation phase would consist of removing any vegetation, tree stumps, and stones onsite prior to grading. The site preparation phase is anticipated to start in Spring 2019 and was modeled as occurring over one week. The site preparation activities would require 8 worker trips per day. In order to account for water truck emissions, six vendor truck emissions were added to the site preparation phase. The onsite equipment would consist of one grader, one scraper, and either one tractor, loader, or backhoe, which is based on the CalEEMod default equipment mix. The mitigation of water all exposed areas three

times per day was chosen in order to account for the fugitive dust reduction that would occur through adhering to SCAQMD Rule 403, which requires that the Best Available Control Measures be utilized to reduce fugitive dust emissions.

Grading

The grading phase would occur after the completion of the site preparation phase and is anticipated to take approximately two weeks to complete. The proposed grading is balanced, which would result in no dirt being imported or exported from the project site. The onsite equipment would consist of one grader, one rubber tired dozer, and two tractors, loaders, or backhoes, which is based on the CalEEMod default equipment mix. The grading activities would require 10 worker trips per day. In order to account for water truck emissions, six daily vendor truck trips were added to the grading phase. The mitigation of water all exposed areas three times per day was chosen in order to account for the fugitive dust reduction that would occur through adhering to SCAQMD Rule 403, which requires that the Best Available Control Measures be utilized to reduce fugitive dust emissions.

Building Construction

The building construction would occur after the completion of the grading phase. The building construction phase was modeled based on occurring over approximately 10 months. The building construction would require up to 16 worker trips and 7 vendor trips per day. The onsite equipment would consist of the simultaneous operation of one crane, two forklifts, one generator set, three welders, and one tractor, loaders or backhoe, which is based on the CalEEMod default equipment mix.

Paving

The paving would occur after the completion of the building construction phase. The paving activities was modeled as occurring over two weeks and would require up to 15 worker trips per day. The onsite equipment would consist of the simultaneous operation of one cement and mortar mixer, one paver, one paving equipment, two rollers, and one tractor, loader, or backhoe, which is based on the CalEEMod default equipment mix.

Architectural Coating

The application of architectural coatings would occur after the completion of the paving phase. The architectural coating phase was modeled based on covering 25,493 square feet of nonresidential interior area, 8,498 feet of nonresidential exterior area, and 1,872 feet of parking area that includes striping of the parking lots and other architectural coatings in public areas. The architectural coating phase was modeled as occurring over two weeks and would require up to four worker trips per day. The onsite equipment would consist of one air compressor, which is based on the CalEEMod default equipment mix.

Operational Emissions Modeling

The operations-related criteria air pollutant emissions and GHG emissions created by the proposed project have been analyzed through use of the CalEEMod model. The proposed project was analyzed in the CalEEMod model based on the land use parameters provided above.

Mobile Sources

Mobile sources include emissions the additional vehicle miles generated from the proposed project. The vehicle trips associated with the proposed project have been analyzed through use of a trip rate of 496.12 daily trips per 1,000 square feet at the proposed fast food restaurant with a drive-thru window and a trip rate of 162.78 daily trips per vehicle fueling position at the proposed gas station and convenience store that were obtained from the *Traffic Impact Study Kassab Travel Center, City of Lake Elsinore* (Traffic

Impact Analysis), prepared by Dudek, August 2018. This resulted in the proposed fast food restaurant generating 1,260 trips per day and the proposed gas station and convenience store generating 2,930 trips per day, for a total of 4,190 trips generated by the proposed project per day.

The analysis accounted for the Riverside Transit Agency Collier FS Riverside Stop located at approximately 100 feet northeast of the project site on the corner of Collier Avenue and Riverside Drive. The analysis also accounted for Project Design Feature 1 that requires the installation of sidewalks along the project site boundary that is adjacent to Riverside Drive as well as internal sidewalks to connect to neighborhood activity centers along Collier Avenue and Project Design Feature 2 that requires the installation of a Class II bike lane along Riverside Drive. No other changes were made to the CalEEMod default mobile source parameters.

Area Sources

Area sources include emissions from consumer products, landscape equipment and architectural coatings. The area source emissions were based on the on-going use of the proposed project in the CalEEMod model. No changes were made to the default area source parameters in the CalEEMod model.

Energy Usage

Energy usage includes emissions from electricity and natural gas used onsite (excluding fireplaces). The energy usage was based on the ongoing use of the proposed project in the CalEEMod Model. No changes were made to the default energy usage parameters in the CalEEMod model.

The GHG analysis included implementation of Measure E-1.3 from the Climate Action Plan, which requires that all new construction exceed the 2008 Energy Efficiency Standards (Title 24 Standards) by 15 percent. It should be noted that the Title 24, Part 6 2016 Building Energy Efficiency Standards that became effective on January 1, 2017, result in an approximately 50 percent improvement to the year 2008 Title 24 building standards and the year 2016 Title 24 Part 6 standards are accounted for in the current CalEEMod model. In addition, the analysis included the CalEEMod mitigation of a 25 percent improvement in lighting efficiency in order to account for AB 1109 that requires a 25 percent reduction in energy usage for nonresidential lighting.

Solid Waste

Waste includes the GHG emissions associated with the processing of waste from the proposed project as well as the GHG emissions from the waste once it is interred into a landfill. The analysis was based on the default CalEEMod waste generation rates of 38.96 tons of solid waste per year from the proposed project.

The GHG analysis included implementation of Project Design Features 7 and 8. Project Design Feature 7 requires the project applicant to contract with a waste provider that provides recycling services that divert a minimum of 65 percent of solid waste generated from the proposed project. Project Design Feature 8 requires the building contractor to recycle a minimum of 65 percent of the nonhazardous construction debris generated from construction of the proposed project. Since some Statewide recycling measures are already in effect, mitigation of a 50 percent reduction in waste disposed was selected in the CalEEMod model.

Water and Wastewater

Water includes the water used for the interior of the building as well as for landscaping and is based on the GHG emissions associated with the energy used to transport and filter the water. The analysis was based on the default CalEEMod water usage rate of 1,010,050 gallons per year of indoor water usage and

195,740 gallons per year of outdoor water usage from the proposed project. No changes were made to the default water and wastewater parameters in the CalEEMod model.

The GHG analysis included implementation of Measure E-4.2, requires that new developments reduce indoor water consumption by 30 percent. Implementation of 2013 Title 24 Part 11 (CalGreen) standards, which are statewide regulations are anticipated to result in a 30 percent reduction in indoor water usage through requiring the use of low-flow faucets and toilets. In order to account for the CalGreen building standards, mitigation of Install low-flow faucets and toilets were selected in the CalEEMod model.

Vegetation

The GHG analysis included implementation of Measure E-1.1 from the Climate Action Plan, which requires that all new developments plant a minimum one 15 gallon nondeciduous umbrella form tree per 30 linear feet of boundary length. The exact implementation of Measure E-1.1 will be determined in the Landscape Plan, however since the Landscape Plan has not yet been completed, this analysis estimated the number of trees based on the project site boundary, which is approximately 1,400 linear feet and would result in the planting of 47 trees. Since the CalEEMod model provides the total metric tons anticipated to be sequestered over the trees lifetime, the CalEEMod results have been amortized over 30 years in order to obtain the anticipated annual GHG emissions reductions. In order to ensure compliance with this measure, Project Design Feature 5 has been incorporated into this analysis.

6.0 THRESHOLDS OF SIGNIFICANCE

6.1 Regional Air Quality

Many air quality impacts that derive from dispersed mobile sources, which are the dominate pollution generators in the Air Basin, often occurs hours later and miles away after photochemical processes have converted primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual project is generally very small and difficult to measure. Therefore, SCAQMD has developed significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. The SCAQMD CEQA Handbook states that any project in the Air Basin with daily emissions that exceed any of the identified significance thresholds should be considered as having an individually and cumulatively significant air quality impact. For the purposes to this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the SCAQMD significance thresholds identified in Table G.

Table G – SCAQMD Regional Criteria Pollutant Emission Thresholds of Significance

	Pollutant Emissions (pounds/day)						
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**	**Lead**
Construction	75	100	550	150	150	55	3
Operation	55	55	550	150	150	55	3

Source: http://www.aqmd.gov/ceqa/handbook/signthres.pdf

The regional criteria pollutants analysis for both construction and operation of the proposed project can be found below in Section 7.3.

6.2 Local Air Quality

Project-related construction air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin. In order to assess local air quality impacts the SCAQMD has developed Localized Significant Thresholds (LSTs) to assess the project-related air emissions in the project vicinity. SCAQMD has also provided *Final Localized Significance Threshold Methodology* (LST Methodology), July 2008, which details the methodology to analyze local air emission impacts. The LST Methodology found that the primary emissions of concern are NO_2, CO, PM10, and PM2.5.

The LST Methodology provides Look-Up Tables with different thresholds based on the location and size of the project site and distance to the nearest sensitive receptors. The project site is approximately 2.84-acres. In order to provide a conservative analysis, the 2-acre project shown in the Look Up Tables has been utilized in this analysis.

As detailed above in Section 4.3, the project site is located in Air Monitoring Area 25, which covers Lake Elsinore. For PM10 and PM2.5, which are based on a 24-hour standard, the nearest sensitive receptors are the single-family homes located as near as 1,700 feet (518 meters) to the west of the project site. In order to provide a conservative analysis, the 500 meter threshold shown in the Look Up Tables has been utilized for PM10 and PM2.5 in this analysis. For NOx, which is based on a 1-hour threshold and CO, which is based on an 8-hour threshold, the nearest sensitive receptors are the offsite workers located as near as 100 feet (30 meters) northwest of the project site. In order to provide a conservative analysis, the

25 meter threshold shown in the Look Up Tables has been utilized for NOx and CO in this analysis. Table H shows the LSTs for NOx, CO, PM10 and PM2.5 for both construction and operational activities.

Table H – SCAQMD Local Air Quality Thresholds of Significance

Activity	Allowable Emissions (pounds/day)[1]			
	NOx	CO	PM10	PM2.5
Construction	234	1,100	186	91
Operation	234	1,100	45	22

Notes:
[1] For NOx and CO the thresholds are based on the nearest offsite workers (100 feet or 30 meters), which utilized the 25 meter threshold. For PM10 and PM2.5 the thresholds are based on the nearest homes (1,700 feet or 518 meters), which utilized the 500 meter threshold.
Source: Calculated from SCAQMD's Mass Rate Look-up Tables for two acres in Air Monitoring Area 25, Lake Elsinore.

6.3 Toxic Air Contaminants

According to the SCAQMD CEQA Handbook, any project that has the potential to expose the public to toxic air contaminants in excess of the following thresholds would be considered to have a significant air quality impact:

- If the Maximum Incremental Cancer Risk is 10 in one million or greater; or
- Toxic air contaminants from the proposed project would result in a Hazard Index increase of 1 or greater.

In order to determine if the proposed project may have a significant impact related to toxic air contaminants (TACs), the *Health Risk Assessment Guidance for analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*, (Diesel Analysis) prepared by SCAQMD, August 2003, recommends that if the proposed project is anticipated to create TACs through stationary sources or regular operations of diesel trucks on the project site, then the proximity of the nearest receptors to the source of the TAC and the toxicity of the hazardous air pollutant (HAP) should be analyzed through a comprehensive facility-wide health risk assessment (HRA).

6.4 Odor Impacts

The SCAQMD CEQA Handbook states that an odor impact would occur if the proposed project creates an odor nuisance pursuant to SCAQMD Rule 402, which states:

> "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
>
> The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals."

If the proposed project results in a violation of Rule 402 with regards to odor impacts, then the proposed project would create a significant odor impact.

6.5 Greenhouse Gases

The City of Lake Elsinore has adopted the *City of Lake Elsinore Climate Action Plan* (CAP), on December 13, 2011, that includes a GHG emissions reduction target based on a community-wide

emissions reduction to 6.6 $MTCO_2e$ per service population per year by 2020 and 4.4 $MTCO_2e$ per year by 2030. These efficiency-based targets were derived by dividing the statewide AB 32 targeted emissions levels for 2020 and statewide Executive Order S-3-05 targeted emissions level for 2030. These targets represent the maximum quantity emissions each person in the State of California could emit in 2020 and 2030 based on emissions levels necessary to achieve the statewide AB 32 and Executive Order S-3-05 GHG emissions reduction goals.

It should be noted that the CAP was prepared prior to the issuance of Executive Order B-30-15 on April 29, 2015 that provided a reduction goal of 40 percent below 1990 levels by 2030. This target was codified into statute through passage of AB 197 and SB 32 in September 2016. The *Staff Report Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets,* prepared by CARB June 2017, provides recommendations the MPOs located within the State to meet the new SB 32 targets. For SCAG, which is the MPO that represents Southern California, including the project site, this Report recommends that SCAG increase its year 2035 efficiency target from an 18 percent reduction to a 21 percent reduction in order to account for AB 197 and SB 32. This equates to a 16.7 percent increase in SCAG reduction target for the year 2035. In order to provide a conservative analysis, they year 2030 efficiency target of 4.4 $MTCO_2e$ was reduced by 16.7 percent to account for AB 197 and SB 32, which results in a modified efficiency target of 3.7 $MTCO_2e$ for the year 2030.

Therefore, the proposed project would be considered to create a significant cumulative GHG emissions impact if the proposed project's GHG emissions exceeds the service population efficiency targets of 6.6 $MTCO_2e$ per year for year 2020 and 3.7 $MTCO_2e$ per year for year 2030.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality and global climate change would occur if the proposed project is determined to result in:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people.
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

7.2 Air Quality Compliance

The proposed project would not conflict with or obstruct implementation of the SCAQMD Air Quality Management Plan (AQMP). The following section discusses the proposed project's consistency with the SCAQMD AQMP.

SCAQMD Air Quality Management Plan

The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and regional plans (CEQA Guidelines Section 15125). The regional plan that applies to the proposed project includes the SCAQMD AQMP. Therefore, this section discusses any potential inconsistencies of the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards. If the decision-makers determine that the proposed project is inconsistent, the lead agency may consider project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

(2) Whether the project will exceed the assumptions in the AQMP or increments based on the year of project buildout and phase.

Both of these criteria are evaluated in the following sections.

Criterion 1 - Increase in the Frequency or Severity of Violations?

Based on the air quality modeling analysis contained in this report, short-term regional construction air emissions would not result in significant impacts based on SCAQMD regional thresholds of significance discussed above in Section 6.1 or local thresholds of significance discussed above in Section 6.2. The ongoing operation of the proposed project would generate air pollutant emissions that are inconsequential on a regional basis and would not result in significant impacts based on SCAQMD thresholds of significance discussed above in Section 6.1. The analysis for long-term local air quality impacts showed that local pollutant concentrations would not be projected to exceed the air quality standards. Therefore, a less than significant long-term impact would occur and no mitigation would be required.

Therefore, based on the information provided above, the proposed project would be consistent with the first criterion.

Criterion 2 - Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with the assumptions in the AQMP. The emphasis of this criterion is to insure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The AQMP is developed through use of the planning forecasts provided in the RTP/SCS and FTIP. The RTP/SCS is a major planning document for the regional transportation and land use network within Southern California. The RTP/SCS is a long-range plan that is required by federal and state requirements placed on SCAG and is updated every four years. The FTIP provides long-range planning for future transportation improvement projects that are constructed with state and/or federal funds within Southern California. Local governments are required to use these plans as the basis of their plans for the purpose of consistency with applicable regional plans under CEQA. For this project, the City of Lake Elsinore Business District, adopted December 13, 2011, defines the assumptions that are represented in AQMP.

The project site is designated as Limited Industrial in the Business District Plan and is zoned Commercial Manufacturing (CM). The proposed project is consistent with the current land use designation and would not require a General Plan Amendment or zone change. As such, the proposed project is not anticipated to exceed the AQMP assumptions for the project site and is found to be consistent with the AQMP for the second criterion.

Based on the above, the proposed project will not result in an inconsistency with the SCAQMD AQMP. Therefore, a less than significant impact will occur in relation to implementation of the AQMP.

Level of Significance

Less than significant impact.

7.3 Air Quality Standard Violation

The proposed project would not violate an air quality standard or contribute substantially to an existing or projected air quality violation. The following section calculates the potential air emissions associated with the construction and operations of the proposed project and compares the emissions to the SCAQMD standards.

Construction Emissions

The proposed project would consist of the development of an 18-vehicle fueling position gas station with two canopies that total 5,264 square feet, a 8,360 square foot convenience store (C-store), and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include a 65-space parking lot. The construction emissions have been analyzed for both regional and local air quality impacts.

Construction-Related Regional Impacts

The CalEEMod model has been utilized to calculate the construction-related regional emissions from the proposed project and the input parameters utilized in this analysis have been detailed in Section 5.1. The worst-case summer or winter daily construction-related criteria pollutant emissions from the proposed project for each phase of construction activities are shown below in Table I and the CalEEMod daily printouts are shown in Appendix A. Since it is possible that building construction, paving, and architectural coating activities may occur concurrently, Table I also shows the combined criteria pollutant emissions from building construction, paving and architectural coating phases of construction.

Table I – Construction-Related Regional Criteria Pollutant Emissions

	Pollutant Emissions (pounds/day)					
Activity	**VOC**	**NOx**	**CO**	**SO_2**	**PM10**	**PM2.5**
Site Preparation[1]						
Onsite	1.76	21.54	11.91	0.02	1.47	0.85
Offsite	0.06	0.71	0.48	0.00	0.13	0.04
Total	**1.82**	**22.25**	**12.39**	**0.02**	**1.60**	**0.89**
Grading[1]						
Onsite	2.03	22.74	10.15	0.02	3.63	2.30
Offsite	0.08	0.72	0.57	0.00	0.16	0.05
Total	**2.11**	**23.46**	**10.72**	**0.02**	**3.79**	**2.35**
Building Construction						
Onsite	2.56	18.91	15.25	0.03	1.09	1.04
Offsite	0.13	0.98	1.01	0.00	0.27	0.08
Total	**2.69**	**19.89**	**16.26**	**0.03**	**1.36**	**1.12**
Paving						
Onsite	1.68	11.59	11.81	0.02	0.66	0.61
Offsite	0.08	0.05	0.60	0.00	0.17	0.05
Total	**1.76**	**11.64**	**12.41**	**0.02**	**0.83**	**0.66**
Architectural Coatings						
Onsite	16.86	1.68	1.83	0.00	0.11	0.11
Offsite	0.02	0.01	0.16	0.00	0.05	0.01
Total	**16.88**	**1.69**	**1.99**	**0.00**	**0.16**	**0.12**
Combined Building Construction, Paving, and Architectural Coatings	**21.33**	**33.22**	**30.66**	**0.05**	**2.35**	**1.90**
SCQAMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	No	No	No	No	No	No

Notes:
[1] Site Preparation and Grading based on adherence to fugitive dust suppression requirements from SCAQMD Rule 403.
[2] Onsite emissions from equipment not operated on public roads.
[3] Offsite emissions from vehicles operating on public roads.
Source: CalEEMod Version 2016.3.2.

Table I shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds during site preparation, grading, or the combined building construction, paving, and architectural coatings phases. Therefore, a less than significant regional air quality impact would occur from construction of the proposed project.

Construction-Related Local Impacts

Construction-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin.

The local air quality emissions from construction were analyzed through utilizing the methodology described in *Localized Significance Threshold Methodology* (LST Methodology), prepared by SCAQMD, revised October 2009. The LST Methodology found the primary criteria pollutant emissions of concern are NOx, CO, PM10, and PM2.5. In order to determine if any of these pollutants require a detailed analysis of the local air quality impacts, each phase of construction was screened using the SCAQMD's Mass Rate LST Look-up Tables. The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily onsite emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. Table J shows the onsite emissions from the CalEEMod model for the different construction phases and the calculated emissions thresholds that have been detailed above in Section 6.2. Since it is possible that building construction, paving, and architectural coating activities may occur concurrently, Table J also shows the combined local criteria pollutant emissions from building construction, paving and architectural coating phases of construction.

Table J – Construction-Related Local Criteria Pollutant Emissions

Phase	Pollutant Emissions (pounds/day)			
	NOx	**CO**	**PM10**	**PM2.5**
Site Preparation[1]	21.54	11.91	1.47	0.85
Grading[1]	22.74	10.15	3.63	2.30
Combined Building Construction, Paving, and Architectural Coatings	32.18	28.89	1.86	1.76
- *Building Construction*	*18.91*	*15.25*	*1.09*	*1.04*
- *Paving*	*11.59*	*11.81*	*0.66*	*0.61*
- *Architectural Coatings*	*1.68*	*1.83*	*0.11*	*0.11*
SCAQMD Localized Thresholds[2]	**234**	**1,100**	**186**	**91**
Exceeds Threshold?	No	No	No	No

Notes:
[1] Site Preparation and Grading based on adherence to fugitive dust suppression requirements from SCAQMD Rule 403.
[2] For NOx and CO the thresholds are based on the nearest offsite workers (100 feet or 30 meters), which utilized the 25 meter threshold. For PM10 and PM2.5 the thresholds are based on the nearest homes (1,700 feet or 518 meters), which utilized the 500 meter threshold.
Source: Calculated from CalEEMod and SCAQMD's Mass Rate Look-up Tables for two acres in Air Monitoring Area 25, Lake Elsinore.

The data provided in Table J shows that none of the analyzed criteria pollutants would exceed the local emissions thresholds during the site preparation or grading phase or the combined building construction, paving, and architectural coatings phases. Therefore, a less than significant local air quality impact would occur from construction of the proposed project.

Operational Emissions

The on-going operation of the proposed project would result in a long-term increase in air quality emissions. This increase would be due to emissions from the project-generated vehicle trips and through operational emissions from the on-going use of the proposed project. The following section provides an

analysis of potential long-term air quality impacts due to regional air quality and local air quality impacts from the on-going operations of the proposed project.

Operations-Related Regional Air Quality Impacts

The operations-related regional air quality impacts created by the proposed project have been analyzed through use of the CalEEMod model and the input parameters utilized in this analysis have been detailed in Section 5.2. The worst-case summer or winter VOC, NOx, CO, SO_2, PM10, and PM2.5 daily emissions created from the proposed project's long-term operations have been calculated and are summarized below in Table K and the CalEEMod daily emissions printouts are shown in Appendix A.

Table K – Operational Regional Criteria Pollutant Emissions

	Pollutant Emissions (pounds/day)					
Activity	**VOC**	**NOx**	**CO**	**SO_2**	**PM10**	**PM2.5**
Area Sources[1]	0.39	0.00	0.01	0.00	0.00	0.00
Energy Usage[2]	0.03	0.31	0.26	0.00	0.02	0.02
Mobile Sources[3]	7.93	48.57	45.88	0.16	8.44	2.35
Total Emissions	**8.35**	**48.88**	**46.15**	**0.16**	**8.46**	**2.37**
SCQAMD Operational Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold?	No	No	No	No	No	No

Notes:
[1] Area sources consist of emissions from consumer products, architectural coatings, and landscaping equipment.
[2] Energy usage consist of emissions from natural gas usage (excluding hearths).
[3] Mobile sources consist of emissions from vehicles and road dust.
Source: Calculated from CalEEMod Version 2016.3.2.

The data provided in Table K above shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds. Therefore, a less than significant regional air quality impact would occur from operation of the proposed project.

Operations-Related Local Air Quality Impacts

Project-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin. The proposed project has been analyzed for the potential local CO emission impacts from the project-generated vehicular trips and from the potential local air quality impacts from on-site operations. The following analysis analyzes the vehicular CO emissions and local impacts from on-site operations.

Local CO Hotspot Impacts from Project-Generated Vehicular Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential local air quality impacts. Local air quality impacts can be assessed by comparing future without and with project CO levels to the State and Federal CO standards of 20 ppm over one hour or 9 ppm over eight hours.

At the time of the 1993 Handbook, the Air Basin was designated nonattainment under the CAAQS and NAAQS for CO. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the Air Basin and in the state have steadily declined. In 2007, the Air Basin was designated in attainment for CO under both the CAAQS and NAAQS. SCAQMD conducted a CO hot spot analysis for attainment at the busiest intersections in Los

Angeles during the peak morning and afternoon periods and did not predict a violation of CO standards[1]. Since the nearby intersections to the proposed project are much smaller with less traffic than what was analyzed by the SCAQMD, no local CO Hotspot are anticipated to be created from the proposed project and no CO Hotspot modeling was performed. Therefore, a less than significant long-term air quality impact is anticipated to local air quality with the on-going use of the proposed project.

Local Criteria Pollutant Impacts from Onsite Operations

Project-related air emissions from onsite sources such as architectural coatings, landscaping equipment, and onsite usage of natural gas appliances may have the potential to create emissions areas that exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin.

The local air quality emissions from on-site operations were analyzed using the SCAQMD's Mass Rate LST Look-up Tables and the methodology described in LST Methodology. The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. Table L shows the onsite emissions from the CalEEMod model that includes area sources, energy usage, vehicles, and off-road equipment operating onsite and the calculated emissions thresholds.

Table L – Operations-Related Local Criteria Pollutant Emissions

	Pollutant Emissions (pounds/day)			
On-Site Emission Source	**NOx**	**CO**	**PM10**	**PM2.5**
Area Sources	0.00	0.00	0.00	0.00
Energy Usage	0.31	0.26	0.02	0.02
Onsite Vehicle Emissions[1]	6.07	5.74	1.06	0.29
Total Emissions	**6.38**	**6.01**	**1.08**	**0.31**
SCAQMD Localized Thresholds[2]	**234**	**1,100**	**45**	**22**
Exceeds Threshold?	No	No	No	No

Notes:
[1] Onsite vehicle emissions based on 1/8 of the gross vehicular emissions, which is the estimated portion of vehicle emissions occurring within a quarter mile of the project site.
[2] For NOx and CO the thresholds are based on the nearest offsite workers (100 feet or 30 meters), which utilized the 25 meter threshold. For PM10 and PM2.5 the thresholds are based on the nearest homes (1,700 feet or 518 meters), which utilized the 500 meter threshold.
Source: Calculated from CalEEMod and SCAQMD's Mass Rate Look-up Tables for two acres in Air Monitoring Area 25, Lake Elsinore.

The data provided in Table L shows that the on-going operations of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 6.2. Therefore, the on-going operations of the proposed project would create a less than significant operations-related impact to local air quality due to on-site emissions and no mitigation would be required.

Level of Significance

Less than significant impact.

[1] The four intersections analyzed by the SCAQMD were: Long Beach Boulevard and Imperial Highway; Wilshire Boulevard and Veteran Avenue; Sunset Boulevard and Highland Avenue; and La Cienega Boulevard and Century Boulevard. The busiest intersection evaluated (Wilshire and Veteran) had a daily traffic volume of approximately 100,000 vehicles per day with LOS E in the morning and LOS F in the evening peak hour.

7.4 Cumulative Net Increase in Non-Attainment Pollution

The proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources, which travel throughout the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered would cover an even larger area. Accordingly, the cumulative analysis for the project's air quality must be generic by nature. The project area is out of attainment for ozone and PM10 and PM2.5 particulate matter. In accordance with CEQA Guidelines Section 15130(b), this analysis of cumulative impacts incorporates a three-tiered approach to assess cumulative air quality impacts.

- Consistency with the SCAQMD project specific thresholds for construction and operations;
- Project consistency with existing air quality plans; and
- Assessment of the cumulative health effects of the pollutants.

Consistency with Project Specific Thresholds

Construction-Related Impacts

The project site is located in the South Coast Air Basin, which is currently designated by the EPA for federal standards as a non-attainment area for ozone and PM2.5 and by CARB for the state standards as a non-attainment area for ozone, PM10, and PM2.5. The regional ozone, PM10, and PM2.5 emissions associated with construction of the proposed project have been calculated above in Section 7.3. The above analysis found that development of the proposed project would result in less than significant regional emissions of VOC and NOx (ozone precursors), PM10, and PM2.5 during construction of the proposed project. Therefore, a less than significant cumulative impact would occur from construction of the proposed project.

Operational-Related Impacts

The greatest cumulative operational impact on the air quality to the Air Basin will be the incremental addition of pollutants mainly from increased traffic from residential, commercial, and industrial development. In accordance with SCAQMD methodology, projects that do not exceed SCAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact. The regional ozone, PM10, and PM2.5 emissions created from the on-going operations of the proposed project have been calculated above in Section 7.3. The above analysis found that development of the proposed project would result in less than significant regional emissions of VOC and NOx (ozone precursors), PM10, and PM2.5 during operation of the proposed project. With respect to long-term emissions, this project would create a less than significant cumulative impact.

Consistency with Air Quality Plans

As detailed above in Section 7.2, the project site is currently designated as Limited Industrial in the Business District Plan and is zoned Commercial Manufacturing (CM). The proposed project is consistent with the current land use designation and would not require a General Plan Amendment or zone change. Therefore, the proposed project would not result in an inconsistency with the current land use designation. As such, the proposed project is not anticipated to exceed the AQMP assumptions for the project site and is found to be consistent with the AQMPs for the Air Basin.

Cumulative Health Impacts

The Air Basin is designated as nonattainment for ozone, PM10, and PM2.5, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect public health, including the health of sensitive individuals (elderly, children, and the sick). Therefore, when the concentrations of those pollutants exceeds the standard, it is likely that some sensitive individuals in the population would experience health effects. The regional analysis detailed above in Section 7.3 found that the proposed project would not exceed the SCAQMD regional significance thresholds for VOC and NOx (ozone precursors), PM10 and PM2.5. As such, the proposed project would result in a less than significant cumulative health impact.

Level of Significance

Less than significant impact.

7.5 Sensitive Receptors

The proposed project would not expose sensitive receptors to substantial pollutant concentrations. The local concentrations of criteria pollutant emissions produced in the nearby vicinity of the proposed project, which may expose sensitive receptors to substantial concentrations have been calculated above in Section 7.3 for both construction and operations, which are discussed separately below. The discussion below also includes an analysis of the potential impacts from toxic air contaminant emissions. The nearest sensitive receptors are the offsite workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet southwest of the project site

Construction-Related Sensitive Receptor Impacts

Construction of the proposed project may expose sensitive receptors to substantial pollutant concentrations of localized criteria pollutant concentrations and from toxic air contaminant emissions created from onsite construction equipment, which are described below.

Local Criteria Pollutant Impacts from Construction

The local air quality impacts from construction of the proposed project has been analyzed above in Section 7.3 and found that the construction of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 6.2. Therefore, construction of the proposed project would create a less than significant construction-related impact to local air quality and no mitigation would be required.

Toxic Air Contaminants Impacts from Construction

The greatest potential for toxic air contaminant emissions would be related to diesel particulate matter (DPM) emissions associated with heavy equipment operations during construction of the proposed project. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. Given the relatively limited number of heavy-duty construction equipment and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 70 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. In addition, California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449 regulates emissions from off-road diesel equipment in California. This regulation limits idling of equipment to no more than five minutes, requires equipment operators to label each piece of equipment and provide annual reports to CARB of their fleet's usage and emissions. This regulation also

requires systematic upgrading of the emission Tier level of each fleet, and currently no commercial operator is allowed to purchase Tier 0 or Tier 1 equipment and by January 2023 no commercial operator is allowed to purchase Tier 2 equipment. In addition to the purchase restrictions, equipment operators need to meet fleet average emissions targets that become more stringent each year between years 2014 and 2023. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project. As such, construction of the proposed project would result in a less than significant exposure of sensitive receptors to substantial pollutant concentrations.

Operations-Related Sensitive Receptor Impacts

The on-going operations of the proposed project may expose sensitive receptors to substantial pollutant concentrations of local CO emission impacts from the project-generated vehicular trips and from the potential local air quality impacts from onsite operations. The following analyzes the vehicular CO emissions. Local criteria pollutant impacts from onsite operations, and toxic air contaminant impacts.

Local CO Hotspot Impacts from Project-Generated Vehicle Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential impacts to sensitive receptors. The analysis provided above in Section 7.3 shows that no local CO Hotspots are anticipated to be created at any nearby intersections from the vehicle traffic generated by the proposed project. Therefore, operation of the proposed project would result in a less than significant exposure of offsite sensitive receptors to substantial pollutant concentrations.

Local Criteria Pollutant Impacts from Onsite Operations

The local air quality impacts from the operation of the proposed project would occur from onsite sources such as architectural coatings, landscaping equipment, and onsite usage of natural gas appliances. The analysis provided above in Section 7.3 found that the operation of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 6.2. Therefore, the on-going operations of the proposed project would create a less than significant operations-related impact to local air quality due to on-site emissions and no mitigation would be required.

Operations-Related Toxic Air Contaminant Impacts

The proposed project would include an 18-fueling position gas and diesel station that has been estimated to have a throughput of 2 million gallons of gasoline per year. The *Emission Inventory and Risk Assessment Guidelines for Gasoline Dispensing Stations* (Gas Station Risk Assessment), prepared by SCAQMD, January 2007, analyzed the TAC emissions and associated cancer risks from gasoline dispensing facilities at locations throughout the Air Basin. It should be noted that the proposed project would also sell diesel fuel, however the Gas Station Risk Assessment did not find diesel fueling activities as a source of substantial TAC emissions and therefore this analysis has been limited to the analysis of TAC emissions created from gasoline dispensing stations.

The Gas Station Risk Assessment provides residential cancer risk Look Up Tables that are based on the wind patterns from representative monitoring stations throughout Southern California. The Norco Monitoring Station data from the Look Up Tables was utilized as that is the nearest location to the project site. Based on a worst-case analysis of the nearest homes being located as near as 500 meters (1,640 feet) downwind from the gas fuel dispensers, the Look Up Tables show that a one million gallon per year gas throughput gas station would create a residential cancer risk of 0.02 per million persons. Based on the formula provided in the Gas Station Risk Assessment, the proposed project with a throughput of 2 million gallons per year would create a **cancer risk of 0.04 per million persons**. The project-related cancer risk

of 0.04 per million persons would be within the SCAQMD's threshold of 10 per million detailed above in Section 6.3. As such, the TAC emissions and associated cancer risks from the proposed gas station would result in a less than significant impact to the nearby residents.

Therefore, operation of the proposed project would result in a less than significant exposure of sensitive receptors to substantial pollutant concentrations.

Level of Significance

Less than significant impact.

7.6 Objectionable Odors

The proposed project would not create objectionable odors affecting a substantial number of people. Potential odor impacts have been analyzed separately for construction and operations below.

Individual responses to odors are highly variable and can result in a variety of effects. Generally, the impact of an odor results from a variety of factors such as frequency, duration, offensiveness, location, and sensory perception. The frequency is a measure of how often an individual is exposed to an odor in the ambient environment. The intensity refers to an individual's or group's perception of the odor strength or concentration. The duration of an odor refers to the elapsed time over which an odor is experienced. The offensiveness of the odor is the subjective rating of the pleasantness or unpleasantness of an odor. The location accounts for the type of area in which a potentially affected person lives, works, or visits; the type of activity in which he or she is engaged; and the sensitivity of the impacted receptor.

Sensory perception has four major components: detectability, intensity, character, and hedonic tone. The detection (or threshold) of an odor is based on a panel of responses to the odor. There are two types of thresholds: the odor detection threshold and the recognition threshold. The detection threshold is the lowest concentration of an odor that will elicit a response in a percentage of the people that live and work in the immediate vicinity of the project site and is typically presented as the mean (or 50 percent of the population). The recognition threshold is the minimum concentration that is recognized as having a characteristic odor quality, this is typically represented by recognition by 50 percent of the population. The intensity refers to the perceived strength of the odor. The odor character is what the substance smells like. The hedonic tone is a judgment of the pleasantness or unpleasantness of the odor. The hedonic tone varies in subjective experience, frequency, odor character, odor intensity, and duration.

Construction-Related Odor Impacts

Potential sources that may emit odors during construction activities include the application of coatings such as asphalt pavement, paints and solvents and from emissions from diesel equipment. The objectionable odors that may be produced during the construction process would be temporary and would not likely be noticeable for extended periods of time beyond the project site's boundaries. Due to the transitory nature of construction odors, a less than significant odor impact would occur and no mitigation would be required.

Potential Operations-Related Odor Impacts

The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast-food restaurant with a drive-thru window, and a parking lot. Potential sources that may emit odors during the on-going operations of the proposed project would primarily occur from odor emissions from gas dispensing activities and from the trash storage areas. Pursuant to SCAQMD Rule 461 the proposed gas station will be required to utilize gas dispensing equipment that minimizes vapor and liquid leaks and requires that the equipment be maintained at proper working order, which will

minimize odor impacts occurring from the gasoline and diesel dispensing facilities. Pursuant to City regulations, permanent trash enclosures that protect trash bins from rain as well as limit air circulation would be required for the trash storage areas. Due to the distance of the nearest receptors from the project site and through compliance with SCAQMD's Rule 461 and City trash storage regulations, no significant impact related to odors would occur during the on-going operations of the proposed project. Therefore, a less than significant odor impact would occur and no mitigation would be required.

Level of Significance

Less than significant impact.

7.7 Generation of Greenhouse Gas Emissions

The proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast-food restaurant with a drive-thru window, and a parking lot. The City of Lake Elsinore has adopted the *City of Lake Elsinore Climate Action Plan* (Climate Action Plan), on December 13, 2011, which provides service population efficiency targets of 6.6 $MTCO_2e$ per year for year 2020 and 4.4 $MTCO_2e$ per year for 2030.

In order to determine if the proposed project meets the efficiency targets set forth in the Climate Action Plan, the GHG emissions from the proposed project were analyzed for year 2020 conditions. A summary of the results is shown below in Table M and the CalEEMod model run for year 2020 is provided in Appendix B.

Table M – Proposed Project Greenhouse Gas Annual Emissions

	Greenhouse Gas Emissions (Metric Tons per Year)			
Category	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Area Sources[1]	0.00	0.00	0.00	0.00
Energy Usage[2]	132.50	0.00	0.00	133.11
Mobile Sources[3]	2,057.31	0.23	0.00	2,062.96
Solid Waste[4]	3.95	0.23	0.00	9.80
Water and Wastewater[5]	4.46	0.03	0.00	5.36
Construction[6]	8.93	0.00	0.00	8.97
Vegetation[7]				-1.11
Total GHG Emissions	**2,207.15**	**0.49**	**0.00**	**2,219.09**
SCAQMD Draft Threshold of Significance for All Land Uses				**3,000**
Service Population[8]				**2,095**
Year 2020 Emissions per Service Population				**1.1**
City of Lake Elsinore CAP Year 2020 Efficiency Target				**6.6**
City of Lake Elsinore CAP Modified Year 2030 Efficiency Target[9]				**3.7**

Notes:
[1] Area sources consist of GHG emissions from consumer products, architectural coatings, and landscaping equipment.
[2] Energy usage consists of GHG emissions from electricity and natural gas usage.
[3] Mobile sources consist of GHG emissions from vehicles.
[4] Waste includes the CO_2 and CH_4 emissions created from the solid waste placed in landfills.
[5] Water includes GHG emissions from electricity used for transport of water and processing of wastewater.
[6] Construction emissions amortized over 30 years as recommended in the SCAQMD GHG Working Group on November 19, 2009.
[7] Vegetation sequestration amortized over 30 years.
[8] Service population based on the total daily trips to the project site (Dudek, 2018) and then divided by two, since each customer and employee would make one trip to the project site and one trip leaving the project site.
[9] The CAP's Year 2030 Efficiency Target of 4.4 $MTCO_2e$ per year was reduced by 16.7 percent to account for AB 197 and SB 32.
Source: CalEEMod Version 2016.3.2.

Table M above shows that for the year 2020, the proposed project would create 1,219.09 $MTCO_2e$ per year, which is within the SCAQMD's draft threshold of significance for all land use types of 3,000 $MTCO_2e$ per year. Table M also shows that the project GHG emissions would result in an efficiency rate of 1.1 $MTCO_2e$ per year per service population. The GHG emissions from the proposed project would be within the CAP's Year 2020 Efficiency Target of 6.6 $MTCO_2e$ per year and within the modified CAP's 2030 Efficiency Target of 3.74 $MTCO_2e$ per year that has been modified to account for the more stringent GHG emissions reductions required by AB 197 and SB 32. It should be noted that the Year 2020 emissions are based on approved statewide GHG reduction measures and the required GHG reduction measures provided in the City's Climate Action Plan which are detailed below in Section 7.8 and include Project Design Features 1 through 8. Therefore, impacts would be less than significant.

Level of Significance

Less than significant impact.

7.8 Greenhouse Gas Plan Consistency

The proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions. The City of Lake Elsinore has adopted the *City of Lake Elsinore Climate Action Plan* (Climate Action Plan), on December 13, 2011. The Climate Action Plan provides specific measures to be implemented in new developments to reduce GHG emissions as well as a GHG emissions reduction target based on a community-wide emissions reduction to 6.6 $MTCO_2e$ per service population per year by 2020. Table N provides a list of the applicable reduction measures for new non-residential developments included in the Climate Action Plan. Table N also provides a project consistency analysis of each measure.

Table N – GHG Reduction Measures for New Developments and Project Consistency

Local Measure	Measure Description	Project Consistency
T-1.2: Pedestrian Infrastructure	Through the development review process, require the installation of sidewalks along new and reconstructed streets. Also require new subdivisions and large developments to provide sidewalks or paths to internally link all uses where applicable and provide connections to neighborhood activity centers, major destinations, and transit facilities contiguous with the project site; implement through conditions of approval.	**Consistent.** Project Design Feature 1 is provided that requires the installation of sidewalks along the project site boundary that is adjacent to Riverside drive and Collier Avenue as well as internal sidewalks to connect to neighborhood activity centers, major destinations, and transit facilities.
T-1.4: Bicycle Infrastructure	Through the development review process, require new development, as applicable, to implement and connect to the network of Class I, II and III bikeways, trails and safety features identified in the General Plan, Bike Lane Master Plan, Trials Master Plan and Western Riverside County Non-Motorized Transportation plan, implement through conditions of approval. The City will also continue to pursue and utilize funding when needed to implement portions of these plans.	**Consistent.** Project Design Feature 2 is provided which requires the installation of a bike lane along the project site boundary with Riverside Drive and Collier Avenue. See the Lake Elsinore General Plan Circulation Element, Figure 2.5 Bikeway Plan.
T-1.5: Bicycle Parking Standards	Through the development review process, enforce the following short-term and long-term bicycle parking standards for new non-residential development (consistent with 2010 California Green Building Code [CalGreen], Section 5.106.4), and implement through conditions of approval:	**Consistent.** Project Design Feature 3 is provided which requires the installation of bicycle parking spaces to equal five percent of the visitor parking capacity. The Site Plan for the project details the locations of the two bike racks, with one located east of the

Table N – GHG Reduction Measures for New Developments and Project Consistency

Local Measure	Measure Description	Project Consistency
	• *Short-Term Bicycle Parking:* If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitor entrance, readily visible to passers-by, for 5% of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack. • *Long-Term Bicycle Parking*: For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5% of tenant-occupied motorized vehicle parking capacity, with a minimum of one space.	Convenience Store entrance and the other located south of the Drive-Thru restaurant entrance.
T-3.1: Mixed Use, High Density, Infill and Transit Oriented Development	Revise the Land Use Map and Municipal Code to allow for and/or increase the amount of mixed use, high density, infill and transit oriented development. Mixed-use projects should be targeted in the Historic and Ballpark Districts, as well as other areas where services are within walking distance. High density projects should be located in urbanized areas adjacent to services and transportation. Update the Municipal Code for consistency between zoning regulations and General Plan land use designations.	**Consistent.** The proposed project will be developed on a street with commercial uses located within walking distance and the nearest bus stop is located as near as 80 feet northeast of the project site.
T-4.1: Commute Trip Reduction Program	Institute a commute trip reduction program for employers with fewer than 100 employees (below the requirements of the existing Transportation Demand Management Program). Provide information, training, and incentives to encourage participation.	**Consistent.** Project Design Feature 4 is provided that requires the applicant to install a board in the employee work area of the Convenience Store and Drive-Thru Restaurant that provides bus route maps and information about carpooling and bicycling to work.
E-1.1: Tree Planting Requirements	Require new development to plant at minimum one 15-gallon nondeciduous, umbrella-form tree per 30 linear feet of boundary length near buildings, per the Municipal Code. Trees shall be planted in strategic locations around buildings or to shade pavement in parking lots and streets.	**Consistent.** Project Design Feature 5 is provided that requires the applicant to prepare a landscape plan that meets the requirement to plant a minimum of one 15 gallon nondeciduous umbrella form tree per 30 linear feet of boundary length (minimum of 47 trees for the project site).
E-1.2 Cool Roof Requirements	Amend the City Municipal Code to require new non-residential development to use roofing materials having solar reflectance, thermal emittance or Solar Reflectance Index (SRI)3 consistent with CalGreen Tier 1 values (Table A5.106.11.2.1), and implement through conditions of approval.	**Consistent.** Project Design Feature 6 is provided that requires the applicant to use roofing material that has a Solar Reflective Index (SRI) of 75 or higher as detailed in Section 140.3 of the 2013 Title 24 Part 6 (CalGren) Building Standards.
E-1.3: Energy Efficient Building Standards	Adopt an ordinance requiring that all new construction exceed the California Energy Code requirements, based on the 2008 Energy Efficiency Standards by 15% (consistent with CalGreen Tier 1), through either the performance based on prescriptive approach described in the California Green Building Code; implement through	**Consistent.** The proposed project will be required to be designed to meet Title 24 Part 6 year 2016 Building Energy Efficiency standards that provide over 40% greater efficiency than the 2008 Energy Efficiency Standards.

Table N – GHG Reduction Measures for New Developments and Project Consistency

Local Measure	Measure Description	Project Consistency
	conditions of approval. Alternatively, a solar photovoltaic system and/or solar water heating may be used to assist in meeting all or a portion of the 15% requirement.	
E-4.1: Landscaping Ordinance	Enforce the City's Assembly Bill 1881 Landscaping Ordinance; implement through conditions of approval.	**Consistent.** Project Design Feature 5 is provided that requires the Landscape Plan to be designed to be consistent with the requirements of AB 1881.
E-4.2: Indoor Water Conservation Requirements	Amend the City's Uniform Building Code to require development projects to reduce indoor water consumption by 30% (consistent with CalGreen Tier 1, Section A5.303.2.3.1), and implement through conditions of approval.	**Consistent.** The proposed project will utilize water fixtures that are sold in California that are required to meet CCR Title 20, Sections 1601 – 1608 that require all water fixtures to be low flow and provide an average water use reduction of 30%.
S-1.1: Commercial Recycling	Renegotiate the contract with the waste provider to require curbside recycling for all commercial land uses to divert 65% of commercial solid waste by 2020 and 75% of commercial solid waste by 2030.	**Consistent.** Project Design Feature 7 is provided that requires the applicant to contract with a waste provider that provides recycling services and diverts a minimum of 65 percent of solid waste generated by the project.
S-1.4: Construction and Demolition Waste Diversion	Amend the Municipal Code to require development projects to divert, recycle or salvage at least 65% of nonhazardous construction and demolition debris generated at the site by 2020 (consistent with CalGreen Tier 1, Section A 5.408.3.1). Require all construction and demolition projects to be accompanied by a waste management plan for the project and a copy of the completed waste management report shall be provided upon completion.	**Consistent.** Project Design Feature 8 is provided that requires the building contractor for the proposed project to recycle a minimum of 65 percent of the nonhazardous construction debris and to prepare a waste management plan that details how this is achieved.

Source: City of Lake Elsinore Climate Action Plans, December 13, 2011.

As shown above in Table N, with implementation of Project Design Features 1 through 8, the proposed project is consistent with the applicable local measures provided in the Climate Action Plan. In addition, Section 7.7 found that the proposed project would comply with the City's year 2020 efficiency target of 6.6 $MTCO_2e$ per year and modified year 2030 efficiency target of 3.7 $MTCO_2e$ per year that has been modified to account for the more stringent GHG emissions reductions required by AB 197 and SB 32. Therefore, the proposed project would comply with the Climate Action Plan's local measures and reduction targets and would not conflict with the applicable plan for reducing GHG emissions. Impacts would be less than significant.

Level of Significance

Less than significant impact.

8.0 REFERENCES

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APPENDIX A

CalEEMod Model Daily Printouts

Kassab Travel Center

Riverside-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	78.00	Space	2.00	31,200.00	0
Fast Food Restaurant with Drive Thru	2.54	1000sqft	0.24	2,543.00	0
Gasoline/Service Station	18.00	Pump	0.60	14,452.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Opening Year 2020

Land Use - 18-Pump, 14,452 SF Gas Sttion on 0.6 AC; 2.543 SF Fast Food Restaurant with Drive-Thru on 0.24 AC; and 78-space Parking Lot on 2 AC.

Construction Phase - 5 days Site Prep; 10 days Grading; 220 days Building Construction; 10 days Paving; and 10 days Painting.

Trips and VMT - To account for water trucks, 6 vendor trips added to Site Prep and Grading phases.

Grading -

Vehicle Trips - Gas Service Station Trip Rate of 162.78 obtained from the Traffic Impact Analysis revised by Dudek, August 2018.

Energy Use -

Sequestration - Required to plant 47 new miscellaneous trees.

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected.

Mobile Land Use Mitigation - Increase transit to nearest busstop (0.02 miles from the project site) and provide sidewalks onsite and connecting offsite.

Energy Mitigation - Exceed Title 24 by 30% and improve lighting efficiency by 25%.

Water Mitigation - Install low-flow fixtures and water-efficient irrigation systems.

Waste Mitigation - 50% reduction in waste.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	2,540.00	2,543.00
tblLandUse	LandUseSquareFeet	2,541.15	14,452.00
tblLandUse	LotAcreage	0.70	2.00
tblLandUse	LotAcreage	0.06	0.24
tblLandUse	LotAcreage	0.06	0.60
tblSequestration	NumberOfNewTrees	0.00	47.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblVehicleTrips	WD_TR	168.56	162.78

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6893	23.4612	16.2692	0.0293	6.7025	1.0984	7.7814	3.4082	1.0528	4.4009	0.0000	2,750.1168	2,750.1168	0.7836	0.0000	2,762.7369
2020	16.8850	18.3139	15.8139	0.0292	0.2636	0.9542	1.2178	0.0711	0.9145	0.9856	0.0000	2,718.5034	2,718.5034	0.5459	0.0000	2,730.6643
Maximum	**16.8850**	**23.4612**	**16.2692**	**0.0293**	**6.7025**	**1.0984**	**7.7814**	**3.4082**	**1.0528**	**4.4009**	**0.0000**	**2,750.1168**	**2,750.1168**	**0.7836**	**0.0000**	**2,762.7369**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6893	23.4612	16.2692	0.0293	2.7056	1.0984	3.7845	1.3540	1.0528	2.3468	0.0000	2,750.1168	2,750.1168	0.7836	0.0000	2,762.7369
2020	16.8850	18.3139	15.8139	0.0292	0.2636	0.9542	1.2178	0.0711	0.9145	0.9856	0.0000	2,718.5034	2,718.5034	0.5459	0.0000	2,730.6643
Maximum	**16.8850**	**23.4612**	**16.2692**	**0.0293**	**2.7056**	**1.0984**	**3.7845**	**1.3540**	**1.0528**	**2.3468**	**0.0000**	**2,750.1168**	**2,750.1168**	**0.7836**	**0.0000**	**2,762.7369**

Kassab Travel Center - Riverside-South Coast County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	57.38	0.00	44.41	59.04	0.00	38.14	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037
Mobile	7.9267	48.5745	45.8825	0.1598	8.3021	0.1316	8.4337	2.2216	0.1238	2.3454		16,390.2894	16,390.2894	1.5273		16,428.4705
Total	**8.3551**	**48.8874**	**46.1555**	**0.1617**	**8.3021**	**0.1554**	**8.4575**	**2.2216**	**0.1476**	**2.3692**		**16,765.7834**	**16,765.7834**	**1.5345**	**6.8800e-003**	**16,806.1973**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
Mobile	7.8278	47.5717	42.8931	0.1475	7.3225	0.1202	7.4427	1.9594	0.1131	2.0725		15,142.2336	15,142.2336	1.4914		15,179.5177
Total	**8.2525**	**47.8509**	**43.1377**	**0.1492**	**7.3225**	**0.1415**	**7.4640**	**1.9594**	**0.1343**	**2.0938**		**15,477.1638**	**15,477.1638**	**1.4979**	**6.1400e-003**	**15,516.4396**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	1.23	2.12	6.54	7.73	11.80	8.95	11.75	11.80	9.00	11.63	0.00	7.69	7.69	2.39	10.76	7.67

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2019	3/7/2019	5	5	
2	Grading	Grading	3/8/2019	3/21/2019	5	10	
3	Building Construction	Building Construction	3/22/2019	1/23/2020	5	220	
4	Paving	Paving	1/24/2020	2/6/2020	5	10	
5	Architectural Coating	Architectural Coating	2/7/2020	2/20/2020	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5

Acres of Paving: 2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 25,493; Non-Residential Outdoor: 8,498; Striped Parking Area: 1,872 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	19.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854		2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**1.5908**	**0.8537**	**2.4445**	**0.1718**	**0.7854**	**0.9572**		**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0441	0.0270	0.3554	9.1000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		91.0018	91.0018	2.5500e-003		91.0655
Total	**0.0640**	**0.7100**	**0.4834**	**2.4900e-003**	**0.1278**	**5.7400e-003**	**0.1336**	**0.0348**	**5.4700e-003**	**0.0403**		**257.3834**	**257.3834**	**0.0159**		**257.7799**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6204	0.0000	0.6204	0.0670	0.0000	0.0670			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854	0.0000	2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**0.6204**	**0.8537**	**1.4741**	**0.0670**	**0.7854**	**0.8524**	**0.0000**	**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0441	0.0270	0.3554	9.1000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		91.0018	91.0018	2.5500e-003		91.0655
Total	**0.0640**	**0.7100**	**0.4834**	**2.4900e-003**	**0.1278**	**5.7400e-003**	**0.1336**	**0.0348**	**5.4700e-003**	**0.0403**		**257.3834**	**257.3834**	**0.0159**		**257.7799**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871		2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**6.5523**	**1.0730**	**7.6253**	**3.3675**	**0.9871**	**4.3546**		**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0551	0.0338	0.4443	1.1400e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		113.7522	113.7522	3.1800e-003		113.8319
Total	**0.0750**	**0.7168**	**0.5723**	**2.7200e-003**	**0.1502**	**5.8800e-003**	**0.1561**	**0.0407**	**5.6000e-003**	**0.0463**		**280.1338**	**280.1338**	**0.0165**		**280.5462**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5554	0.0000	2.5554	1.3133	0.0000	1.3133			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871	0.0000	2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**2.5554**	**1.0730**	**3.6284**	**1.3133**	**0.9871**	**2.3005**	**0.0000**	**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0551	0.0338	0.4443	1.1400e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		113.7522	113.7522	3.1800e-003		113.8319
Total	**0.0750**	**0.7168**	**0.5723**	**2.7200e-003**	**0.1502**	**5.8800e-003**	**0.1561**	**0.0407**	**5.6000e-003**	**0.0463**		**280.1338**	**280.1338**	**0.0165**		**280.5462**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449		2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**		**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0267	0.9107	0.1707	2.1100e-003	0.0512	6.9200e-003	0.0582	0.0148	6.6200e-003	0.0214		221.8421	221.8421	0.0178		222.2859
Worker	0.1046	0.0642	0.8441	2.1700e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		216.1292	216.1292	6.0500e-003		216.2805
Total	**0.1313**	**0.9749**	**1.0147**	**4.2800e-003**	**0.2636**	**8.2300e-003**	**0.2718**	**0.0711**	**7.8300e-003**	**0.0789**		**437.9713**	**437.9713**	**0.0238**		**438.5664**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449	0.0000	2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**	**0.0000**	**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0267	0.9107	0.1707	2.1100e-003	0.0512	6.9200e-003	0.0582	0.0148	6.6200e-003	0.0214		221.8421	221.8421	0.0178		222.2859
Worker	0.1046	0.0642	0.8441	2.1700e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		216.1292	216.1292	6.0500e-003		216.2805
Total	**0.1313**	**0.9749**	**1.0147**	**4.2800e-003**	**0.2636**	**8.2300e-003**	**0.2718**	**0.0711**	**7.8300e-003**	**0.0789**		**437.9713**	**437.9713**	**0.0238**		**438.5664**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089		2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**		**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0223	0.8231	0.1506	2.0900e-003	0.0512	4.6800e-003	0.0559	0.0148	4.4800e-003	0.0192		220.3127	220.3127	0.0165		220.7259
Worker	0.0967	0.0572	0.7661	2.1000e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		209.3030	209.3030	5.3600e-003		209.4371
Total	**0.1190**	**0.8803**	**0.9167**	**4.1900e-003**	**0.2636**	**5.9700e-003**	**0.2696**	**0.0711**	**5.6600e-003**	**0.0767**		**429.6157**	**429.6157**	**0.0219**		**430.1629**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089	0.0000	2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**	**0.0000**	**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0223	0.8231	0.1506	2.0900e-003	0.0512	4.6800e-003	0.0559	0.0148	4.4800e-003	0.0192		220.3127	220.3127	0.0165		220.7259
Worker	0.0967	0.0572	0.7661	2.1000e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		209.3030	209.3030	5.3600e-003		209.4371
Total	**0.1190**	**0.8803**	**0.9167**	**4.1900e-003**	**0.2636**	**5.9700e-003**	**0.2696**	**0.0711**	**5.6600e-003**	**0.0767**		**429.6157**	**429.6157**	**0.0219**		**430.1629**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051		1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**		**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0451	0.6048	1.6600e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		165.2392	165.2392	4.2400e-003		165.3451
Total	**0.0763**	**0.0451**	**0.6048**	**1.6600e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**165.2392**	**165.2392**	**4.2400e-003**		**165.3451**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051	0.0000	1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**	**0.0000**	**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0451	0.6048	1.6600e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		165.2392	165.2392	4.2400e-003		165.3451
Total	**0.0763**	**0.0451**	**0.6048**	**1.6600e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**165.2392**	**165.2392**	**4.2400e-003**		**165.3451**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0204	0.0120	0.1613	4.4000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		44.0638	44.0638	1.1300e-003		44.0920
Total	**0.0204**	**0.0120**	**0.1613**	**4.4000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**44.0638**	**44.0638**	**1.1300e-003**		**44.0920**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0204	0.0120	0.1613	4.4000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		44.0638	44.0638	1.1300e-003		44.0920
Total	**0.0204**	**0.0120**	**0.1613**	**4.4000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**44.0638**	**44.0638**	**1.1300e-003**		**44.0920**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.8278	47.5717	42.8931	0.1475	7.3225	0.1202	7.4427	1.9594	0.1131	2.0725		15,142.2336	15,142.2336	1.4914		15,179.5177
Unmitigated	7.9267	48.5745	45.8825	0.1598	8.3021	0.1316	8.4337	2.2216	0.1238	2.3454		16,390.2894	16,390.2894	1.5273		16,428.4705

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant with Drive Thru	1,260.14	1,833.96	1378.51	1,430,223	1,261,457
Gasoline/Service Station	2,930.04	3,034.08	3034.08	1,914,344	1,688,451
Parking Lot	0.00	0.00	0.00		
Total	4,190.18	4,868.04	4,412.59	3,344,567	2,949,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant with Drive	16.60	8.40	6.90	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food Restaurant with Drive Thru	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Gasoline/Service Station	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Parking Lot	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
NaturalGas Unmitigated	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1905.09	0.0206	0.1868	0.1569	1.1200e-003		0.0142	0.0142		0.0142	0.0142		224.1283	224.1283	4.3000e-003	4.1100e-003	225.4601
Gasoline/Service Station	1286.43	0.0139	0.1261	0.1059	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3442	151.3442	2.9000e-003	2.7700e-003	152.2436
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0344**	**0.3129**	**0.2628**	**1.8800e-003**		**0.0238**	**0.0238**		**0.0238**	**0.0238**		**375.4725**	**375.4725**	**7.2000e-003**	**6.8800e-003**	**377.7037**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1.74275	0.0188	0.1709	0.1435	1.0300e-003		0.0130	0.0130		0.0130	0.0130		205.0293	205.0293	3.9300e-003	3.7600e-003	206.2477
Gasoline/Service Station	1.10397	0.0119	0.1082	0.0909	6.5000e-004		8.2300e-003	8.2300e-003		8.2300e-003	8.2300e-003		129.8793	129.8793	2.4900e-003	2.3800e-003	130.6512
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0307**	**0.2791**	**0.2344**	**1.6800e-003**		**0.0212**	**0.0212**		**0.0212**	**0.0212**		**334.9087**	**334.9087**	**6.4200e-003**	**6.1400e-003**	**336.8989**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Unmitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Kassab Travel Center

Riverside-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	78.00	Space	2.00	31,200.00	0
Fast Food Restaurant with Drive Thru	2.54	1000sqft	0.24	2,543.00	0
Gasoline/Service Station	18.00	Pump	0.60	14,452.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Kassab Travel Center - Riverside-South Coast County, Winter

Project Characteristics - Opening Year 2020

Land Use - 18-Pump, 14,452 SF Gas Sttion on 0.6 AC; 2.543 SF Fast Food Restaurant with Drive-Thru on 0.24 AC; and 78-space Parking Lot on 2 AC.

Construction Phase - 5 days Site Prep; 10 days Grading; 220 days Building Construction; 10 days Paving; and 10 days Painting.

Trips and VMT - To account for water trucks, 6 vendor trips added to Site Prep and Grading phases.

Grading -

Vehicle Trips - Gas Service Station Trip Rate of 162.78 obtained from the Traffic Impact Analysis revised by Dudek, August 2018.

Energy Use -

Sequestration - Required to plant 47 new miscellaneous trees.

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected.

Mobile Land Use Mitigation - Increase transit to nearest busstop (0.02 miles from the project site) and provide sidewalks onsite and connecting offsite.

Energy Mitigation - Exceed Title 24 by 30% and improve lighting efficiency by 25%.

Water Mitigation - Install low-flow fixtures and water-efficient irrigation systems.

Waste Mitigation - 50% reduction in waste.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	2,540.00	2,543.00
tblLandUse	LandUseSquareFeet	2,541.15	14,452.00
tblLandUse	LotAcreage	0.70	2.00
tblLandUse	LotAcreage	0.06	0.24
tblLandUse	LotAcreage	0.06	0.60
tblSequestration	NumberOfNewTrees	0.00	47.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblVehicleTrips	WD_TR	168.56	162.78

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6882	23.4608	16.1370	0.0290	6.7025	1.0985	7.7815	3.4082	1.0528	4.4010	0.0000	2,719.5946	2,719.5946	0.7847	0.0000	2,732.2442
2020	16.8846	18.3116	15.6932	0.0289	0.2636	0.9542	1.2178	0.0711	0.9146	0.9857	0.0000	2,688.6867	2,688.6867	0.5454	0.0000	2,700.8767
Maximum	**16.8846**	**23.4608**	**16.1370**	**0.0290**	**6.7025**	**1.0985**	**7.7815**	**3.4082**	**1.0528**	**4.4010**	**0.0000**	**2,719.5946**	**2,719.5946**	**0.7847**	**0.0000**	**2,732.2442**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6882	23.4608	16.1370	0.0290	2.7056	1.0985	3.7845	1.3540	1.0528	2.3468	0.0000	2,719.5946	2,719.5946	0.7847	0.0000	2,732.2442
2020	16.8846	18.3116	15.6932	0.0289	0.2636	0.9542	1.2178	0.0711	0.9146	0.9857	0.0000	2,688.6867	2,688.6867	0.5454	0.0000	2,700.8767
Maximum	**16.8846**	**23.4608**	**16.1370**	**0.0290**	**2.7056**	**1.0985**	**3.7845**	**1.3540**	**1.0528**	**2.3468**	**0.0000**	**2,719.5946**	**2,719.5946**	**0.7847**	**0.0000**	**2,732.2442**

Kassab Travel Center - Riverside-South Coast County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	57.38	0.00	44.41	59.04	0.00	38.13	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037
Mobile	6.5220	47.5069	45.0666	0.1458	8.3021	0.1354	8.4376	2.2216	0.1274	2.3490		14,957.6547	14,957.6547	1.6705		14,999.4164
Total	**6.9505**	**47.8198**	**45.3396**	**0.1477**	**8.3021**	**0.1592**	**8.4614**	**2.2216**	**0.1513**	**2.3729**		**15,333.1488**	**15,333.1488**	**1.6777**	**6.8800e-003**	**15,377.1432**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
Mobile	6.4298	46.4543	42.6746	0.1345	7.3225	0.1241	7.4466	1.9594	0.1167	2.0762		13,799.3952	13,799.3952	1.6373		13,840.3282
Total	**6.8545**	**46.7335**	**42.9192**	**0.1361**	**7.3225**	**0.1453**	**7.4678**	**1.9594**	**0.1380**	**2.0974**		**14,134.3254**	**14,134.3254**	**1.6438**	**6.1400e-003**	**14,177.2501**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	1.38	2.27	5.34	7.85	11.80	8.74	11.74	11.80	8.77	11.61	0.00	7.82	7.82	2.02	10.76	7.80

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2019	3/7/2019	5	5	
2	Grading	Grading	3/8/2019	3/21/2019	5	10	
3	Building Construction	Building Construction	3/22/2019	1/23/2020	5	220	
4	Paving	Paving	1/24/2020	2/6/2020	5	10	
5	Architectural Coating	Architectural Coating	2/7/2020	2/20/2020	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5

Acres of Paving: 2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 25,493; Non-Residential Outdoor: 8,498; Striped Parking Area: 1,872 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	19.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854		2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**1.5908**	**0.8537**	**2.4445**	**0.1718**	**0.7854**	**0.9572**		**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0430	0.0280	0.2880	8.2000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		81.6414	81.6414	2.2200e-003		81.6968
Total	**0.0640**	**0.7094**	**0.4369**	**2.3400e-003**	**0.1278**	**5.8000e-003**	**0.1337**	**0.0348**	**5.5300e-003**	**0.0403**		**241.8046**	**241.8046**	**0.0170**		**242.2297**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6204	0.0000	0.6204	0.0670	0.0000	0.0670			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854	0.0000	2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**0.6204**	**0.8537**	**1.4741**	**0.0670**	**0.7854**	**0.8524**	**0.0000**	**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0430	0.0280	0.2880	8.2000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		81.6414	81.6414	2.2200e-003		81.6968
Total	**0.0640**	**0.7094**	**0.4369**	**2.3400e-003**	**0.1278**	**5.8000e-003**	**0.1337**	**0.0348**	**5.5300e-003**	**0.0403**		**241.8046**	**241.8046**	**0.0170**		**242.2297**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871		2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**6.5523**	**1.0730**	**7.6253**	**3.3675**	**0.9871**	**4.3546**		**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0538	0.0350	0.3601	1.0200e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		102.0517	102.0517	2.7700e-003		102.1209
Total	**0.0748**	**0.7164**	**0.5089**	**2.5400e-003**	**0.1502**	**5.9400e-003**	**0.1562**	**0.0407**	**5.6600e-003**	**0.0464**		**262.2149**	**262.2149**	**0.0176**		**262.6539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5554	0.0000	2.5554	1.3133	0.0000	1.3133			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871	0.0000	2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**2.5554**	**1.0730**	**3.6284**	**1.3133**	**0.9871**	**2.3005**	**0.0000**	**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0538	0.0350	0.3601	1.0200e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		102.0517	102.0517	2.7700e-003		102.1209
Total	**0.0748**	**0.7164**	**0.5089**	**2.5400e-003**	**0.1502**	**5.9400e-003**	**0.1562**	**0.0407**	**5.6600e-003**	**0.0464**		**262.2149**	**262.2149**	**0.0176**		**262.6539**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449		2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**		**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0280	0.9086	0.1984	2.0300e-003	0.0512	7.0000e-003	0.0582	0.0148	6.7000e-003	0.0215		213.5509	213.5509	0.0197		214.0439
Worker	0.1022	0.0665	0.6841	1.9500e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		193.8983	193.8983	5.2600e-003		194.0298
Total	**0.1302**	**0.9751**	**0.8825**	**3.9800e-003**	**0.2636**	**8.3100e-003**	**0.2719**	**0.0711**	**7.9100e-003**	**0.0790**		**407.4492**	**407.4492**	**0.0250**		**408.0737**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449	0.0000	2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**	**0.0000**	**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0280	0.9086	0.1984	2.0300e-003	0.0512	7.0000e-003	0.0582	0.0148	6.7000e-003	0.0215		213.5509	213.5509	0.0197		214.0439
Worker	0.1022	0.0665	0.6841	1.9500e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		193.8983	193.8983	5.2600e-003		194.0298
Total	**0.1302**	**0.9751**	**0.8825**	**3.9800e-003**	**0.2636**	**8.3100e-003**	**0.2719**	**0.0711**	**7.9100e-003**	**0.0790**		**407.4492**	**407.4492**	**0.0250**		**408.0737**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089		2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**		**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0235	0.8188	0.1763	2.0100e-003	0.0512	4.7400e-003	0.0560	0.0148	4.5300e-003	0.0193		212.0342	212.0342	0.0184		212.4939
Worker	0.0947	0.0592	0.6197	1.8800e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		187.7648	187.7648	4.6600e-003		187.8814
Total	**0.1182**	**0.8780**	**0.7961**	**3.8900e-003**	**0.2636**	**6.0300e-003**	**0.2696**	**0.0711**	**5.7100e-003**	**0.0768**		**399.7990**	**399.7990**	**0.0231**		**400.3753**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089	0.0000	2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**	**0.0000**	**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0235	0.8188	0.1763	2.0100e-003	0.0512	4.7400e-003	0.0560	0.0148	4.5300e-003	0.0193		212.0342	212.0342	0.0184		212.4939
Worker	0.0947	0.0592	0.6197	1.8800e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		187.7648	187.7648	4.6600e-003		187.8814
Total	**0.1182**	**0.8780**	**0.7961**	**3.8900e-003**	**0.2636**	**6.0300e-003**	**0.2696**	**0.0711**	**5.7100e-003**	**0.0768**		**399.7990**	**399.7990**	**0.0231**		**400.3753**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051		1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**		**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0748	0.0467	0.4893	1.4900e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		148.2354	148.2354	3.6800e-003		148.3274
Total	**0.0748**	**0.0467**	**0.4893**	**1.4900e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**148.2354**	**148.2354**	**3.6800e-003**		**148.3274**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051	0.0000	1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**	**0.0000**	**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0748	0.0467	0.4893	1.4900e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		148.2354	148.2354	3.6800e-003		148.3274
Total	**0.0748**	**0.0467**	**0.4893**	**1.4900e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**148.2354**	**148.2354**	**3.6800e-003**		**148.3274**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0199	0.0125	0.1305	4.0000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		39.5294	39.5294	9.8000e-004		39.5540
Total	**0.0199**	**0.0125**	**0.1305**	**4.0000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**39.5294**	**39.5294**	**9.8000e-004**		**39.5540**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0199	0.0125	0.1305	4.0000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		39.5294	39.5294	9.8000e-004		39.5540
Total	**0.0199**	**0.0125**	**0.1305**	**4.0000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**39.5294**	**39.5294**	**9.8000e-004**		**39.5540**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.4298	46.4543	42.6746	0.1345	7.3225	0.1241	7.4466	1.9594	0.1167	2.0762		13,799.3952	13,799.3952	1.6373		13,840.3282
Unmitigated	6.5220	47.5069	45.0666	0.1458	8.3021	0.1354	8.4376	2.2216	0.1274	2.3490		14,957.6547	14,957.6547	1.6705		14,999.4164

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant with Drive Thru	1,260.14	1,833.96	1378.51	1,430,223	1,261,457
Gasoline/Service Station	2,930.04	3,034.08	3034.08	1,914,344	1,688,451
Parking Lot	0.00	0.00	0.00		
Total	4,190.18	4,868.04	4,412.59	3,344,567	2,949,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant with Drive	16.60	8.40	6.90	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food Restaurant with Drive Thru	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Gasoline/Service Station	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Parking Lot	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
NaturalGas Unmitigated	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1905.09	0.0206	0.1868	0.1569	1.1200e-003		0.0142	0.0142		0.0142	0.0142		224.1283	224.1283	4.3000e-003	4.1100e-003	225.4601
Gasoline/Service Station	1286.43	0.0139	0.1261	0.1059	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3442	151.3442	2.9000e-003	2.7700e-003	152.2436
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0344**	**0.3129**	**0.2628**	**1.8800e-003**		**0.0238**	**0.0238**		**0.0238**	**0.0238**		**375.4725**	**375.4725**	**7.2000e-003**	**6.8800e-003**	**377.7037**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1.74275	0.0188	0.1709	0.1435	1.0300e-003		0.0130	0.0130		0.0130	0.0130		205.0293	205.0293	3.9300e-003	3.7600e-003	206.2477
Gasoline/Service Station	1.10397	0.0119	0.1082	0.0909	6.5000e-004		8.2300e-003	8.2300e-003		8.2300e-003	8.2300e-003		129.8793	129.8793	2.4900e-003	2.3800e-003	130.6512
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0307**	**0.2791**	**0.2344**	**1.6800e-003**		**0.0212**	**0.0212**		**0.0212**	**0.0212**		**334.9087**	**334.9087**	**6.4200e-003**	**6.1400e-003**	**336.8989**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Unmitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B

CalEEMod Model Year 2020 Annual Printouts

Kassab Travel Center

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	78.00	Space	2.00	31,200.00	0
Fast Food Restaurant with Drive Thru	2.54	1000sqft	0.24	2,543.00	0
Gasoline/Service Station	18.00	Pump	0.60	14,452.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Opening Year 2020

Land Use - 18-Pump, 14,452 SF Gas Sttion on 0.6 AC; 2.543 SF Fast Food Restaurant with Drive-Thru on 0.24 AC; and 78-space Parking Lot on 2 AC.

Construction Phase - 5 days Site Prep; 10 days Grading; 220 days Building Construction; 10 days Paving; and 10 days Painting.

Trips and VMT - To account for water trucks, 6 vendor trips added to Site Prep and Grading phases.

Grading -

Vehicle Trips - Gas Service Station Trip Rate of 162.78 obtained from the Traffic Impact Analysis revised by Dudek, August 2018.

Energy Use -

Sequestration - Required to plant 47 new miscellaneous trees.

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected.

Mobile Land Use Mitigation - Increase transit to nearest busstop (0.02 miles from the project site) and provide sidewalks onsite and connecting offsite.

Energy Mitigation - Exceed Title 24 by 30% and improve lighting efficiency by 25%.

Water Mitigation - Install low-flow fixtures and water-efficient irrigation systems.

Waste Mitigation - 50% reduction in waste.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	2,540.00	2,543.00
tblLandUse	LandUseSquareFeet	2,541.15	14,452.00
tblLandUse	LotAcreage	0.70	2.00
tblLandUse	LotAcreage	0.06	0.24
tblLandUse	LotAcreage	0.06	0.60
tblSequestration	NumberOfNewTrees	0.00	47.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblVehicleTrips	WD_TR	168.56	162.78

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2870	2.1931	1.7244	3.1400e-003	0.0641	0.1190	0.1832	0.0247	0.1138	0.1385	0.0000	267.8615	267.8615	0.0513	0.0000	269.1437
2020	0.1135	0.2224	0.2050	3.6000e-004	3.2500e-003	0.0120	0.0152	8.7000e-004	0.0114	0.0122	0.0000	30.7101	30.7101	6.3300e-003	0.0000	30.8683
Maximum	**0.2870**	**2.1931**	**1.7244**	**3.1400e-003**	**0.0641**	**0.1190**	**0.1832**	**0.0247**	**0.1138**	**0.1385**	**0.0000**	**267.8615**	**267.8615**	**0.0513**	**0.0000**	**269.1437**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2870	2.1931	1.7244	3.1400e-003	0.0417	0.1190	0.1607	0.0141	0.1138	0.1279	0.0000	267.8612	267.8612	0.0513	0.0000	269.1434
2020	0.1135	0.2224	0.2050	3.6000e-004	3.2500e-003	0.0120	0.0152	8.7000e-004	0.0114	0.0122	0.0000	30.7100	30.7100	6.3300e-003	0.0000	30.8683
Maximum	**0.2870**	**2.1931**	**1.7244**	**3.1400e-003**	**0.0417**	**0.1190**	**0.1607**	**0.0141**	**0.1138**	**0.1279**	**0.0000**	**267.8612**	**267.8612**	**0.0513**	**0.0000**	**269.1434**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**33.26**	**0.00**	**11.30**	**41.25**	**0.00**	**6.99**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**3-1-2019**	**5-31-2019**	0.7604	0.7604
2	**6-1-2019**	**8-31-2019**	0.7417	0.7417
3	**9-1-2019**	**11-30-2019**	0.7336	0.7336
4	**12-1-2019**	**2-29-2020**	0.5799	0.5799
		Highest	0.7604	0.7604

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Energy	6.2800e-003	0.0571	0.0480	3.4000e-004		4.3400e-003	4.3400e-003		4.3400e-003	4.3400e-003	0.0000	150.8518	150.8518	4.8500e-003	1.9000e-003	151.5385
Mobile	1.0433	7.7807	7.1283	0.0239	1.2771	0.0210	1.2981	0.3422	0.0198	0.3620	0.0000	2,224.2817	2,224.2817	0.2309	0.0000	2,230.0542
Waste						0.0000	0.0000		0.0000	0.0000	7.9085	0.0000	7.9085	0.4674	0.0000	19.5930
Water						0.0000	0.0000		0.0000	0.0000	0.3204	4.8834	5.2038	0.0331	8.2000e-004	6.2757
Total	**1.1215**	**7.8378**	**7.1775**	**0.0242**	**1.2771**	**0.0253**	**1.3024**	**0.3422**	**0.0241**	**0.3663**	**8.2290**	**2,380.0193**	**2,388.2482**	**0.7363**	**2.7200e-003**	**2,407.4640**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Energy	5.6000e-003	0.0509	0.0428	3.1000e-004		3.8700e-003	3.8700e-003		3.8700e-003	3.8700e-003	0.0000	132.5038	132.5038	4.2400e-003	1.6700e-003	133.1090
Mobile	1.0286	7.6141	6.7334	0.0221	1.1264	0.0192	1.1456	0.3018	0.0181	0.3199	0.0000	2,057.3113	2,057.3113	0.2261	0.0000	2,062.9643
Waste						0.0000	0.0000		0.0000	0.0000	3.9543	0.0000	3.9543	0.2337	0.0000	9.7965
Water						0.0000	0.0000		0.0000	0.0000	0.2705	4.1874	4.4578	0.0280	6.9000e-004	5.3627
Total	**1.1061**	**7.6650**	**6.7775**	**0.0224**	**1.1264**	**0.0231**	**1.1495**	**0.3018**	**0.0220**	**0.3238**	**4.2247**	**2,194.0050**	**2,198.2297**	**0.4920**	**2.3600e-003**	**2,211.2351**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**1.37**	**2.20**	**5.57**	**7.59**	**11.80**	**8.84**	**11.74**	**11.80**	**8.88**	**11.61**	**48.66**	**7.82**	**7.96**	**33.17**	**13.24**	**8.15**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	33.2760
Total	**33.2760**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2019	3/7/2019	5	5	
2	Grading	Grading	3/8/2019	3/21/2019	5	10	
3	Building Construction	Building Construction	3/22/2019	1/23/2020	5	220	
4	Paving	Paving	1/24/2020	2/6/2020	5	10	
5	Architectural Coating	Architectural Coating	2/7/2020	2/20/2020	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5

Acres of Paving: 2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 25,493; Non-Residential Outdoor: 8,498; Striped Parking Area: 1,872 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	19.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9800e-003	0.0000	3.9800e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	**4.3900e-003**	**0.0539**	**0.0298**	**6.0000e-005**	**3.9800e-003**	**2.1300e-003**	**6.1100e-003**	**4.3000e-004**	**1.9600e-003**	**2.3900e-003**	**0.0000**	**5.5033**	**5.5033**	**1.7400e-003**	**0.0000**	**5.5468**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.7300e-003	3.4000e-004	0.0000	9.0000e-005	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3714	0.3714	3.0000e-005	0.0000	0.3722
Worker	1.0000e-004	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1899	0.1899	1.0000e-005	0.0000	0.1901
Total	**1.5000e-004**	**1.8000e-003**	**1.1000e-003**	**0.0000**	**3.1000e-004**	**1.0000e-005**	**3.3000e-004**	**9.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.5613**	**0.5613**	**4.0000e-005**	**0.0000**	**0.5623**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5500e-003	0.0000	1.5500e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	**4.3900e-003**	**0.0539**	**0.0298**	**6.0000e-005**	**1.5500e-003**	**2.1300e-003**	**3.6800e-003**	**1.7000e-004**	**1.9600e-003**	**2.1300e-003**	**0.0000**	**5.5033**	**5.5033**	**1.7400e-003**	**0.0000**	**5.5468**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.7300e-003	3.4000e-004	0.0000	9.0000e-005	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3714	0.3714	3.0000e-005	0.0000	0.3722
Worker	1.0000e-004	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1899	0.1899	1.0000e-005	0.0000	0.1901
Total	**1.5000e-004**	**1.8000e-003**	**1.1000e-003**	**0.0000**	**3.1000e-004**	**1.0000e-005**	**3.3000e-004**	**9.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.5613**	**0.5613**	**4.0000e-005**	**0.0000**	**0.5623**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0328	0.0000	0.0328	0.0168	0.0000	0.0168	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0101	0.1137	0.0508	1.0000e-004		5.3600e-003	5.3600e-003		4.9400e-003	4.9400e-003	0.0000	9.2590	9.2590	2.9300e-003	0.0000	9.3322
Total	**0.0101**	**0.1137**	**0.0508**	**1.0000e-004**	**0.0328**	**5.3600e-003**	**0.0381**	**0.0168**	**4.9400e-003**	**0.0218**	**0.0000**	**9.2590**	**9.2590**	**2.9300e-003**	**0.0000**	**9.3322**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	3.4600e-003	6.9000e-004	1.0000e-005	1.9000e-004	3.0000e-005	2.2000e-004	5.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.7429	0.7429	6.0000e-005	0.0000	0.7444
Worker	2.5000e-004	1.8000e-004	1.9000e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4748	0.4748	1.0000e-005	0.0000	0.4751
Total	**3.5000e-004**	**3.6400e-003**	**2.5900e-003**	**2.0000e-005**	**7.4000e-004**	**3.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**1.2177**	**1.2177**	**7.0000e-005**	**0.0000**	**1.2196**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0128	0.0000	0.0128	6.5700e-003	0.0000	6.5700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0101	0.1137	0.0508	1.0000e-004		5.3600e-003	5.3600e-003		4.9400e-003	4.9400e-003	0.0000	9.2590	9.2590	2.9300e-003	0.0000	9.3322
Total	**0.0101**	**0.1137**	**0.0508**	**1.0000e-004**	**0.0128**	**5.3600e-003**	**0.0181**	**6.5700e-003**	**4.9400e-003**	**0.0115**	**0.0000**	**9.2590**	**9.2590**	**2.9300e-003**	**0.0000**	**9.3322**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	3.4600e-003	6.9000e-004	1.0000e-005	1.9000e-004	3.0000e-005	2.2000e-004	5.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.7429	0.7429	6.0000e-005	0.0000	0.7444
Worker	2.5000e-004	1.8000e-004	1.9000e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4748	0.4748	1.0000e-005	0.0000	0.4751
Total	**3.5000e-004**	**3.6400e-003**	**2.5900e-003**	**2.0000e-005**	**7.4000e-004**	**3.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**1.2177**	**1.2177**	**7.0000e-005**	**0.0000**	**1.2196**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2596	1.9194	1.5483	2.5400e-003		0.1107	0.1107		0.1061	0.1061	0.0000	212.9006	212.9006	0.0443	0.0000	214.0079
Total	**0.2596**	**1.9194**	**1.5483**	**2.5400e-003**		**0.1107**	**0.1107**		**0.1061**	**0.1061**	**0.0000**	**212.9006**	**212.9006**	**0.0443**	**0.0000**	**214.0079**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7500e-003	0.0937	0.0187	2.1000e-004	5.1300e-003	7.1000e-004	5.8300e-003	1.4800e-003	6.8000e-004	2.1500e-003	0.0000	20.1064	20.1064	1.7100e-003	0.0000	20.1492
Worker	9.5800e-003	6.9800e-003	0.0732	2.0000e-004	0.0212	1.3000e-004	0.0213	5.6300e-003	1.2000e-004	5.7500e-003	0.0000	18.3132	18.3132	5.0000e-004	0.0000	18.3257
Total	**0.0123**	**0.1007**	**0.0918**	**4.1000e-004**	**0.0263**	**8.4000e-004**	**0.0272**	**7.1100e-003**	**8.0000e-004**	**7.9000e-003**	**0.0000**	**38.4196**	**38.4196**	**2.2100e-003**	**0.0000**	**38.4750**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2596	1.9194	1.5483	2.5400e-003		0.1107	0.1107		0.1061	0.1061	0.0000	212.9004	212.9004	0.0443	0.0000	214.0076
Total	**0.2596**	**1.9194**	**1.5483**	**2.5400e-003**		**0.1107**	**0.1107**		**0.1061**	**0.1061**	**0.0000**	**212.9004**	**212.9004**	**0.0443**	**0.0000**	**214.0076**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7500e-003	0.0937	0.0187	2.1000e-004	5.1300e-003	7.1000e-004	5.8300e-003	1.4800e-003	6.8000e-004	2.1500e-003	0.0000	20.1064	20.1064	1.7100e-003	0.0000	20.1492
Worker	9.5800e-003	6.9800e-003	0.0732	2.0000e-004	0.0212	1.3000e-004	0.0213	5.6300e-003	1.2000e-004	5.7500e-003	0.0000	18.3132	18.3132	5.0000e-004	0.0000	18.3257
Total	**0.0123**	**0.1007**	**0.0918**	**4.1000e-004**	**0.0263**	**8.4000e-004**	**0.0272**	**7.1100e-003**	**8.0000e-004**	**7.9000e-003**	**0.0000**	**38.4196**	**38.4196**	**2.2100e-003**	**0.0000**	**38.4750**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0195	0.1482	0.1266	2.1000e-004		8.0600e-003	8.0600e-003		7.7300e-003	7.7300e-003	0.0000	17.6498	17.6498	3.5800e-003	0.0000	17.7393
Total	**0.0195**	**0.1482**	**0.1266**	**2.1000e-004**		**8.0600e-003**	**8.0600e-003**		**7.7300e-003**	**7.7300e-003**	**0.0000**	**17.6498**	**17.6498**	**3.5800e-003**	**0.0000**	**17.7393**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.0700e-003	1.3800e-003	2.0000e-005	4.3000e-004	4.0000e-005	4.7000e-004	1.2000e-004	4.0000e-005	1.6000e-004	0.0000	1.6720	1.6720	1.3000e-004	0.0000	1.6754
Worker	7.4000e-004	5.2000e-004	5.5500e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.7900e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4851	1.4851	4.0000e-005	0.0000	1.4861
Total	**9.3000e-004**	**7.5900e-003**	**6.9300e-003**	**4.0000e-005**	**2.2100e-003**	**5.0000e-005**	**2.2600e-003**	**5.9000e-004**	**5.0000e-005**	**6.4000e-004**	**0.0000**	**3.1572**	**3.1572**	**1.7000e-004**	**0.0000**	**3.1615**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0195	0.1482	0.1266	2.1000e-004		8.0600e-003	8.0600e-003		7.7300e-003	7.7300e-003	0.0000	17.6498	17.6498	3.5800e-003	0.0000	17.7393
Total	**0.0195**	**0.1482**	**0.1266**	**2.1000e-004**		**8.0600e-003**	**8.0600e-003**		**7.7300e-003**	**7.7300e-003**	**0.0000**	**17.6498**	**17.6498**	**3.5800e-003**	**0.0000**	**17.7393**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.0700e-003	1.3800e-003	2.0000e-005	4.3000e-004	4.0000e-005	4.7000e-004	1.2000e-004	4.0000e-005	1.6000e-004	0.0000	1.6720	1.6720	1.3000e-004	0.0000	1.6754
Worker	7.4000e-004	5.2000e-004	5.5500e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.7900e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4851	1.4851	4.0000e-005	0.0000	1.4861
Total	**9.3000e-004**	**7.5900e-003**	**6.9300e-003**	**4.0000e-005**	**2.2100e-003**	**5.0000e-005**	**2.2600e-003**	**5.9000e-004**	**5.0000e-005**	**6.4000e-004**	**0.0000**	**3.1572**	**3.1572**	**1.7000e-004**	**0.0000**	**3.1615**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7700e-003	0.0579	0.0590	9.0000e-005		3.2800e-003	3.2800e-003		3.0300e-003	3.0300e-003	0.0000	7.7529	7.7529	2.4600e-003	0.0000	7.8143
Paving	2.6200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3900e-003**	**0.0579**	**0.0590**	**9.0000e-005**		**3.2800e-003**	**3.2800e-003**		**3.0300e-003**	**3.0300e-003**	**0.0000**	**7.7529**	**7.7529**	**2.4600e-003**	**0.0000**	**7.8143**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.4000e-004	2.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.6897	0.6897	2.0000e-005	0.0000	0.6901
Total	**3.4000e-004**	**2.4000e-004**	**2.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6897**	**0.6897**	**2.0000e-005**	**0.0000**	**0.6901**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7700e-003	0.0579	0.0590	9.0000e-005		3.2800e-003	3.2800e-003		3.0300e-003	3.0300e-003	0.0000	7.7529	7.7529	2.4600e-003	0.0000	7.8143
Paving	2.6200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3900e-003**	**0.0579**	**0.0590**	**9.0000e-005**		**3.2800e-003**	**3.2800e-003**		**3.0300e-003**	**3.0300e-003**	**0.0000**	**7.7529**	**7.7529**	**2.4600e-003**	**0.0000**	**7.8143**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.4000e-004	2.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.6897	0.6897	2.0000e-005	0.0000	0.6901
Total	**3.4000e-004**	**2.4000e-004**	**2.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6897**	**0.6897**	**2.0000e-005**	**0.0000**	**0.6901**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2100e-003	8.4200e-003	9.1600e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.2766	1.2766	1.0000e-004	0.0000	1.2791
Total	**0.0843**	**8.4200e-003**	**9.1600e-003**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.0000e-004**	**0.0000**	**1.2791**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	6.9000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1839	0.1839	0.0000	0.0000	0.1840
Total	**9.0000e-005**	**6.0000e-005**	**6.9000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1839**	**0.1839**	**0.0000**	**0.0000**	**0.1840**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2100e-003	8.4200e-003	9.1600e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.2766	1.2766	1.0000e-004	0.0000	1.2791
Total	**0.0843**	**8.4200e-003**	**9.1600e-003**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.0000e-004**	**0.0000**	**1.2791**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	6.9000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1839	0.1839	0.0000	0.0000	0.1840
Total	**9.0000e-005**	**6.0000e-005**	**6.9000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1839**	**0.1839**	**0.0000**	**0.0000**	**0.1840**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0286	7.6141	6.7334	0.0221	1.1264	0.0192	1.1456	0.3018	0.0181	0.3199	0.0000	2,057.3113	2,057.3113	0.2261	0.0000	2,062.9643
Unmitigated	1.0433	7.7807	7.1283	0.0239	1.2771	0.0210	1.2981	0.3422	0.0198	0.3620	0.0000	2,224.2817	2,224.2817	0.2309	0.0000	2,230.0542

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant with Drive Thru	1,260.14	1,833.96	1378.51	1,430,223	1,261,457
Gasoline/Service Station	2,930.04	3,034.08	3034.08	1,914,344	1,688,451
Parking Lot	0.00	0.00	0.00		
Total	4,190.18	4,868.04	4,412.59	3,344,567	2,949,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant with Drive	16.60	8.40	6.90	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food Restaurant with Drive Thru	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Gasoline/Service Station	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Parking Lot	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	77.0559	77.0559	3.1800e-003	6.6000e-004	77.3316
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	88.6881	88.6881	3.6600e-003	7.6000e-004	89.0054
NaturalGas Mitigated	5.6000e-003	0.0509	0.0428	3.1000e-004		3.8700e-003	3.8700e-003		3.8700e-003	3.8700e-003	0.0000	55.4479	55.4479	1.0600e-003	1.0200e-003	55.7774
NaturalGas Unmitigated	6.2800e-003	0.0571	0.0480	3.4000e-004		4.3400e-003	4.3400e-003		4.3400e-003	4.3400e-003	0.0000	62.1637	62.1637	1.1900e-003	1.1400e-003	62.5331

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant with Drive Thru	695358	3.7500e-003	0.0341	0.0286	2.0000e-004		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	37.1070	37.1070	7.1000e-004	6.8000e-004	37.3275
Gasoline/Service Station	469545	2.5300e-003	0.0230	0.0193	1.4000e-004		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	25.0567	25.0567	4.8000e-004	4.6000e-004	25.2056
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**6.2800e-003**	**0.0571**	**0.0480**	**3.4000e-004**		**4.3400e-003**	**4.3400e-003**		**4.3400e-003**	**4.3400e-003**	**0.0000**	**62.1637**	**62.1637**	**1.1900e-003**	**1.1400e-003**	**62.5331**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant with Drive Thru	636103	3.4300e-003	0.0312	0.0262	1.9000e-004		2.3700e-003	2.3700e-003		2.3700e-003	2.3700e-003	0.0000	33.9449	33.9449	6.5000e-004	6.2000e-004	34.1466
Gasoline/Service Station	402951	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003	0.0000	21.5030	21.5030	4.1000e-004	3.9000e-004	21.6308
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.6000e-003**	**0.0509**	**0.0428**	**3.1000e-004**		**3.8700e-003**	**3.8700e-003**		**3.8700e-003**	**3.8700e-003**	**0.0000**	**55.4479**	**55.4479**	**1.0600e-003**	**1.0100e-003**	**55.7774**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant with Drive Thru	120742	38.4709	1.5900e-003	3.3000e-004	38.6085
Gasoline/Service Station	146688	46.7379	1.9300e-003	4.0000e-004	46.9051
Parking Lot	10920	3.4794	1.4000e-004	3.0000e-005	3.4918
Total		**88.6881**	**3.6600e-003**	**7.6000e-004**	**89.0054**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant with Drive Thru	107088	34.1206	1.4100e-003	2.9000e-004	34.2427
Gasoline/Service Station	126563	40.3258	1.6600e-003	3.4000e-004	40.4701
Parking Lot	8190	2.6095	1.1000e-004	2.0000e-005	2.6189
Total		**77.0559**	**3.1800e-003**	**6.5000e-004**	**77.3316**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Unmitigated	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0634					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Total	**0.0719**	**1.0000e-005**	**1.2700e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.4500e-003**	**2.4500e-003**	**1.0000e-005**	**0.0000**	**2.6100e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0634					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Total	**0.0719**	**1.0000e-005**	**1.2700e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.4500e-003**	**2.4500e-003**	**1.0000e-005**	**0.0000**	**2.6100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	4.4578	0.0280	6.9000e-004	5.3627
Unmitigated	5.2038	0.0331	8.2000e-004	6.2757

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant with Drive Thru	0.770976 / 0.0492112	3.6174	0.0253	6.2000e-004	4.4343
Gasoline/Service Station	0.239074 / 0.146529	1.5864	7.8500e-003	2.0000e-004	1.8414
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**5.2038**	**0.0331**	**8.2000e-004**	**6.2757**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant with Drive Thru	0.650703 / 0.0462093	3.0696	0.0213	5.3000e-004	3.7592
Gasoline/Service Station	0.201778 / 0.137591	1.3882	6.6300e-003	1.7000e-004	1.6036
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**4.4578**	**0.0280**	**7.0000e-004**	**5.3627**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.9543	0.2337	0.0000	9.7965
Unmitigated	7.9085	0.4674	0.0000	19.5930

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant with Drive Thru	29.26	5.9395	0.3510	0.0000	14.7149
Gasoline/Service Station	9.7	1.9690	0.1164	0.0000	4.8781
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**7.9085**	**0.4674**	**0.0000**	**19.5930**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant with Drive Thru	14.63	2.9698	0.1755	0.0000	7.3575
Gasoline/Service Station	4.85	0.9845	0.0582	0.0000	2.4391
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**3.9543**	**0.2337**	**0.0000**	**9.7965**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	33.2760	0.0000	0.0000	33.2760

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	47	33.2760	0.0000	0.0000	33.2760
Total		**33.2760**	**0.0000**	**0.0000**	**33.2760**

Appendix B

Habitat Assessment

Habitat Assessment for
Kassab Travel Center
Assessor Parcel Numbers: 378-030-007, 378-030-009, and portions of 378-030-029 and 378-030-031 (Impact Area: 2.84 Acres; Total Area Surveyed: 2.84 Acres) in the City of Lake Elsinore, Riverside County, California
Elsinore USGS 7.5-Minute Series Map
Township 5 South, Range 4 West Section 31 and Range 5 West Section 36

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Surveys Conducted By:
Allison D. Rudalevige

Surveys Conducted On:
June 14, 2017

Report Date:
July 24, 2017
Revised March 15, 2018
Revised April 17, 2018

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: 4/17/2018 SIGNED: Allison D. Rudalevige

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SECTION 1.0

COUNTY OF RIVERSIDE ATTACHMENTS

Attachment E-3

BIOLOGICAL REPORT SUMMARY SHEET

(Submit two copies to the County)

Applicant Name: Environmental Advisors
Assessor's Parcel Number (APN): 378-030-007, -009, -029, -031
APN cont. : _____
Site Location: Section: 31 and 36 **Township:** 5 South **Range:** 4 and 5 West
Site Address: 29301 Riverside Drive, Lake Elsinore, CA 92530
Related Case Number(s): _____ **PDB Number:** _____

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
	Arroyo Southwestern Toad	Yes	No	N/A
✓	Blueline Stream(s)	Yes	(No)	N/A
	Coachella Valley Fringed-Toed Lizard	Yes	No	N/A
	Coastal California Gnatcatcher	Yes	No	N/A
	Coastal Sage Scrub	Yes	No	N/A
	Delhi Sands Flower-Loving Fly	Yes	No	N/A
	Desert Pupfish	Yes	No	N/A
	Desert Slender Salamander	Yes	No	N/A
	Desert Tortoise	Yes	No	N/A
	Flat-Tailed Horned Lizard	Yes	No	N/A
	Least Bell's Vireo	Yes	No	N/A
	Oak Woodlands	Yes	No	N/A
	Quino Checkerspot Butterfly	Yes	No	N/A
✓	Riverside Fairy Shrimp	Yes	(No)	N/A
	Santa Ana River Woolystar	Yes	No	N/A
	San Bernardino Kangaroo Rat	Yes	No	N/A
	Slender Horned Spineflower	Yes	No	N/A
	Stephen's Kangaroo Rat	Yes	No	N/A
✓	Vernal Pools	Yes	(No)	N/A
✓	Wetlands	Yes	(No)	N/A

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
✓	Other: Riparian Habitat	Yes	(No)	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened or candidate species by either State, or Federal regulations, or for Riverside County as listed by the California Department of Fish and Game Natural Diversity Data Base (NDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report.

Allison D. Rudaleng — 3/16/2018

Signature and Company Name — Report Date

10(a) Permit Number (if applicable) — Permit Expiration Date

County Use Only

Received by:_____ **Date:**_____

PD-B#_____

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit Two Copies)

Case Number: _____ Lot/Parcel No. 378-030-007, -009, -029, -031 **EA Number**_____

Wildlife & Vegetation

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

(Check the level of impact the applies to the following questions)

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?
☐ ☐ ☑ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?
☐ ☐ ☐ ☑

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U. S. Wildlife Service?
☐ ☐ ☑ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?
☐ ☐ ☑ ☐

e) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?
☐ ☐ ☐ ☑

f) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
☐ ☐ ☐ ☑

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
☐ ☐ ☐ ☑

Source: CGP Fig. VI.36-VI.40

Findings of Fact:
1. No Riparian/Riverine Resources, vernal pools, jurisdictional waters under the regulatory authority of the USACE and/or the CDFW would be impacted by the proposed project. Riparian habitat is adjacent to the west.
2. Nests of raptors and migratory birds may be impacted by the proposed project.

Proposed Mitigation:
1. Follow guidelines in Section 6.1.4 for Urban/Wildland Interface issues and in Section 7.5.3 for construction minimization measures.

Monitoring Recommended:
1. A pre-construction survey(s) for nesting birds and raptors is needed prior to any construction activities that occur during the nesting season (generally February 1 through June 30).

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Biological Resources Map

Attachment E-5

Kassab Travel Center

N
W E
S

100 50 0 100

Feet

PSOMAS

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Ruderal vegetation in the southwest corner of the survey area, facing northwest.

Ruderal vegetation (background) and bare ground (foreground) in the northeast corner of the survey area, facing southwest.

Ornamental trees in the center of the survey area.

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Representative Photographs

Attachment E-6

Kassab Travel Center

PSOMAS

SECTION 2.0

HABITAT ASSESSMENT

This report presents the findings of a habitat assessment for the Kassab Travel Center project (hereinafter referred to as the "proposed project") located in the City of Lake Elsinore in Riverside County, California. The proposed project consists of a proposed travel center that includes a 6,000-square-foot convenience store with 3 quick serve restaurants; 2 covered gas-dispensing areas totaling 5,264 square feet; and a free-standing, 2,543-square-foot fast food restaurant with drive through.

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) requires that project sites be evaluated for a number of factors to assess how they meet MSHCP criteria. This information is used to determine whether a project site should be acquired as part of the habitat reserve or whether it should be allowed for development. The biological resources evaluation also assists the Lead Agency in determining whether additional mitigation would be required for Criteria Area or Additional Survey Needs Species. According to the Riverside County Integrated Project (RCIP) Conservation Summary Report Generator, the proposed project is located in designated MSHCP "Criteria Area" Cell 4266. The general habitat assessment for the proposed project includes assessments for riparian/riverine areas (and associated species) and vernal pools (and associated species) pursuant to MSHCP Section 6.1.2; urban/wildlands interface issues pursuant to MSHCP Section 6.1.4; and areas under the jurisdictions of the U.S. Army Corps of Engineers (USACE) and/or the California Department of Fish and Wildlife (CDFW) as discussed in MSHCP Section 6.1.2. This report has been prepared in accordance with the MSHCP guidelines.

GENERAL SITE INFORMATION

The proposed project is located at the southwest corner of Collier Avenue and Riverside Drive in the City of Lake Elsinore in Riverside County, California (Exhibit 1). The 2.84-acre survey area consists of Assessor Parcel Numbers (APNs) 378-030-007, 378-030-009, and portions of 378-030-029 and 378-030-031. It is on the U.S. Geological Survey's (USGS') Elsinore 7.5-minute quadrangle at Township 5 South, Range 4 West, Section 31 and Range 5 West, Section 36 (Exhibit 2). Topography in the survey area is flat with elevations ranging from approximately 1,262 to 1,268 feet above mean sea level. Two soil types, Garretson very fine sandy loam (0 to 2 percent slopes) and Pachappa fine sandy loam (0 to 2 percent slopes) occur in the survey area (Exhibit 3). Surrounding land uses consist of undeveloped open space and commercial development. Alberhill Creek occurs less than 1,000 feet west of the survey area.

MSHCP Elsinore Area Plan (Subunit 3 – Elsinore)

The survey area is partially located in Subunit 3 (Elsinore) of the Western Riverside County MSHCP's Elsinore Area Plan (Dudek 2003). The target conservation acreage range for the Elsinore Area Plan is 66,500 to 73,315 acres, the target acreage for Additional Reserve Lands within Subunit 3 is 925 to 1,815 acres, and the target acreage within the City of Lake Elsinore is 4,830 to 7,870 acres.

The Elsinore Area Plan contains the following Cores and Linkages:

- All of Proposed Constrained Linkage 5
- All of Proposed Constrained Linkage 6
- Most of Proposed Core 1
- A portion of Proposed Extension of Existing Core 2
- All of Proposed Extension of Existing Core 3
- All of Proposed Linkage 1
- All of Proposed Linkage 2
- A portion of Proposed Linkage 3

Aerial Source: Esri 2016

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Project Location

Exhibit 1

Kassab Travel Center

N
W E
S

200 100 0 200

Feet

PSOMAS

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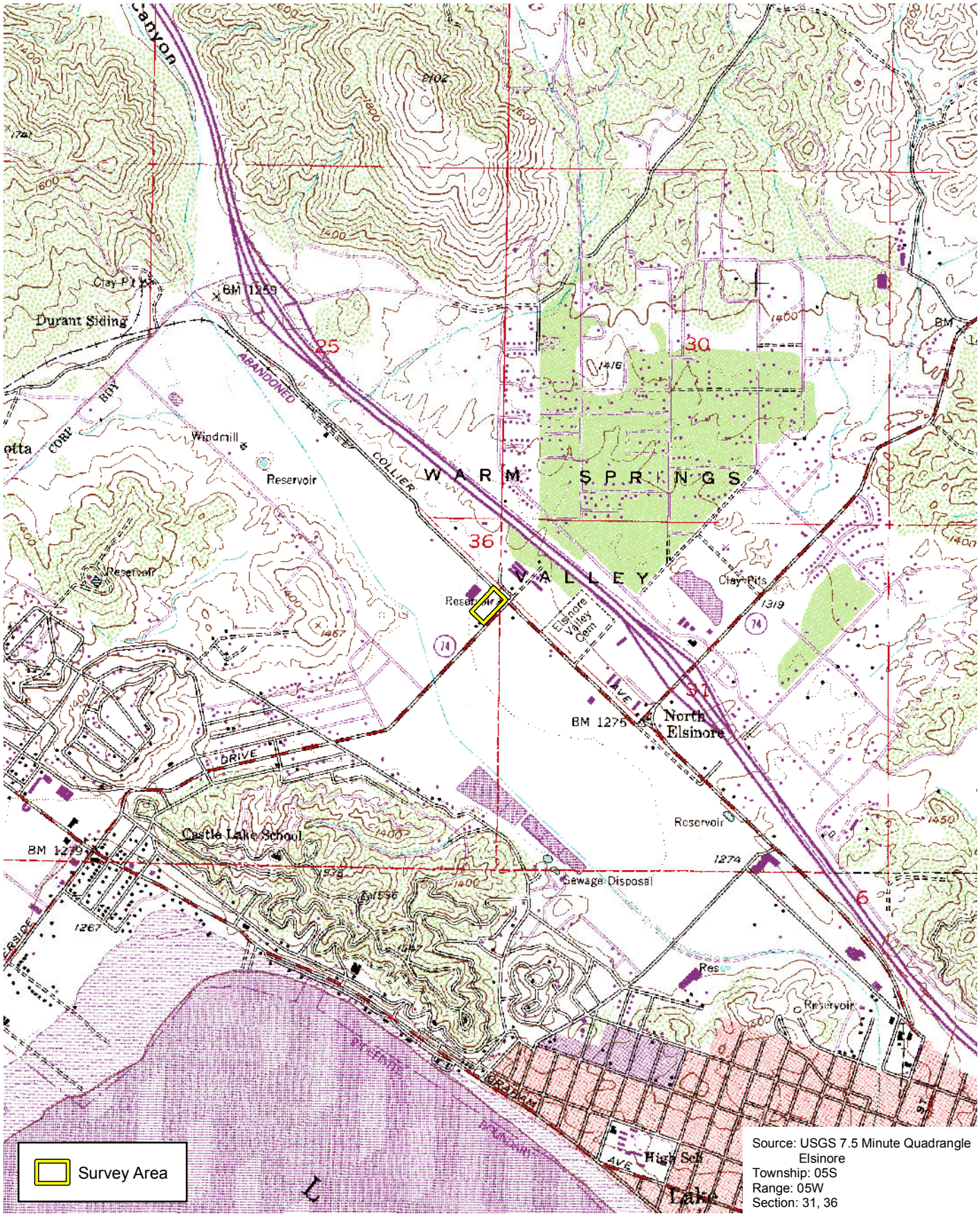

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USGS 7.5-Minute Digital Quadrangle

Exhibit 2

Kassab Travel Center

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Soil Types

Exhibit 3

Kassab Travel Center

N W E S

100 50 0 100

Feet

PSOMAS

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- A portion of Proposed Linkage 7
- A large portion of Proposed Linkage 8

The Planning Species for Subunit 3 (Elsinore) consist of:

- American bittern (*Ixobrychus exilis*)
- Bell's [sage] sparrow (*Artemisiospiza belli*)
- black-crowned night heron (*Nycticorax nycticorax*)
- double-crested cormorant (*Phalacrocorax auritus*)
- least Bell's vireo (*Vireo bellii pusillus*)
- loggerhead shrike (*Lanius ludovicianus*)
- mountain plover (*Charadrius montanus*)
- northern harrier (*Circus cyaneus*)
- osprey (*Pandion haliaetus*)
- southwestern willow flycatcher (*Empidonax traillii extimus*)
- white-faced ibis (*Plegadis chihi*)
- Quino checkerspot butterfly (*Euphydryas editha quino*)
- *Riverside fairy shrimp (Streptocephalus woottoni*)
- Bobcat (*Lynx rufus*)
- western pond turtle (*Emys marmorata*)
- Munz's onion (*Allium munzii*)
- San Diego ambrosia (*Ambrosia pumila*)
- smooth tarplant (*Centromadia pungens* ssp. *laevis*)

The Biological Issues and Considerations for Subunit 3 (Elsinore) consist of:

- Conserve wetlands including Temescal Wash, Collier Marsh, Alberhill Creek, Lake Elsinore and the floodplain east of Lake Elsinore (including marsh Habitats) and maintain water quality.
- Conserve clay soils supporting Munz's onion.
- Conserve Travers-Willow-Domino soil series.
- Conserve foraging Habitat for raptors, providing a sage scrub-grassland ecotone.
- Conserve grassland Habitat for mountain plover.
- Conserve breeding Habitat for northern harrier.
- Maintain linkage area for bobcat.
- Conserve San Diego ambrosia at Alberhill and Nichols Road or find new populations that would allow for loss of known populations.
- Maintain Core and Linkage Habitat for western pond turtle.
- Maintain Core Area for Riverside fairy shrimp.
- Maintain opportunities for Core and Linkage Habitat for Quino checkerspot butterfly.

The survey area overlaps the eastern edge of Criteria Cell 4266 (Exhibit 4). Cell 4266 contributes to the assembly of Proposed Linkage 2. Proposed Linkage 2 is comprised of wetland habitat associated with Collier Marsh in the City of Lake Elsinore. It supports key populations of the following species: San Diego ambrosia (*Ambrosia pumila*), least Bell's vireo, yellow warbler (*Setophaga petechia*), yellow-breasted chat (*Icteria virens*), downy woodpecker (*Picoides pubescens*), and southwestern willow flycatcher (Dudek 2003). Maintenance of wetland functions and values and water quality of Collier Marsh is important for these species. Areas not affected by edge within this Linkage total approximately 70 acres of the total 160 acres occupied by this Linkage. Since this Linkage may be affected by edge, treatment and management of edge conditions will be necessary to ensure that land uses adjacent to the Linkage do not degrade water quality or inhibit floodplain processes.

Conservation within Cell 4266 will focus on meadow, marsh, riparian scrub, woodland, and forest habitat along Alberhill Creek and adjacent grassland habitat. Conserved areas will connect to meadow, marsh, and grassland proposed for conservation in Cell 4169 to the north. Conservation in the cell ranges from 30 to 40 percent of the cell, focusing on the western portion of the cell. Areas designated as Public/Quasi-Public Lands are located approximately 0.5 mile to the southwest of the survey area.

METHODS

Vegetation Mapping and General Surveys

A literature review was conducted prior to the field survey to identify special status plant and wildlife species known to occur in the project vicinity. The California Native Plant Society's (CNPS') Inventory of Rare and Endangered Plants (CNPS 2017) and the CDFW's California Natural Diversity Database (CNDDB) (CDFW 2017a) were reviewed and included the USGS Alberhill and Lake Elsinore 7.5-minute quadrangles. The RCIP Conservation Summary Report Generator was run to determine MSHCP requirements using APNs 378-030-007, 378-030-009, 378-030-029, and 378-030-031. In addition, the U.S. Department of Agriculture, Natural Resources Conservation Service's (USDA NRCS') Web Soil Survey for the Western Riverside Area was reviewed to determine whether suitable soils are present to support special status plant and wildlife species.

The habitat assessment was conducted on June 14, 2017, by Psomas Senior Biologist Allison Rudalevige. The weather was sunny with a temperature of 85 degrees Fahrenheit and winds of 1–3 miles per hour. The habitat assessment was conducted by walking the survey area and recording plant and wildlife species observed. Vegetation was mapped in the field on an aerial photograph at a scale of 1 inch equals 100 feet (1″=100′). Vegetation types were mapped and generally follow categories outlined in the Western Riverside County MSHCP Habitat Accounts (Dudek 2003). Photographs were also taken during the habitat assessment (see Attachment E-6).

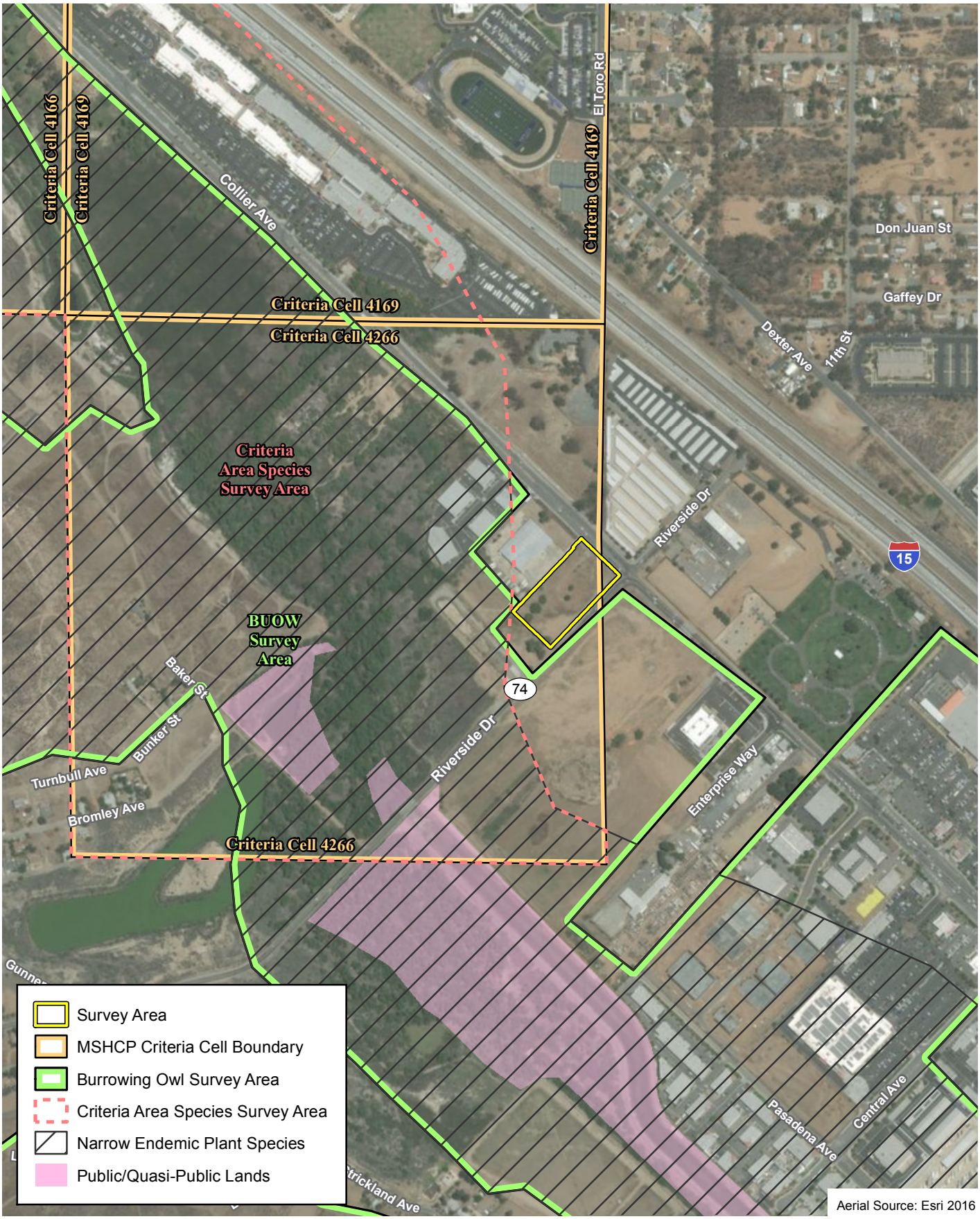
All plant and wildlife species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified using taxonomic keys in Baldwin et al. (2012), Hickman (1993), and Munz (1974). Nomenclature of plant taxa conform to the CDFW's *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2017c) for special status species and Jepson eFlora (Jepson Flora Project 2015) for all other taxa.

All wildlife species detected during the course of the surveys were documented in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by using visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic sign, including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife conform to the CDFW's *Special Animals List* (CDFW 2017b) for special status species; nomenclature for non-special status wildlife generally follows Collins and Taggart (2009) for amphibians and reptiles, American Ornithologists' Union (2015) for birds, and Smithsonian National Museum of Natural History (2011) for mammals.

EXISTING CONDITIONS

Vegetation Types and Other Areas

The following vegetation type and other landcovers occur in the survey area: ruderal, bare ground, and developed (Exhibit 5; Table 1).



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Western Riverside County Multiple Species Habitat Conservation Plan

Exhibit 4

Kassab Travel Center

N W E S

650 325 0 650

Feet

PSOMAS

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Biological Resources

Exhibit 5

Kassab Travel Center

N
W E
S

100 50 0 100

Feet

PSOMAS

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TABLE 1
VEGETATION TYPES AND OTHER LANDCOVER IN THE SURVEY AREA

Vegetation Type or Other Landcover	Amount in the Survey Area (acres)
ruderal	2.34
bare ground	0.43
developed	0.07
Total	**2.84**

Ruderal (weedy) vegetation occurs throughout much of the survey area. The dominant species are grayish shortpod mustard (*Hirschfeldia incana*) and London rocket (*Sisymbrium irio*). Other common herbaceous species include fiddleneck (*Amsinckia* sp.), Russian thistle (*Salsola tragus*), and annual bur-sage (*Ambrosia acanthicarpa*). Evidence of ground-disturbance (e.g., mowing, tilling) during a prior season was noted during the survey; vegetation had not been disturbed this season. Ornamental China berry (*Melia azedarach*) trees occur in the center of the survey area along with a few small Mexican palo verde (*Parkinsonia aculeata*). Ruderal vegetation follows the non-native grassland subassociation of the Grasslands vegetation association of the MSHCP habitat accounts (Dudek 2003).

Unvegetated areas consist of bare ground and developed. The portion of the survey area adjacent to Riverside Drive is bare, while a paved sidewalk is adjacent to Collier Avenue. These areas correspond to the Residential/Urban/Exotic vegetation association of the MSHCP habitat accounts (Dudek 2003).

Wildlife

The survey area provides low quality habitat for wildlife species due to the lack of native plant communities, the disturbed (i.e., tilled) nature of the survey area, and surrounding urban development. Wildlife species present are expected to be relatively urban tolerant and acclimated to human activity.

No waterbodies or water courses were observed in the survey area; therefore, fish and amphibian species are not expected to occur.

No reptile species were observed during the survey; common species that may occur in the survey area include the western fence lizard (*Sceloporus occidentalis*), western side-blotched lizard (*Uta stansburiana elegans*), and gopher snake (*Pituophis catenifer*).

Say's phoebe (*Sayornis saya*) was the only bird species observed during the survey. Other common bird species that may occur include mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), house finch (*Haemorhous mexicanus*), and lesser goldfinch (*Spinus psaltria*). Common raptor species such as red-tailed hawk (*Buteo jamaicensis*) may forage in the survey area.

The only mammal species observed during the survey was California ground squirrel (*Otospermophilus beecheyi*). Other common mammal species that may occur in the survey area include Botta's pocket gopher (*Thomomys bottae*), Virginia opossum (*Didelphis virginiana*), common raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Bat species that forage

and roost in urban areas, such as the big brown bat (*Eptesicus fuscus*), may occur in the survey area.

Wildlife Movement

The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic information. Corridors mitigate the effects of this fragmentation by (1) allowing animals to move between remaining habitats, thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events, such as fire or disease, will result in population or local species extinction; and (3) serving as travel routes for individual animals as they move in their home ranges in search of food, water, mates, and other necessary resources.

The survey area is located in an urban setting with open space, including riparian vegetation, located to the south and west. The survey area lacks native vegetation cover and is on the edge of a developed area. Wildlife species occurring in the survey area are expected to be relatively urban tolerant and acclimated to human activity given the surrounding development. The site is not fenced; therefore, wildlife may move into the survey area. Riverside Drive, Collier Avenue, and an existing building limit movement from the southeast, northeast, and northwest, respectively; therefore, the site itself would not function as a movement corridor between larger areas of open space.

Proposed Linkage 2 occurs approximately 600 feet west of the survey area. The proposed project would not directly impact this linkage. Indirect impacts on wildlife movement (e.g., edge effects) from construction noise, human activity, and ongoing use of the site is expected to be limited due to the proposed project site's distance (600 feet) from this linkage.

SPECIAL STATUS RESOURCES

Special status resources include plant and wildlife species and vegetation types. These species have generally been afforded this recognition by federal and State resource agencies and by private conservation organizations (e.g., the CNPS). In general, the principal reason an individual taxon (e.g., species, subspecies, or variety) is given such recognition is a documented or perceived decline or limitation of its population size, geographic range, and/or distribution that results, in most cases, from habitat loss.

The Riverside County Board of Supervisors approved the MSHCP in 2003 and received permitting approval from the U.S. Fish and Wildlife Service (USFWS) in June 2004. This plan establishes Criteria Areas (i.e., reserves) to adequately conserve many species listed as Threatened and Endangered by the USFWS and the CDFW. Impacts on Covered Species would be considered fully mitigated with the City's participation in the MSHCP program. With the exception of a few species (e.g., least Bell's vireo, which is a Riparian/Riverine species), focused surveys are not required for Covered Species and no additional permitting would be necessary.

Riparian/Riverine Resources

As defined by Section 6.1.2 of the MSHCP, Riparian/Riverine areas are lands that contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur

close to or depend upon soil moisture from a nearby fresh water source or areas with fresh water flow during all or a portion of the year (Dudek 2003).

No rivers, streams, or other watercourses (or vegetation associated with these features) were observed in the survey area. The closest riparian vegetation is located in a flood-control channel less than 200 feet southwest of the survey area; denser, more mature riparian habitat associated with Collier Marsh (and included as part of Proposed Linkage 2) occurs in Alberhill Creek, approximately 600 feet west of the survey area. The proposed project would not directly impact this linkage, wetland habitat associated with Collier Marsh, or habitat of key plant and wildlife populations associated with this proposed linkage (i.e., San Diego ambrosia, least Bell's vireo, yellow warbler, yellow-breasted chat, downy woodpecker, and southwestern willow flycatcher). Since the proposed project would not directly impact Riparian/Riverine areas, a Determination of Biologically Equivalent or Superior Preservation (DBESP) is not required.

While the proposed project would not directly impact riparian bird species (least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo) by removing their habitat, construction noise and human activity may indirectly impact riparian bird species if they occur in the flood-control channel's adjacent riparian habitat, approximately 200 feet southwest of the proposed project site. These activities are not expected to impact species in Alberhill Creek, since it is more than 500 feet from proposed project activities. Indirect impacts on riparian bird species could be avoided or minimized if construction activities, or at least the most noise-intensive portions of construction, can be limited to the season when these migratory birds are not present in California (i.e., September 16 to March 14). While indirect impacts should be avoided, if possible, there is no requirement to limit construction timing adjacent to riparian habitat.

Construction-related minimization measures provided in Section 7.5.3 of the MSHCP (see Appendix A) would minimize indirect impacts to adjacent riparian or riverine resources by requiring Best Management Practices (BMPs) to protect water quality.

Guidelines in Section 6.1.4 of the MSHCP (see Appendix B) would be required to ensure that adjacent riparian/riverine habitats are not indirectly impacted by long-term changes in water quality, increased noise, or increased night lighting. A further discussion of these indirect impacts is provided below.

"Waters of the U.S."/"Waters of the State"

Section 404 of the Federal Clean Water Act (CWA) and Section 1602 of the *California Fish and Game Code* regulate activities affecting resources under the jurisdiction of the USACE and the CDFW, respectively. "Waters of the U.S.", under the jurisdiction of the USACE include navigable coastal and inland waters, lakes, rivers, streams, and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce. The CDFW has jurisdictional authority over resources associated with rivers, streams, and lakes. Section 401 of the CWA provides the Regional Water Quality Control Board (RWQCB) with the authority to regulate, through a Water Quality Certification, any proposed federally permitted activity that may affect water quality. The RWQCB also has jurisdiction over isolated wetlands and waters under the Porter-Cologne Water Quality Control Act.

No drainages, waterbodies, or other water resources under the regulatory authority of the USACE, the CDFW, or the RWQCB were observed in the survey area. Therefore, there would be no impacts on jurisdictional resources and no permits, agreements, or certifications would be required from these agencies.

Vernal Pools

As defined by Section 6.1.2 the MSHCP, vernal pools are seasonal wetlands that occur in sunken areas that have wetland soils, vegetation, and hydrology during the wetter portion of the growing season, but lack hydrology and/or vegetation during the drier portion of the year (Dudek 2003).

No basins, ponds, or obvious depressional features were observed during the survey. However, a small area exhibiting surface soil cracks was present in the southwest portion of the survey area. Surface soil cracks, where clay sediment is deposited by infiltration and evaporation of water, are an indicator of hydrology and possible ponding. If the area holds surface water, it may provide habitat for vernal pool branchiopods (i.e., fairy shrimp). One fairy shrimp, Riverside fairy shrimp (*Streptocephalus woottonii*), was reported from the literature review in the project vicinity (CDFW 2017a).

Given that the survey was conducted during the dry season, it was not possible to directly determine whether this area holds water for any length of time. However, it is unlikely that the area ponds. A review of aerial Google Earth[1] imagery shows no indication of surface water or soil saturation over multiple years and seasons. In addition, the soil type mapped in the survey area is not considered hydric (USDA NRCS 2017). This area would not be considered a "vernal pool" because indicator plant species (e.g., woolly-marbles [*Psilocarphus brevissimus*], toad rush [*Juncus bufonius*], or water crassula [*Crassula aquatica*]) are not likely to be present; plant species observed in the immediate area consist of horseweed (*Erigeron canadensis*), stinknet (*Oncosiphon piluliferum*), annual bur-sage, and grayish shortpod mustard, which are considered upland or facultative upland species. For these reasons, fairy shrimp are not expected to occur in the survey area.[2]

Criteria Area, Narrow Endemic, and Other Special Status Plant Species

According to the RCIP Summary Report Generator, focused plant surveys are not required for Criteria Area or Narrow Endemic plant species.[3] Based on the literature review, nine species not covered by the MSHCP (as shown in Section 6.1.3) have been reported in the vicinity of the survey area: chaparral sand-verbena (*Abronia villosa* var. *aurita*), sticky dudleya (*Dudleya viscida*), Tecate cypress (*Hesperocyparis forbesii*), mesa horkelia (*Horkelia cuneata* var. *puberula*), Robinson's peppergrass (*Lepidium virginicum* var. *robinsonii*), intermediate monardella (*Monardella hypoleuca* ssp. *intermedia*), white rabbit-tobacco (*Pseudognaphalium leucocephalum*), San Bernardino aster (*Symphyotrichum defoliatum*), and California screw moss (*Tortula californica*). Given the ruderal nature of the survey area and apparent periodic ground disturbance, these species are not expected to occur in the survey area. Therefore, there would be no impact on these species, and no mitigation would be required.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*), a species with a California Rare Plant Rank of 1B.1, has potential to occur in the survey area because suitable habitat and soils for the species are present. In addition, it was reported to occur in a disturbed lot less than 1,000 feet away. Smooth tarplant is a Criteria Area species covered by the MSHCP. Because the survey area is located outside an "Additional Survey Needs Area" for smooth tarplant (Exhibit 4), any impacts on the species, if present, would be considered mitigated with the City's participation in the MSHCP.

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1 Images were reviewed from May 1994; May 2002; January, September, and October 2004; December 2005; January and June 2006; June and November 2009; March 2011; June 2012; January, March, and November 2013; April and September 2014; and February and October 2016.

2 It should be noted that the surveying Biologist holds a 10(a) permit to survey for fairy shrimp.

3 The Criteria Area and Narrow Endemic plant survey boundary overlaps a portion of APNs 378-030-029 and 378-030-031; however, the survey area does not extend into this area.

Special Status Wildlife Species

According to the RCIP Summary Report Generator, focused surveys are not required for burrowing owl or other Additional Survey Needs species[4] (Exhibit 4). Impacts to all other special status wildlife species with potential to occur in the survey area that would typically require mitigation in California Environmental Quality Act (CEQA) documentation are covered by the City's participation in the MSHCP.

Stephens' Kangaroo Rat

In response to the federal listing of Stephens' kangaroo rat (*Dipodomys stephensi*), the Riverside County Habitat Conservation Agency (RCHCA) was formed. Its purpose is to acquire and manage habitat for the Stephens' kangaroo rat and other associated special status species. The RCHCA Stephens' Kangaroo Rat Habitat Conservation Plan (HCP) was developed to meet the requirements of the program's Federal Endangered Species Act Section 10(a) permit. The HCP for this species is managed by the RCHCA. The HCP establishes a Reserve System where activities in the core reserve areas are limited and/or restricted. Areas outside the Reserve System are within a designated Fee Area.

The survey area is located within a designated Fee Area. For projects within a Fee Area, focused surveys for the Stephens' kangaroo rat are not required, and all potential impacts are mitigated through the RCHCA.

OTHER ISSUES

Urban/Wildlands Interface Issues

Indirect impacts, often called "edge effects", are those that affect the quality of nearby wildlife habitat resulting from disturbance by construction (such as noise, dust, and urban pollutants) and/or the long-term use of the site. Development in proximity to the MSHCP Conservation Area may result in edge effects that adversely affect biological resources within the MSHCP Conservation Area. The text below each subheading states the objective of each of these measures as described in the MSHCP.

The proposed project partially overlaps MSHCP Criteria Cell 4266 (2.67 acres within the Cell, 0.17 acre outside the Cell). Lands within Cell 4266 would provide for Proposed Linkage 2, which occurs approximately 600 feet west of the proposed project site. Although the proposed project would not directly impact Proposed Linkage 2, it could generate edge effects, as discussed below. However, in general edge effects on wildlife movement from noise and human activity are expected to be limited due to the proposed project site's distance (i.e., 600 feet) from Proposed Linkage 2.

Drainage

Proposed developments in proximity to the MSHCP Conservation Area shall incorporate measures, including measures required through the National Pollutant Discharge Elimination System (NPDES) requirements, to ensure that the quantity and quality of runoff discharged to the MSHCP Conservation Area is not altered in an adverse way when compared with existing conditions. In particular, measures shall be put in place to avoid discharge of untreated surface runoff from developed and paved areas into the MSHCP Conservation Area. Stormwater systems shall be designed to prevent the release of toxins, chemicals, petroleum products, exotic plant

[4] The burrowing owl survey boundary overlaps a portion of APNs 378-030-029 and 378-030-031; however, the survey area does not extend into this area.

materials or other elements that might degrade or harm biological resources or ecosystem processes within the MSHCP Conservation Area. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. Regular maintenance shall occur to ensure effective operations of runoff control systems.

The nearest flood-control channel occurs less than 200 feet southwest of the survey area; Alberhill Creek is approximately 600 feet west of the survey area. Stormwater runoff from construction and operation of the proposed project have the potential to adversely affect water quality in offsite drainages. Measures to protect water quality are included below to minimize adverse effects on water quality.

Toxics

Land uses proposed in proximity to the MSHCP Conservation Area that use chemicals or generate bioproducts such as manure that are potentially toxic or may adversely affect wildlife species, Habitat or water quality shall incorporate measures to ensure that application of such chemicals does not result in discharge to the MSHCP Conservation Area. Measures such as those employed to address drainage issues shall be implemented.

Petroleum products will be present on the proposed project site during construction and operation and could adversely affect the adjacent habitat. Measures are included to minimize the effects runoff of toxics into adjacent habitat areas.

Lighting

Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting. Shielding shall be incorporated in project designs to ensure ambient lighting in the MSHCP Conservation Area is not increased.

Development of the proposed project would include new lighting that may adversely affect wildlife species in adjacent open space. Measures to direct lighting away from adjacent open space are included to minimize these effects.

Noise

Proposed noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations and guidelines related to land use noise standards. For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards.

While the proposed project would create an incremental increase, noise levels are not expected to increase substantially over existing conditions considering the ambient noise from the existing development and roads adjacent to the proposed project site and the distance to Proposed Linkage 2 (600 feet). Therefore, no measures would be required.

Invasives

When approving landscape plans for Development that is proposed adjacent to the MSHCP Conservation Area, Permittees shall consider the invasive, non-native plant species (see MSHCP Table 6-2) and shall require revisions to landscape plans (subject to the limitations of their jurisdiction) to avoid the use of invasive species for the portions of development that are adjacent to the MSHCP Conservation Area. Considerations in reviewing the applicability of this list shall include proximity of planting areas to the MSHCP Conservation Areas, species considered in the

planting plans, resources being protected within the MSHCP Conservation Area and their relative sensitivity to invasion, and barriers to plant and seed dispersal, such as walls, topography and other features.

Ornamental landscaping associated with the proposed project may introduce new invasive species to the surrounding open space. Invasive species have the potential to spread into the surrounding natural open space and displace native species, hybridize with native species (thereby impacting the genetic integrity of the native species), alter biological communities, or alter ecosystem processes. This could degrade the quality of the adjacent vegetation, including vegetation communities that provide suitable habitat for Threatened or Endangered species. Measures are included for the landscaping plan to be reviewed to avoid this potential impact.

Construction equipment can also introduce non-native weed seeds to adjacent areas if equipment is not properly cleaned. While the survey area is already dominated by non-native, weedy species (i.e., grayish shortpod mustard and London rocket), these species are considered to have moderate and limited invasive impacts, respectively, by the California Invasive Plant Council (Cal-IPC).[5] Adjacent habitat could be further degraded by the use of highly invasive species (e.g., artichoke thistle [*Cynara cardunculus*]).Measures are included for vehicle washing BMPs.

Barriers

Proposed land uses adjacent to the MSHCP Conservation Area shall incorporate barriers, where appropriate in individual project designs to minimize unauthorized public access, domestic animal predation, illegal trespass or dumping in the MSHCP Conservation Area. Such barriers may include native landscaping, rocks/boulders, fencing, walls, signage and/or other appropriate mechanisms.

New land development may lead to unauthorized public access, domestic animal predation, and/or illegal trespass or dumping that may negatively affect the MSHCP Conservation Area. While the proposed project would incrementally increase human activity (i.e., a gas station, convenience store, and restaurant), this increase is not expected be a substantial increase over current conditions with existing development adjacent to the proposed project site However, measures are recommended to include landscaping or fencing to discourage public access to adjacent areas.

Grading/Land Development

Manufactured slopes associated with proposed site development shall not extend into the MSHCP Conservation Area.

Grading for the proposed project would be limited to the boundaries of the proposed project site. It would not affect Proposed Linkage 2 along Alberhill Creek. Therefore, no measures would be required.

Nesting Raptors

Trees in the survey area and immediate vicinity have potential to be used for nesting by raptors such as the American kestrel (*Falco sparverius*). Regulations prohibit activities that “take, possess

[5] Species with a high rating have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Species with a moderate rating have substantial and apparent, but generally not severe, ecological impacts. Species with a limited rating are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score (Cal-IPC 2018)

or destroy" any raptor nest or egg (*California Fish and Game Code* §§3503, 3503.5, and 3513). Additionally, the noise and disturbance associated with construction may disturb a nesting raptor if present immediately adjacent to the proposed project impact area. If construction would be initiated during the raptor nesting season (generally between February 1 and June 30), a pre-construction survey would be required to ensure that no raptor nests are impacted. If an active nest is present, construction may be temporarily restricted in the immediate vicinity of the nest until raptor nesting is complete.

Migratory Bird Treaty Act

The survey area has potential to be used by nesting birds, which are protected by the Migratory Bird Treaty Act (MBTA). Birds have potential to nest in any of the survey area's vegetation, bare ground, and also on adjacent structures. The MBTA prohibits activities that result in the direct take (defined as the killing or possession) of a migratory bird. If construction would be initiated during the peak bird nesting season (March 1 to June 30, as defined by Section 7.5.3 of the MSHCP), a pre-construction survey would be required to ensure that no nests are impacted. If an active nest is present, construction may be restricted in the immediate vicinity of the nest.

Construction Minimization Measures

Section 7.5.3 of the MSHCP contains a list of standard measures to minimize direct and indirect impacts on biological resources within and adjacent to project sites. These measures are related to protecting water quality, controlling dust, minimizing the spread of invasive plant species, minimizing fire hazards, and other measures. These measures also include requirements to mark project limits through staking/flagging and for a Biological Monitor to be present during vegetation clearing.

MSHCP CONSISTENCY

The proposed project would not directly impact Proposed Linkage 2, wetland habitat associated with Collier Marsh, or habitat of key plant and wildlife populations associated with this proposed linkage (i.e., San Diego ambrosia, least Bell's vireo, yellow warbler, yellow-breasted chat, downy woodpecker, and southwestern willow flycatcher). Indirect impacts would be avoided/minimized by implementing the Urban/Wildlands Interface Guidelines in Section 6.1.4 of the MSHCP.

The proposed project would not conflict with the conservation goals of Cell 4266. Conservation in the cell ranges from 30 to 40 percent of the cell, focusing on the western portion of the cell. The proposed project will impact 2.67 acres of the Criteria Cell along the its eastern boundary, which represents approximately 1.7 percent of the 158-acre cell (0.17 acre of the survey area is not located within a Criteria Cell). Thus, the proposed project would impact the portion of Cell 4266 outside of the area that is targeted for conservation.

Regarding the Biological Issues and Considerations for Subunit 3 (Elsinore):

- Wetlands including Temescal Wash, Collier Marsh, Alberhill Creek, Lake Elsinore and the floodplain east of Lake Elsinore (including marsh Habitats) would not be impacted by the proposed project. Implementation of the Urban/Wildlands Interface Guidelines in Section 6.1.4 of the MSHCP will maintain water quality of nearby wetlands (Collier Marsh and Alberhill Creek).
- Clay soils supporting Munz's onion are not present in the survey area.
- Travers-Willow-Domino soil series are not present in the survey area.

- Potential foraging habitat for raptors would be impacted, but the proposed project would not impact sage scrub-grassland ecotone habitat. The loss of 2.84 acres of raptor foraging habitat is not expected to substantially decrease the amount of raptor foraging habitat in the region.
- Habitat for mountain plover in the survey area is considered marginally suitable and there are no recent occurrences known from the vicinity (most are east of Perris).
- Northern harrier is not expected to breed in the survey area.
- Given the surrounding urban development, the survey area does not provide a linkage area for bobcat, although bobcat is expected to use Proposed Linkage 2 located 600 feet west of the survey area.
- The survey area is not in an area requiring focused surveys for San Diego ambrosia per Section 6.1.3 of the MSHCP. The population at Alberhill and Nichols Road would not be impacted by the proposed project.
- Core and Linkage habitat for western pond turtle is not present in the survey area.
- A Core Area for Riverside fairy shrimp is not present in the survey area.
- Core and Linkage habitat for Quino checkerspot butterfly is not present in the survey area.

RECOMMENDATIONS

The following is a list of recommendations to ensure that the proposed project is consistent with the MSHCP and other regulations protecting biological resources.

1. Drainage: A. A Storm Water Pollution Prevention Plan will be prepared and followed.

   B. Measures in the Project Specific Water Quality Management Plan (Rahman 2017) will be followed.

   - Drainage flows will be captured by the proposed ribbon gutters toward the proposed BMPs. Permeable pavements are incorporated into the Project design. These surfaces reduce the volume and peak of stormwater runoff and mitigate pollutants from stormwater runoff.
   - Washwater containing any cleaning agent or degreaser and discharge will be collected to the sanitary sewer and not to a storm drain.
   - Storm drain inlets will be marked “only rain down the storm drain”. Stormwater pollution prevention information will be provided to new site owners, lessees, or operators. A Lease agreement will include the following: “tenant shall not allow anyone to discharge anything to storm drains or store or deposit materials so as to create a potential discharge to storm drains”.

2. Toxics: Guidelines in Lake Elsinore Municipal Code Section 17.112.090 pertaining to gasoline dispensing establishments will be followed. This includes a minimum 30-foot setback of gasoline pumps and pump islands from any property line.

3. Lighting: Lighting features will be incorporated in the project design that comply with Lake Elsinore Municipal Code Section 17.112.040 Lighting (for Nonresidential Development). This includes orienting and shielding all outdoor lighting fixtures in excess of 60 watts to prevent glare or direct illumination on adjacent properties.

4. Invasives:

    A. The Landscaping Plan will be reviewed by a qualified Biologist to ensure that invasive species are not included in the plant palette. If possible, the Landscape Plan should use low water-using plants to be consistent with Assembly Bill 1881.

    B. Weed seeds entering the construction area via vehicles will be minimized by requiring construction vehicles to be washed prior to delivery to the project site. Track-clean or other methods of vehicle cleaning will be used by the construction contractor to prevent weed seeds from entering/exiting the project site on vehicles.

    C. Wattles used for erosion control will be certified as weed-free.

5. Barriers: Landscaping and/or fencing should be used to discourage public access and illegal dumping in adjacent habitat areas.

6. Vegetation removal should be planned to occur outside the peak nesting season for raptors (February 1 to June 30) and the peak nesting season for birds (March 1 to June 30). If vegetation removal would occur between February 1 and June 30, a pre-construction survey for active raptor/bird nests would be required. Restrictions may be placed on construction activities in the vicinity of any active nest until the nest is no longer active, as determined by a qualified Biologist.

7. Construction Minimization Measures in Section 7.5.3 of the MSHCP should be followed during construction (see Appendix A).

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APPENDIX A

CONSTRUCTION MINIMIZATION MEASURES

- Plans for water pollution and erosion control will be prepared for all Discretionary Projects involving the movement of earth in excess of 50 cubic yards. The plans will describe sediment and hazardous materials control, dewatering or diversion structures, fueling and equipment management practices, use of plant material for erosion control. Plans will be reviewed and approved by the County of Riverside and participating jurisdiction prior to construction.
- Timing of construction activities will consider seasonal requirements for breeding birds and migratory non-resident species. Habitat clearing will be avoided during species active breeding season defined as March 1 to June 30.
- Sediment and erosion control measures will be implemented until such time soils are determined to be successfully stabilized.
- Short-term stream diversions will be accomplished by use of sand bags or other methods that will result in minimal in-stream impacts. Short-term diversions will consider effects on wildlife.
- Silt fencing or other sediment trapping materials will be installed at the downstream end of construction activities to minimize the transport of sediments off-site.
- Settling ponds where sediment is collected will be cleaned in a manner that prevents sediment from re-entering the stream or damaging/disturbing adjacent areas. Sediment from settling ponds will be removed to a location where sediment cannot re-enter the stream or surrounding drainage area. Care will be exercised during removal of silt fencing to minimize release of debris or sediment into streams.
- No erodible materials will be deposited into water courses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks.
- The footprint of disturbance will be minimized to the maximum extent feasible. Access to sites will occur on pre-existing access routes to the greatest extent possible.
- Equipment storage, fueling and staging areas will be sited on non-sensitive upland habitat types with minimal risk of direct discharge into riparian areas or other sensitive habitat types.
- The limits of disturbance, including the upstream, downstream and lateral extents, will be clearly defined and marked in the field. Monitoring personnel will review the limits of disturbance prior to initiation of construction activities.
- During construction, the placement of equipment within the stream or on adjacent banks or adjacent upland habitats occupied by Covered Species that are outside of the project footprint will be avoided.
- Exotic species removed during construction will be properly handled to prevent sprouting or regrowth.
- Training of construction personnel will be provided.
- Ongoing monitoring and reporting will occur for the duration of the construction activity to ensure implementation of best management practices.
- When work is conducted during the fire season (as identified by the Riverside County Fire Department) adjacent to coastal sage scrub or chaparral vegetation, appropriate fire-fighting equipment (e.g., extinguishers, shovels, water tankers) shall be available on the site during all phases of project construction to help minimize the chance of human-caused wildfires. Shields, protective mats, and/or other fire preventative methods shall be used during grinding, welding, and other spark-inducing activities. Personnel trained in fire

hazards, preventative actions, and responses to fires shall advise contractors regarding fire risk from all construction-related activities.

- Active construction areas shall be watered regularly to control dust and minimize impacts to adjacent vegetation.
- All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances shall occur only in designated areas within the proposed grading limits of the project site. These designated areas shall be clearly marked and located in such a manner as to contain run-off.
- Waste, dirt, rubble, or trash shall not be deposited in the Conservation Area or on native habitat.

Appendix C

Cultural Resources Assessment for Kassab Travel Center Project

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

CULTURAL RESOURCES ASSESSMENT REPORT FOR THE KASSAB TRAVEL CENTER PROJECT, CITY OF LAKE ELSINORE, CALIFORNIA

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February 2018

Cogstone Project Number: 4083
Type of Study: Cultural Resources Assessment
Archaeological Sites: None
USGS Quadrangle: Elsinore 7.5'
Area: 2.39 acres
Key Words: Negative Survey, Luiseño, Lake Elsinore

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SUMMARY OF FINDINGS

The Kassab Travel Center proposes to construct a 6,000 square foot convenience store with three quick serve restaurants, two covered gas dispensing areas totaling 5,264 square feet, and a free standing 2,543 square foot fast food restaurant with a drive-through within Accessor's Parcel Number (APNs) 378-030-007 and 378-030-009 in the City of Lake Elsinore. The Project Area (PA) is located at the southwest corner of Riverside Drive and Collier Street in the City of Perris.

A search for archaeological and historical records was completed at the Eastern Information Center (EIC). The records search determined that there are no previously recorded cultural resources located within the PA boundaries. A total of fifteen cultural resources have been previously documented outside of the PA but within the one-mile search radius. These consist of one prehistoric archaeological site, three prehistoric archaeological isolates, six historic archaeological sites, two historic archaeological isolates and three historic built environment resources.

The City of Lake Elsinore is conducting Native American Consultations to meet their requirements under Assembly Bill 52 (AB52). Cogstone, on behalf of the City, drafted and sent the letters to the tribes on December 20, 2017. Three responses were received within the 30 day time period. As of February 20, 2018, the City of Lake Elsinore is still in consultation with the tribes.

Cogstone conducted an intensive pedestrian survey of the 2.39 acre PA. The survey was negative for cultural resources. Ground visibility was limited (30 percent) due to tall, dense, invasive weeds throughout the PA. In addition, concrete chunks and decomposed asphalt were scattered throughout the PA.

The maximum depth of excavation will be six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep. The shallow depth of excavation and the lack of archaeological sites in the project vicinity and the disturbance of the PA due to previous development (reservoir) indicate that the potential for discovery of intact archaeological deposits, including unknown buried archaeological deposits, materials, or features, by the implementation of this Project is low. No further cultural resources work is necessary.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist can evaluate it. If human remains are unearthed during excavation, State Health and Safety Code Section 7050.5 states "there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered... [has made the appropriate assessment, and] …recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code."

INTRODUCTION

PURPOSE OF STUDY

The purpose of this study is to determine the potential effects to cultural resources resulting from the construction of the Kassab Travel Center Project (Project; Figure 1). This technical study provides environmental documentation as required by the California Environmental Quality Act (CEQA). The City of Lake Elsinore is the lead agency.

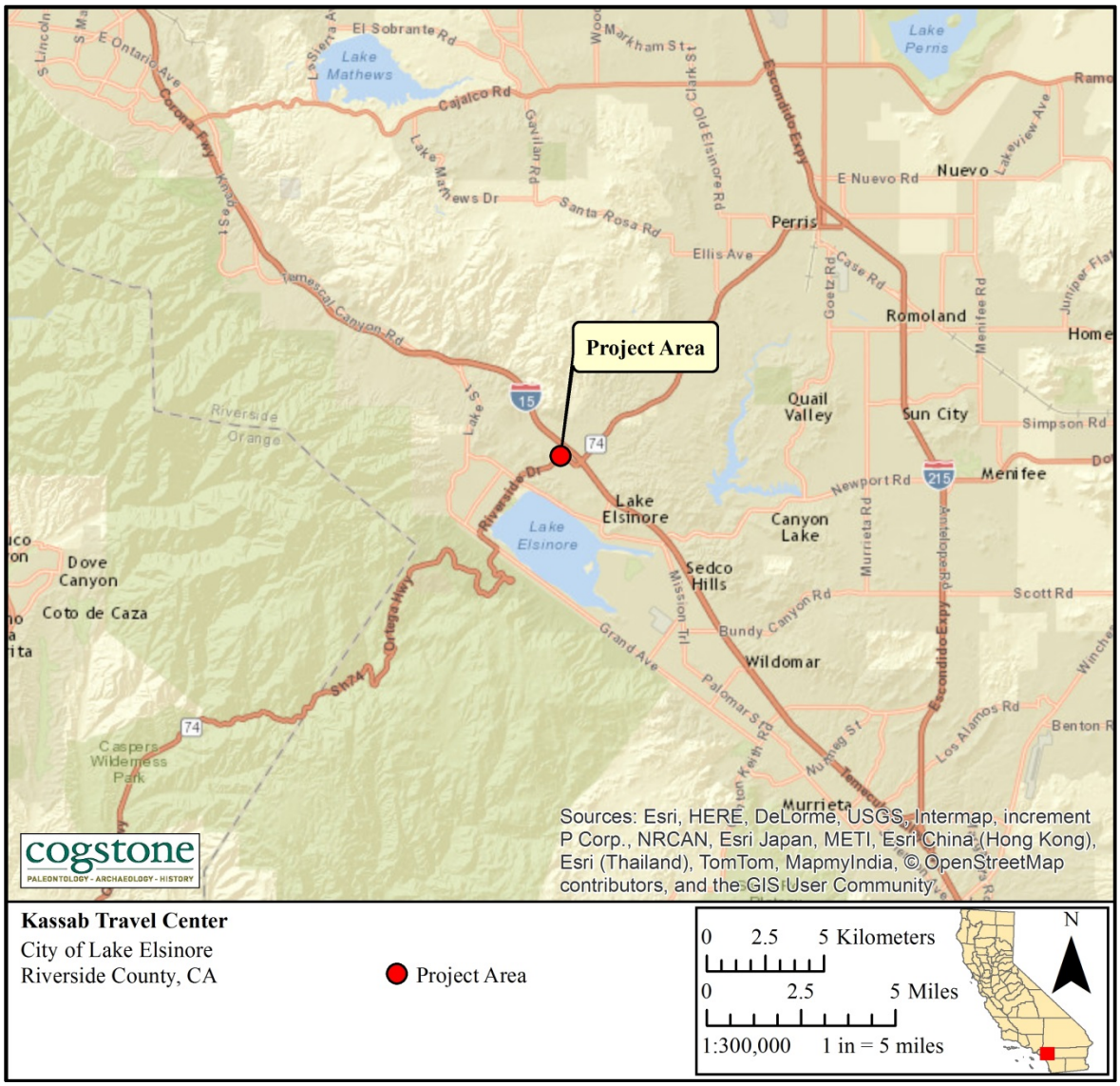

Figure 1. Project Vicinity

PROJECT LOCATION AND DESCRIPTION

The Project is located at the southwest corner of Riverside Drive and Collier Street within Accessor's Parcel Numbers (APNs) 378-030-007 and 378-030-009 in the City of Lake Elsinore. The Project is approximately 2.39 acres in size. Specifically, the Project is located within Section 31, Township 5 south, Range 4 west and Section 36, Township 5 south, Range 5 west of the Unites States Geographic Survey (USGS) Lake Elsinore 7.5-minute topographic map.

The proposed Kassab Travel Center will consist of a 6,000 square foot convenience store with three quick serve restaurants, two covered gas dispensing areas totaling 5,264 square feet, and a free standing 2,543 square foot fast food restaurant with a drive-through. The maximum depth of excavation will be six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

PROJECT PERSONNEL

Cogstone Resource Management Inc. (Cogstone) conducted the cultural resources study for this assessment. Holly Duke served as the task manager for the Project, supervising all work and prepared the majority of the report. Duke has a B.A. in Archaeology/History from Simon Fraser University, Canada, and has over five years of experience in southern California archaeology.

Molly Valasik served as the Principal Archaeologist for the Project and edited this report. Ms. Valasik has a M.A. in Anthropology from Kent State University in Ohio and eight years of experience in Southern California archaeology.

Megan Wilson prepared the maps and conducted the records search and survey. Wilson has a M.A. in Anthropology from California State University, Fullerton and has over five years of experience in southern California archaeology. Sherri Gust wrote the regulatory environment, ethnography and prehistory sections. She has an M.S. in Anatomy and a B.S. in Anthropology and more than 30 years of experience. Qualifications of Cogstone personnel are provided in Appendix A.

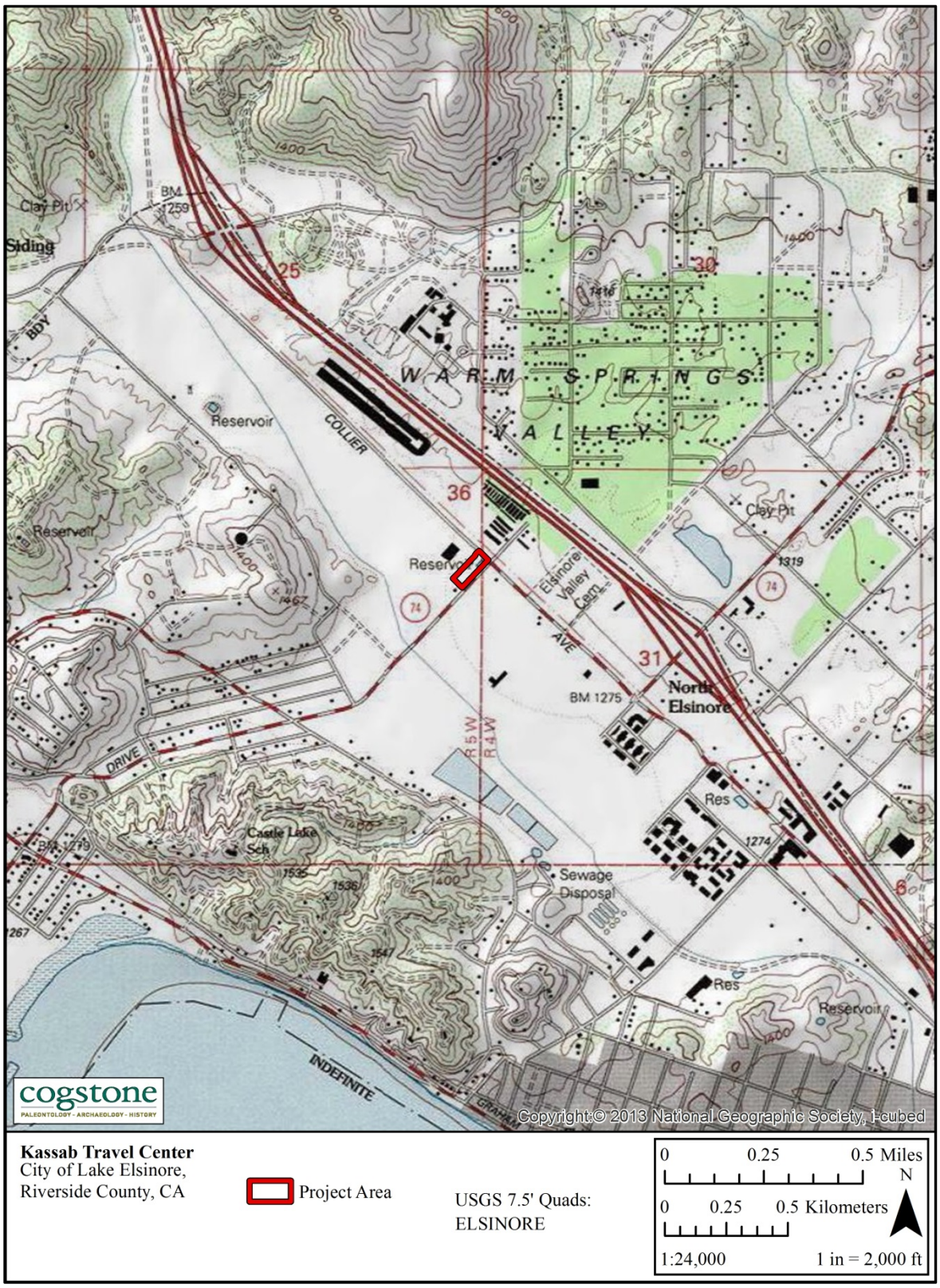

Figure 2. Project Location

REGULATORY SETTING

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA states that: It is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed project and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered.

TRIBAL CULTURAL RESOURCES

As of 2015, CEQA established that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (Pub. Resources Code, § 21084.2). In order to be considered a "tribal cultural resource," a resource must be either:

(1) listed, or determined to be eligible for listing, on the national, state, or local register of historic resources, or

(2) a resource that the lead agency chooses, in its discretion, to treat as a tribal cultural resource.

To help determine whether a project may have such an effect, the lead agency must consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project. If a lead agency determines that a project may cause a substantial adverse change to tribal cultural resources, the lead agency must consider measures to mitigate that impact. Public Resources Code §20184.3 (b)(2) provides examples of mitigation measures that lead agencies may consider to avoid or minimize impacts to tribal cultural resources.

PUBLIC RESOURCES CODE

Section 5097.5: No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands (lands under state, county, city, district or public authority jurisdiction, or the jurisdiction of a public corporation), except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (CRHR) is a listing of all properties considered to be significant historical resources in the state. The California Register includes all properties listed or determined eligible for listing on the National Register, including properties evaluated under Section 106, and State Historical Landmarks number No. 770 and above. The California Register statute specifically provides that historical resources listed, determined eligible for listing on the California Register by the State Historical Resources Commission, or resources that meet the California Register criteria are resources which must be given consideration under CEQA (see above). Other resources, such as resources listed on local registers of historic registers or in local surveys, may be listed if they are determined by the State Historic Resources Commission to be significant in accordance with criteria and procedures to be adopted by the Commission and are nominated; their listing in the California Register, is not automatic.

Resources eligible for listing include buildings, sites, structures, objects, or historic districts that retain historical integrity and are historically significant at the local, state or national level under one or more of the following four criteria:

1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2) It is associated with the lives of persons important to local, California, or national history;
3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a

historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance.

Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

NATIVE AMERICAN HUMAN REMAINS

Sites that may contain human remains important to Native Americans must be identified and treated in a sensitive manner, consistent with state law (i.e., Health and Safety Code §7050.5 and Public Resources Code §5097.98), as reviewed below:

> In the event that human remains are encountered during project development and in accordance with the Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that "No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value."

CITY OF LAKE ELSINORE

The Project must also comply with the Resource Protection and Preservation Chapter of the Lake Elsinore General Plan approved on December 13, 2011 (Lake Elsinore 2011). The goals and policies for cultural resources are outlined in Goal 6 and Goal 7.

> Policy 6.1: Encourage the preservation of significant archaeological, historical, and other cultural resources located within the City.

Policy 6.2: The City shall consult with the appropriate Native American tribes for projects identified under SB 18 (traditional Tribal Cultural Places).

Policy 6.3: When significant cultural/archaeological sites or artifacts are discovered on a site, coordination with professional archaeologists, relevant state and, if applicable, federal agencies, and the appropriate Native American tribes regarding preservation of sites or professional retrieval and preservation of artifacts or by other means of protection, prior to development of the site shall be required. Because ceremonial items and items of cultural patrimony reflect traditional religious beliefs and practices, developers shall waive any and all claims to ownership and agree to return all Native American ceremonial items and items of cultural patrimony that may be found on a project site to the appropriate tribe for treatment. It is understood by all parties that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act.

Policy 6.4: If archaeological excavations are recommended on a project site, the City shall require that all such investigations include Native American consultation, which shall occur prior to project approval.

Policy 7.1: Consult with California Native American tribes prior to decision-making processes for the purpose of preserving cultural places located on land within the City's jurisdiction that may be affected by the proposed plan, in accordance with State or Federal requirements.

Policy 7.2: Continue to identify, document, evaluate, designate, and preserve the cultural resources in the City.

Policy 7.3: Continue to update a citywide inventory of cultural resources in conformance with state standards and procedures while maintaining the confidentiality of information as required by law.

Policy 7.4: Support the permanent curation of archaeological artifact collections by universities or museums or appropriate tribal facilities.

Policy 7.5: Increase opportunities for cultural heritage tourism by promoting the history of Lake Elsinore to attract cultural heritage travelers while maintaining the confidentiality of Native American sites, places, and other information as required by law.

BACKGROUND

ENVIRONMENTAL SETTING

Today's Mediterranean-like climate is characterized by warm, dry summers and cool, moist winters, with rainfall predominantly falling between November and May. Climatic conditions in this region varied substantially during prehistoric times. Because of the unpredictability of long-range weather patterns and events such as El Niño and other broader weather changes, paleoclimatology becomes a crucial issue in understanding prehistoric adaptations in California, leading to research efforts with the goal of reconstructing past environments (Moratto et al. 1978).

Results of such research have identified several climatic trends since the end of the Pleistocene, a period generally accepted today as being much cooler and wetter than currently experienced. These trends can be generally described as sequential periods of cool/moist and hot/dry conditions. At least six periods of cool/moist conditions separated by five episodes of warm/dry conditions have been recorded during the Holocene (Breschini and Haversat 1998).

Research on a finer scale is being conducted to identify mid-term climatic events such as El Niño, along with debate over the significance of these episodes on the prehistoric cultures of the California Bight (Arnold 1992; Raab and Larsen 1997). Changing climatic conditions appear to have dramatically altered resource exploitation patterns, technology and socio-political systems within prehistoric California populations and it is reasonable to assume that such climatic influences affected the prehistoric inhabitants of the study area.

Current land use in the Project vicinity is mainly commercial in character and much of the land surrounding the PA is developed. Lake Elsinore is the largest natural freshwater lake in Southern California and is part of the San Jacinto Basin. Historically the region was used for ranching, agriculture, and mining. The Project vicinity is characterized by natural vegetation communities representative of the Coastal Sage-Scrub Plant Community and includes chaparral, although the PA is currently covered by invasive weeds like Jimson weed and milkweeds. The California sagebrush series, California buckwheat series and bush seepweed series are common shrubs in this region. California annual grasslands, foothill needlegrass series and saltgrass series comprise much of the vegetation in the area, which also includes saltbush, scrub oak, and chaparral.

PREHISTORIC SETTING

The latest cultural revisions for the Project Area (PA) define traits for time phases of the Greven Knoll Pattern of the Encinitas Tradition applicable to inland San Bernardino, Riverside, Los Angeles and Orange counties (Sutton and Gardner 2010). This pattern is subsequently replaced

in the PA by the San Luis Rey Pattern of the Palomar Tradition later in time (Sutton 2011; Table 1).

Greven Knoll sites tend to be in located in the inland valley areas characteristic of the PA. These inland people apparently did not switch from the use of manos and metates to the use of pestles and mortars that is seen in coastal sites dating to approximately 5000 years ago, possibly reflecting their closer relationship with desert cultural peoples who did not exploit acorns. The Greven Knoll toolkit is dominated by manos and metates throughout its 7,500 year extent. In Phase I, other typical characteristics were pinto dart points for atlatls or spears, charmstones, cogged stones, absence of shell artifacts, and flexed position burials (Table 1). In Phase II, Elko dart points for atlatls or spears and core tools are observed along with increased indications of gathering. In Phase III, stone tools including scraper planes, choppers and hammerstones are added to the tool kit, and yucca and plant seeds are staple foods, animals bones are heavily processed (broken and crushed to extract marrow), and burials tend to be marked by stone cairns (Table 1; Sutton and Gardner 2010).

San Luis Rey I sites tended to be located near viable water sources like creeks. Settlement was diffuse and characterized by considerable movement in a series of seasonal settlements along major tributaries. Territories were eventually defined by watersheds of the tributaries. San Luis Rey I reflects the transition from Encinitas technologies including the possible appearance of bedrock metates (slicks), occasional mortars with associated manos and pestles, the appearance of Cottonwood Triangular arrow points, bone awls, and stone ornaments. There was also a decrease in the use of scrapers. The Encinitas forager settlement and subsistence system continued, however, upland resources were increasingly used. The Cottonwood Triangular projectile point is the major technological marker for the San Luis Rey I period. Projectile points were rare in the Encinitas components, so the bow and arrow reflects a major change in technology and subsistence strategies. Pottery and ceramic figurines are conspicuously absent and it is likely that the San Luis Rey I people did not produce rock art, though there are some undated petroglyphs in the area (Sutton 2011).

By the beginning of San Luis Rey II, a system of larger and more sedentary winter and summer villages were established near permanent water. The winter villages would be located in the river valley while summer villages would be located on the mountain. Material culture from San Luis Rey I continued to San Luis Rey II. However, there is a notable appearance of Tizon Brown pottery and small quantities of Lower Colorado Buff Ware, which was imported from the east. Cottonwood Triangular projectile points continued to be used, but had deep concave bases and were much lighter than they were in San Luis Rey I. Euroamerican materials like glass beads and metal knives appeared during San Luis Rey II. There was also an increase in bedrock milling features with mortars, metates, and slicks along with cupule boulders and rock rings. Ceramic figurines and straight ceramic pipes also appeared in San Luis Rey I and continued in San Luis

Ray II. Shell beads became more common and obsidian was generally rare within San Luis Rey II sites. Primary cremation in pits appears to be the main mortuary practice at the end of San Luis Rey I and through San Luis Rey II (Sutton 2011).

Table 1. Cultural Patterns and Phases

Phase	Dates B.P.	Material Culture	Other Traits
Greven Knoll I	8,500 to 5,000	Abundant manos and metates; Pinto dart points for atlatls or spears; charmstones, cogged stones, and discoidals rare; no mortars or pestles; and general absence of shell artifacts.	No shellfish; hunting important; flexed inhumations; and cremations rare.
Greven Knoll II	5,000 to 3,000	Abundant manos and mutates; Elko dart points for atlatls or spears; core tools; late discoidals; few mortars and pestles; and general absence of shell artifacts.	No shellfish; hunting and gathering important; flexed inhumations; and cremations rare.
Greven Knoll III (formerly Sayles complex)	3,000 to 950	Abundant manos and mutates; Elko dart points for atlatls or spears; scraper planes, choppers, and hammerstones; late discoidals; few mortars and pestles; and general absence of shell artifacts.	No shellfish; yucca and seeds as staples; hunting important but animal bones also processed; flexed inhumations beneath rock cairns; and cremations rare.
San Luis Rey I	1,250 to 500	Transition from La Jollan technology, including a decrease in the use of scrapers and increase in the use of mortars and pestles. The appearance of bow and arrow technology including Cottonwood points, bone awls, stone and shell ornaments, and possibly ceramic pipes. Obsidian Butte glass and "recognizable" middens. Pottery and ceramic figurines are absent.	Use of small temporary camps, the establishment of a relatively small number of villages with some focus on coastal resources. Mortuary customs unclear but perhaps some inhumation in early San Luis Rey I with primary pit cremation increasing to be the principal method by late San Luis Rey I.
San Luis Rey II	500 to 150	Addition of Tizon Brown pottery and ceramic figurines and ceramic pipes definitely present. San Luis Rey style of rock art with the addition of Euroamerican material culture like glass beads and metal tools.	Change of settlement pattern to fewer villages closer to Euroamerican settlements; use of other domesticated species from Euroamericans and the apparent adoption of the *Chingichngish* religion. Loss of territory in the interior valleys to Peninsular III groups moving west from the northern Coachella Valley. Primary pit cremation as the principal mortuary practice and no formal cemeteries.

Note: Adapted from Sutton and Gardner 2010 and Sutton 2011

ETHNOGRAPHY

The PA is located within the historical territory of the Luiseño (Kroeber 1925; Figure 3). Luiseño is a language of the Cupan group of the Takic subfamily of Uto-Aztecan. Other Cupan languages were spoken by the Cupeño, Cahuilla, and Gabrieliño. These groups occupied

territories north and east of the Luiseño. The Diegueño (or Ipai), whose territory abutted that of the Luiseño to the south, spoke a Yuman language.

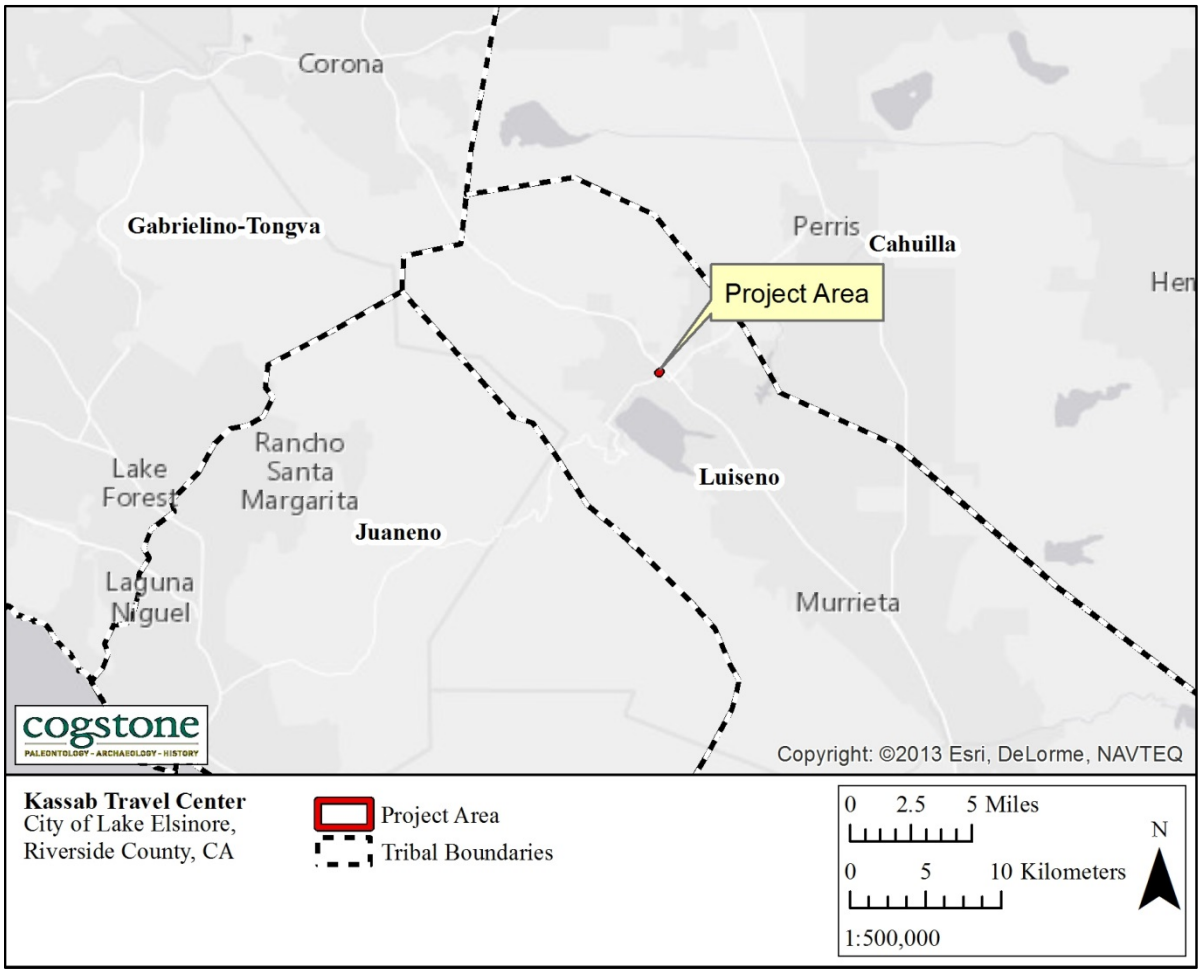

Figure 3. Tribal Boundaries

The integral geographic and sociopolitical unit of the ethnohistoric Luiseño was the rancheria, with included one or more village locations. Luiseño social structure included complex ranks of shamans and secular leaders who guided the rancheria in community social and political tasks and for successful resource exploitation (White 1963:121). More specific details of Luiseño social structure are difficult to reconstruct due to the effects of missionization. It is clear, however, that Luiseño society was patrilineal and exogamous (White 1963). Certain parcels of land containing oak trees and other food resources traditionally used were generally recognized as belong to a specific lineage (Dubois 1908). It is unclear whether Luiseño lineages formed larger kinship units prior to historic contact.

Abundant natural resources along the valley floor sustained semi-permanent villages whose residents claimed additional lands on Palomar Mountain (Gifford 1918). The traditional

settlement pattern consisted of secondary and autonomous village groups, each with specific hunting, collecting, and fishing areas located in diverse ecological zones. Typically these were in valley bottoms, along streams or along coastal strands near mountain ranges (Bean and Shipek 1978:551).

Two or more permanent base camps were used along with number of special purpose camps such as quarry sites, hunting blinds and milling stations (True et al. 1974:78; True and Waugh 1983:109-114). One base camp was the winter village, which was occupied continuously for four to six months annually; this was where most ceremonies took place. Winter villages were generally located in sheltered valleys and often featured pictographs associated with rituals. The other base settlement was the late summer/fall, acorn-gathering and hunting camp, located near oak trees owned by the village group. The entire village lived and worked together in such base camps.

In spring, the winter village group was divided into smaller family groups. These would occupy different areas where fresh vegetables resources were available, or they would go to the coast for shellfish gathering. The spring disaggregation is a normal occurrence in gathering societies. It occurs after winter supplies have been depleted and compensates for the paucity of spring resources. The late summer/fall camps were also subdivisions of the main villages group and were occupied by kin-groups. The major coalescence occurred in the winter villages, after the varied resources were gathered and the subsistence of the village was assured for a period of time.

Several successive ceremonies took place following the death of an individual. After creation of the deceased, the *Tuvish* or ritual washing of clothes was observed as part of a night of singing and dancing. This is followed by the *Chuchamish*, a ritual burning of clothing. The *Tauchanish* was a public ceremony to commemorate the dead of the year, or several years, marked by the display and burning of images of the dead made of rushes, but often hung with valuable clothing and beads (Kroeber 1925:675). If the deceased had been a chief, and *Ashwut marknash* or eagle killing was anniversary ceremony, followed by ritual burial or burning or the eagle's body (Kroeber 1925:767-677).

With respect to precontact Luiseño population estimates, Kroeber (1925:649) opined that 3,000 was a low figure and 4,000 a liberally-allowed maximum. In 1856 the Indian Office reported over 2,500; in 1870, 1,300; in 1885, 1,150. Tribal discrimination is likely to have been inaccurate. Today there are less than 500, according to the Federal census.

Although the use of objects fashioned from wood, pelts, feathers, and fiber were reported for the Luiseño, these are unlikely to survive in the archaeological record and thus probably would not be part of an assemblage from a prehistoric site. Archaeologically, objects such as ceramic pot

sherds, grooved, stone arrow shaft straighteners, deer antler flaking tools, pestles, manos, permanent and portable mortars and metates, gaming stones, beads and various other stone tools and associated debitage have been found at many sites (Sparkman 1908:206, 210-211; Bean and Shipek 1978).

HISTORIC SETTING

Spanish Franciscan father Juan Santiago was the first European to document Lake Elsinore during his exploration east from the Mission San Juan Capistrano in 1797. The *Laguna Grande* was described as being little more than a swamp about a mile long in 1810, but the lake grew larger and by the early 19th century it became a spot to camp and water animals for Mexican rancheros, American trappers, explorers, and immigrants during the California Gold Rush. (City of Lake Elsinore 2017)

Julian Manriquez acquired the land grant for Rancho La Laguna on January 7, 1844, which included the lake. In 1851 Abel Stearns acquired the rancho and sold it to Augustin Machado in 1858 (see Table 5). Rancho La Laguna was a regular stop on the Butterfield Overland Mail route between Temecula and Temescal. After a flooding event in 1862, the Union Army created a post at the lake to graze and water their horses. A drought occurred shortly after between 1862 and 1865, and most of the cattle died and the lake dried out. Despite this, the Machado family continued to own La Laguna Rancho until 1873, when the majority of the rancho was sold to Charles A. Sumner. (City of Lake Elsinore 2017)

In 1883 Franklin H. Heald and his partners Donald Graham and William Collier bought the remaining rancho in order to start a new town. In 1884 the California Southern Railroad built a line from Colton to link to San Diego, and the La Laguna rail station was built within the present day City of Lake Elsinore. On April 20, 1888 Lake Elsinore was incorporated and was originally in San Diego County until the creation of Riverside County in 1893. In 1888 the economy was supported by coal, clay, and gold mining as well as ranching and the agriculture of fruit and nuts. (City of Lake Elsinore 2017)

In the early 1900s the City was popular with celebrities and many of their homes still exist in the City surrounding the lake. During World War II, the lake was used to test seaplanes and a Douglas Aircraft plant making wing assemblies for Boeing B-17 Flying Fortress bombers was established. The lake dried out and was refilled several times during the 20th century, but eventually a project was implemented to maintain the water supply at a consistent level after massive flooding in 1980. The City of Lake Elsinore continues to be one of California's fastest growing cities, having grown from a small lakeside town with a population of 3,800 people in 1976 to a community of 51,821 people in 2010. (City of Lake Elsinore 2017)

PROJECT AREA HISTORY

The 1901 USGS Elsinore 1:250,000 topographic map shows the Southern California Railroad running along Collier Avenue. There are two recorded structures near the PA intersection of Collier Avenue and Riverside Drive in an area named "North Elsinore." The 1953 USGS Elsinore 7.5' topographic map shows the former Southern California Railroad as the Atchison, Topeka and Santa Fe Railroad (ATSF). The two structures documented in 1901 remain and are located directly to the south of the PA. An unnamed reservoir is located within the PA at the southwest quadrant of the Collier Avenue and Riverside Drive intersection. Both the two structures and the Reservoir are present in the 1997 USGS 7.5' Lake Elsinore topographic map. The earliest historic aerials for the PA date to 1967 and show the former reservoir within the PA in the southwest quadrant of the Collier Avenue and Riverside Drive intersection. A complex of structures, obscured by trees is located to the south of the PA. Both the Reservoir and complex of buildings are present in the 1980 aerial. In 1994, the complex of building to the south of the PA and the Reservoir are no longer visible.

SOURCES CONSULTED

CALIFORNIA HISTORIC RESOURCES INVENTORY SYSTEM

Megan Wilson, a Cogstone Archaeologist, performed a search for archaeological and historical records on May 24, 2017 at the Eastern Information Center (EIC) of the California Historical Resources Inventory System (CHRIS) located at the University of Riverside. The record search covered a one-mile radius around the PA.

The results of the records search indicated that no prior studies have been completed within the boundaries of the PA, while 31 studies have been completed previously within a one-mile radius of the PA (Table 2). The previous studies within the one-mile radius of the PA included seven conducted within a 0-0.25 mile radius of the PA, eight conducted within a 0.25-0.5 mile radius, and 16 conducted within a 0.5-1 mile radius of the PA.

Table 2. Previous Studies Within a One-Mile Radius of the Project Area

Report No.	Author(s)	Title	Year	Distance from PA
RI-00093	Marsh, Amanda F.	Glen Valley Pipeline Woodcrest, Riverside County, Expected Impact on Archaeological Resources	1973	0-0.25
RI-00786	Davis, Emma Lou and Jacqueline Nichols	Outline Draft of Evaluation of Early Human Activities and Remains in the California Desert	1979	0-0.25

Report No.	Author(s)	Title	Year	Distance from PA
RI-01013	Hammond, Stephen	Cultural Resources Survey of Two Materials Sources, Murrieta Creek and the Joe Deleo, Jr. Property, Riverside County, California	1978	0.5-1
RI-01718	Bouscaren, Stephen	An Archaeological Assessment of 44 Acres of Land North Of Lake Elsinore, Riverside County, California	1983	0.5-1
RI-01793	Lerch, Michael K. and G.A. Smith	Cultural Resources Assessment of the Proposed Lake Elsinore Management Project, Riverside County, California	1984	0.25-0.5
RI-01888	Salpas, Jean	An Archaeological Assessment of Proposed Class II Sanitary Landfill Site No. 11, Riverside County, California	1984	0.5-1
RI-02027	Brock, James	Archaeological Assessment of the Eda Grant Project Areas, City of Lake Elsinore	1986	0.25-0.5
RI-02351	Drover, C.E.	An Archaeological Assessment of the Biddle Property Feasibility Study Temescal Canyon, Riverside County, California	1987	0.5-1
RI-02627	Brown, Joan C.	Cultural Resources Reconnaissance for the Pacific West Outlet Center, Lake Elsinore, Riverside County, California.	1989	0.5-1
RI-02629	Sturm, Bradley L.	Archaeological Investigations at Ca-Riv-4110 And Ca-Riv-3858, Lake Elsinore, California.	1992	0.25-0.5
RI-03282	Drover, Christopher E.	A Cultural Resource Assessment: SKR Habitat Fence Project, Lake Skinner, Riverside County, California	1991	0.5-1
RI-03311	Evans, Stuart A.	Cultural Resources Reconnaissance of Project Number 533-0769-78, 27 Acres in Elsinore, Riverside County, California	1990	0.25-0.5
RI-03723	Kice, David and Nancy Desautels	Cultural Resources Assessment of the Collier Avenue Improvement Project Area, Riverside County, California	1993	0.5-1
RI-03876	Whitney-Desautels, Nancy A. and Robert M. Beer	Archaeological Survey and Inventory Report, North Peak Project.	1999	0-0.25
RI-04007	Allen, Kathleen C.	Archaeological Assessment Of L.A. Cellular Site #669.3, Abandoned Reservoir Site On Sunny Slope Avenue, City of Lake Elsinore, Riverside County, California	1996	0.5-1
RI-04008	Duke, Curt	Letter Report: Cultural Resource Assessment for AT&T Wireless Services Facility Number C6693, County of Riverside, California.	1999	0.5-1
RI-04144	Love, Bruce And Bai "Tom" Tang	Cultural Resources Report: Temescal Valley Regional Interceptor, Santa Ana Watershed Project Authority, Riverside County, California	1998	0-0.25
RI-04201	Dillon, Brian D Ph.D.	Cultural Resources Assessment, City of Lake Elsinore Wastewater Treatment Plant Expansion Project, Riverside County, California.	1999	0.5-1

Report No.	Author(s)	Title	Year	Distance from PA
RI-04421	LSA Associates, Inc.	Appendix B-Cultural Resources. In: Measure A Program Project Alternatives Analysis-Environmental Component, Technical Appendix Volume I	1990	0.5-1
RI-04463	Macko, Michael E.	Archaeological Survey Report of Amcor Properties, Inc. 600-Acre French Valley Specific Land Use Plan, Riverside County, California	1989	0.5-1
RI-04725	Mclean, Deborah	Letter Report: Cultural Resource Assessment of the Lake Elsinore Forest Fire Station Relocation in the City of Lake Elsinore, Riverside County, California	2000	0.25-0.5
RI-04815	York, Andrew And Jane E. Wooley	Cultural Resources Evaluation of Oak Valley, Riverside County, California	1987	0.25-0.5
RI-05321	Goodwin, Riordan	Cultural Resource Assessment, Central Avenue Parcels (APN's 377-120-007 and -008) City of Lake Elsinore, Riverside County, California	2004	0.25-0.5
RI-05324	Mclean, Deborah	First Supplemental Historic Property Survey Report- Negative Findings	2002	0.5-1
RI-05529	Tejada, Barbara	Historical Resources Compliance Report (District 8, Riverside County, Route 74, K.P. 23.9/R24.4. P.M.14.82/R15.16)	2005	0.5-1
RI-06888	Lerch, Michael K. And Gray, Marlesa A.	Cultural Resources Assessment of the Valley-Ivyglen Transmission Line Project, Riverside County, California	2006	0-0.25
RI-06987	Glenn, Brian K.	Letter Report: Due Diligence Cultural Resources Assessment Letter Report for Approximately 4.27-Acre Central and Dexter Project Area, City of Lake Ellsinore, County of Riverside, California	2006	0.5-1
RI-07342	Iverson, Dave	Letter Report: Cultural Resources Study for the Caliber Commercial Project (Crossroads), City of Lake Elsinore, Riverside County, California	2007	0.5-1
RI-08679	Jay K. Sander	Archaeological Survey Report for Southern California Edison's Pole Replacement Project	2010	0.25-0.5
RI-09105	Anonymous	Tractor Supply Co. Project (Commercial Design Review No. 2014-01& Conditional Use Permit No. 2014-01) Initial Study for Mitigated Negative Declaration No. 2014-01	2014	0-0.25
RI-09377	Roberta Thomas	Cultural Resource Monitoring Report for the Arroyo del Toro Channel Project, Lake Elsinore, Riverside County, California	2014	0-0.25

The records indicated that no previously recorded cultural resources are located within the boundaries of the PA. A total of fifteen cultural resources have been previously documented outside of the PA but within the one-mile radius of the PA (Table 3). These consist of one prehistoric archeological site, three prehistoric archaeological isolates, six historic archaeological

sites, two historic archaeological isolates and three historic built environment resources. Of these, six are located within 0-0.25 mile radius of the PA, three are recorded within 0.25-0.5 mile radius of the PA, and six are recorded within a 0.5-1 mile radius of the PA.

Table 3. Previously Recorded Resources Within a One-Mile Radius of the Project Area

Primary No.	Trinomial	Resource Type	Description	Year Recorded	Distance from PA
P-33-003832	CA-RIV-003832	Historic Resource	Railroad: Atchison Topeka and Santa Fe Railroad, Santa Fe Railroad grade through the Temescal Valley	1990, 1990, 1996, 2001, 2005 , 2006, 2011	0.5-1
P-33-013802	-	Prehistoric Isolate	Unifacial mano	2004	0.5-1
P-33-013803	-	Prehistoric Isolate	Unifacial mano	2004	0.5-1
P-33-015364	CA-RIV-008120	Historic archaeological site	Historic trash scatter	2006	0.5-1
P-33-015420	CA-RIV-008132	Historic Resource	Cemetery: The Elsinore Valley Cemetery and Home of Peace Jewish Cemetery	2006, 2007	0-0.25
P-33-015793	-	Prehistoric isolate	Bifacial mano	2007	0-0.25
P-33-015794	CA-RIV-008226	Historic archaeological site	Foundations/structure pads and historic trash scatter	2007	0-0.25
P-33-016218	CA-RIV-008367	Historic archaeological site	Historic trees and trash scatter	2007	0-0.25
P-33-016641		Prehistoric archaeological site	Bedrock milling features	2007	0-0.25
P-33-017019		Historic resource	Multiple family property, vernacular bungalow: 1959	2008	0-0.25
P-33-017020	CA-RIV-008861	Historic archaeological site	Historic can scatter	2007	0.25-0.5
P-33-017022	CA-RIV-008862	Historic archaeological site	Foundations/structure pads	2008	0.25-0.5
P-33-017026	CA-RIV-008865	Historic archaeological site	Foundations/structure pads	2007	0.25-0.5
P-33-024666	-	Historic isolate	Body fragment of a "Gordon's London Dry Gin" bottle	2015	0.5-1
P-33-024667	-	Historic isolate	Neck fragment of glass beverage bottle	2015	0.5-1

OTHER SOURCES

In addition to the records at the EIC, a variety of sources were consulted by Megan Wilson in May 2017 to obtain information regarding the PA (Table 4). Sources include the National

Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), California Historical Resources Inventory (CHRI), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI) and local historical registers. Specific information about the PA, obtained from historic maps, is presented in the Project Area History section.

Table 4. Additional Sources Consulted

Source	Results
National Register of Historic Places (NRHP; 1979-2002 & supplements)	Negative
Historic USGS Topographic Maps	The 1901 Elsinore 1:250,000 topographic map shows the Southern California Railroad running along Collier Avenue. There are two recorded structure near the PA intersection of Collier Ave and Riverside Dr. in an area named "North Elsinore". The 1953 Elsinore 7.5' topographic map show the former Southern California Railroad as the ATSF Railroad. The two structures documented in 1901 remain and are located directly to the south of the PA. A Reservoir is located in the PA at the southwest quadrant of the Collier Ave. and Riverside Dr. intersection. Both the two structures and the Reservoir are present in the 1997 7.5' Lake Elsinore topographic map.
Historic US Department of Agriculture Aerial Photographs	The earliest historic aerials for the PA date to 1967 and show a former reservoir within the PA in the southwest quadrant of the Collier Ave. and Riverside Dr. intersection. A complex of structures, obscured by trees is located to the south of the PA. Both the reservoir and complex of buildings are present in the 1980 aerial. In 1994, the complex of building to the south of the PA and the reservoir appear to be razed.
California Register of Historical Resources (CRHR; 1992-2014)	Negative
California Historical Resources Inventory (CHRI; 1976-2014)	Negative
California Historical Landmarks (CHL; 1995 & supplements to 2014)	Negative
California Points of Historical Interest (CPHI; 1992 to 2014)	Negative
Caltrans Historic Bridge Inventory (Caltrans 2016)	Negative
Bureau of Land Management (BLM) General Land Office Records	Positive, see Table 5

Table 5. Land Patents

Name(s)	Year	Authority	T; R; Section
Southern Pacific Railroad	1885, 1896	Atlantic-Pacific Railroad Grant	T: 5S; R: 4W, Section 31
Able Stearns	1872	Spanish/Mexican Land Grant	T: 5S; R: 4W, Section 31 and :5S; R: 5W, Section 36
USA	1973, 1875	N/A	T:5S; R: 5W, Section 36

SACRED LANDS FILE SEARCH

On June 6, 2017 a Sacred Lands File search was requested from the Native American Heritage Commission (NAHC). The NAHC responded on June 7, 2017 that the Sacred Lands File search was negative for resources within the PA (Appendix B).

NATIVE AMERICAN CONSULTATION

The City of Lake Elsinore is conducting Native American Consultations to meet their requirements under Assembly Bill 52 (AB52). Cogstone, on behalf of the City, drafted and sent the letters to the tribes on December 20, 2017. Three responses were received within the 30 day time period (Appendix C).

On January 8, 2018 Tuba Ebru Ozdil, on behalf of the Pechanga Band of Luiseño Mission Indians, responded via letter that the Project lies within a sensitive area for the Tribe and that there were numerous recorded cultural resources within a one-mile radius of the Project. She stated that there were also several place names, known village locations, and recorded Traditional Cultural Places (TCPs) within the vicinity. For these reasons, the Pechanga believes that the possibility for encountering resources during excavation for the Project is high. Pechanga requested government-to-government consultation with the City and to be included in all correspondence regarding this Project.

On January 18, 2018 Joseph Ontiveros, on behalf of the Soboba Band of Luiseño Indians, responded to the City via letter that the tribe requested to initiate formal consultation with the City and could be contacted to schedule a meeting.

On January 18, 2018 Katie Croft, on behalf of the Agua Caliente Band of Cahuilla Indians, responded via e-mail that the Project was not located within the Tribe's Traditional Use Area and deferred consultation to the other tribes in the area.

As of February 20, 2018, the City of Lake Elsinore is still in consultation with the tribes.

SURVEY

METHODS

The survey stage is important in a project's environmental assessment phase to verify the exact location of each identified cultural resource, the condition or integrity of the resource, and the proximity of the resource to areas of cultural resources sensitivity. All undeveloped ground surface areas within PA were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools or fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic-era debris (e.g., metal, glass, ceramics). Existing ground disturbances (e.g., cutbanks, ditches, animal burrows, etc.) were visually inspected. Photographs of the PA, including ground surface visibility and items of interest, were taken with a digital camera.

RESULTS

An intensive pedestrian survey was conducted by Megan Wilson of the entire 2.39 acre PA on May 24, 2017. Ground visibility was limited (30 percent) due to tall, dense, invasive weeds throughout the PA (Figures 3 & 4). The PA was flat with silty sands. In addition, concrete chunks and decomposed asphalt were scattered throughout the PA (Figure 5). The PA is disturbed in the south by homeless camps that were vacant at the time the survey was conducted. No cultural resources were observed during the survey.

Although the visibility within the PA is low, the aerials from 1967 show that the area was completely developed with a reservoir within the PA with associated buildings to the south of the PA. The reservoir and buildings were still present in 1980, but are absent in the 1994 aerial. The concrete and asphalt chunks observed within the PA during the survey are likely associated with the now-demolished reservoir and buildings. For this reason, it is unlikely that there will be any impact to cultural resources within the PA as the area has been previously developed and is highly disturbed.

Figure 4. View of PA from Riverside Drive, View North

Figure 5. View from Center of PA Toward Collier, View North

Figure 6. Example of Concrete Chunks Located Within PA, Plan View

CONCLUSIONS AND RECOMMENDATIONS

Identification efforts by Cogstone for this cultural resources assessment included a review of existing literature and historic maps, a record search conducted at the EIC, and an intensive pedestrian survey. No cultural resources have been previously recorded or were observed within the PA during the pedestrian survey.

The City of Lake Elsinore is conducting Native American Consultations to meet their requirements under Assembly Bill 52 (AB52). Cogstone, on behalf of the City, drafted and sent the letters to the tribes on December 20, 2017. Three responses were received within the 30 day time period. As of February 20, 2018, the City of Lake Elsinore is still in consultation with the tribes.

The shallow depth of excavation and the lack of archaeological sites in the Project vicinity and the disturbance of the PA due to previous development (reservoir) indicate that the potential for discovery of intact archaeological deposits, including unknown buried archaeological deposits, materials, or features, by the implementation of this Project is low. No further cultural resources work is necessary. No further cultural resources work is necessary.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist evaluates it. In the unlikely event that human remains are encountered during Project development, all work must cease near the find immediately.

In accordance with California Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods. Work may not resume in the vicinity of the find until all requirements of the health and safety code have been met.

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APPENDIX A. QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

HOLLY DUKE
Task Manager/Archaeologist

EDUCATION

2009 B.A., Archaeology/History, Simon Fraser University, Canada

SUMMARY QUALIFICATIONS

Ms. Duke is a qualified archaeologist and cross-trained paleontologist with over four and a half years of experience in survey, monitoring, excavation, and the identification of human and faunal skeletal remains. She is Cogstone's Lab and Data Manager. Her laboratory responsibilities include: identification and analysis of human skeletal remains; cleaning and identification of faunal bones for inclusion in faunal collections; measuring and cataloging prehistoric and historic artifacts; washing, sorting, and identifying seeds; as well as fossil preparation and stabilization. As Data Manager, she is responsible for the organization of field data, lab supervision and organization, and maintaining the iPads used for data collection in the field.

Crowder Canyon, Caltrans District 8, San Bernardino County, CA. The project consisted of the realignment of SR-138. Participated in the archaeological testing and data recovery of two archaeological sites near Hesperia. Conducted excavation and data recovery of more than six prehistoric features. Sub to Applied Earthworks. Archaeologist. 2016

Longboat Solar Photovoltaic, EDF Renewable Energy, Cities of Barstow and Lenwood, San Bernardino County, CA. The project involved construction of a solar energy facility within an approximately 234 acre property. Cogstone conducted cultural resources Phase I and Extended Phase I studies. Tasks included archaeological and paleontological resources records search, Sacred Lands search, Native American consultation. Identified and cataloged all artifacts recovered, delivered artifacts to tribes for repatriation. Sub to Environmental Intelligence. Archaeologist/Lab and Data Manager. 2015-present

Fisher House and Golf Course Parking Lot Project, Veterans Affairs Long Beach Healthcare System, City of Long Beach, Los Angeles County, CA. In compliance with the Historic Properties Treatment Plan, supported an archaeological testing program to identify cultural resources by utilizing ground penetrating radar and magnetometry, shovel test pits, and mechanical excavation. Recovered numerous historic artifacts from a trash dump during ground disturbing activities within the Golf Course Parking Lot project area. Cleaned, identified, and cataloged all recovered artifacts. Monitored excavation for utilities at Golf Course Parking Lot project. Prime. Archaeologist/Lab and Data Manager. 2015-2016

Del Sur Solar EIR, City of Lancaster, Lancaster, CA. The project consisted of the construction of a 100 MW solar facility on ~725 acres and a 2-4 mile gen-tie line to SCE's Antelope Substation. Tasks included a cultural resources assessment on behalf of the City of Lancaster. Participated in the field survey, recorded sites on DPR series 523 forms, drafted sections of technical report for inclusion in the cultural resources section of the EIR document. Sub to Aspen. Archaeologist/ Lab and Data Manager. 2015

Bodie Hills FY14-15 Cultural Resources Survey, Desert Restoration Project, Bureau of Land Management, Bishop Field Office, Mono County, CA. The project consisted of a Class III Cultural Resources Inventory survey of 2,721 acres of BLM land identified for vegetation management. Conducted intensive pedestrian survey, organized and maintained data collected in the field, and prepared site records for final report. Prime. Archaeologist/Lab and Data Manager. 2014-2015

Metropole Vault Replacements, Southern California Edison, Avalon, Catalina Island, Los Angeles County, CA. Participated in archaeological monitoring and data recovery excavations. Responsible for collections management of all artifacts and remains during excavation. Created spreadsheet databases to manage artifacts and features. Identified, cleaned, and recorded human remains per the MLD's instructions. Assisted with repatriation of human remains prior to construction completion. Managed and organized field photos and feature data after construction was complete. Prime. Archaeologist/Osteologist /Lab and Data Manager. 2014

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

MOLLY VALASIK
Principal Archaeologist II

EDUCATION

2009 M.A., Anthropology, Kent State University, Kent, Ohio
2006 B.A., Anthropology, Ohio State University, Columbus, Ohio

EXPERIENCE

Ms. Valasik is a Registered Professional Archaeologist with eight years of professional experience. She is a skilled professional who is well-versed in the compliance procedures of CEQA and Section 106 of the NHPA and regularly prepares cultural resources assessment reports for a variety of federal, state, and local agencies throughout California. She has managed local assistance projects involving sidewalk, road, interchange, and bridge improvements with Caltrans/FHWA as the lead agency. In addition, she has prepared cultural resources reports for CEQA/EIR compliance documents for project-level and program-level Specific Plans, General Plans, Master Plans, and Zoning Amendments for mixed-use, residential, commercial and industrial developments. She meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*

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SELECTED PROJECTS

Old Town Streetscape, Phase 2, Caltrans District 3, City of Elk Grove, Sacramento County, CA. The City proposed construction of bump outs, sidewalk widening, bus lanes, etc. within a National Register-listed historic district. Managed cultural studies including record search, Sacred Lands File search, Native American consultation, intensive-level pedestrian archaeological and architectural surveys, as well as coordination and approval by District 3 of an APE map. The District record was updated. Author of Archaeological Survey Report and Historic Properties Survey Report. Sub to Michael Baker/PMC. Project Manager/Principal Investigator. 2016

SR-138 Palmdale Boulevard PA/ED (Sierra Highway), Caltrans District 7, City of Palmdale, Los Angeles County, CA. The project involved widening State Route 138 and Sierra Highway. Managed cultural studies including record search, Sacred Lands File search, Native American consultations, and intensive-level pedestrian archaeological survey, as well as coordinated approval by District 7 of an APE map. Co-author of the Archaeological Survey Report and Historic Properties Survey Report. Sub to Parsons Transportation. Project Manager/Principal Investigator. 2016

Paradise Valley Specific Plan, County of San Bernardino, near Indio, CA. The proposed project, encompassing 5,411 acres, consists of the construction of a planned community. Directed archaeological survey and extended Phase I activities. Lead author of assessment report. Managed subsequent supplemental survey and updated report. Sub to Envicom. Field Director and GIS Manager. 2011-2013; 2014; 2016

Arlington Avenue Widening, Caltrans District 8, City of Riverside Public Works, Riverside County, CA. The City proposed widening Arlington Avenue one linear mile in order to construct safety improvements. Managed cultural studies including record search, Sacred Lands File search, Native American consultations, and intensive-level pedestrian archaeological survey of the 5-acre site with negative results, as well as coordinated approval by District 8 of an APE map. Co-author of the Archaeological Survey Report and Historic Properties Survey Report. Sub to Michael Baker. Project Manager/Co-Principal Investigator. 2015

Folsom Boulevard Streetscape Enhancement, Caltrans District 3, City of Rancho Cordova, Sacramento County, CA. The City proposed to construct sidewalks, bike lanes, medians, safety fencing, and street and pedestrian lighting along Folsom Boulevard. Managed cultural studies including record search, Sacred Lands File search, Native American consultations, and intensive-level pedestrian archaeological survey, as well as coordination and approval by District 3 of an APE map. Author of Archaeological Survey Report and Historic Properties Survey Report. Sub to Michael Baker/PMC. Project Manager/Principal Archaeologist. 2015

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

MEGAN WILSON

Archaeologist/GIS Specialist

EDUCATION

2014 M.A. Anthropology, California State University, Fullerton *cum laude*
2013 GIS Certificate, California State University, Fullerton
2006 B.A., Anthropology, University of California, Los Angeles *cum laude*

SUMMARY QUALIFICATIONS

Ms. Wilson is a Registered Professional Archaeologist (RPA) and cross-trained paleontologist with experience in survey, excavation, laboratory preparation/curation analysis, historic archaeology and historic architecture. Ms. Wilson regularly conducts records searches, tribal consultations, completes DPR site records, and gathers historic building information from local municipalities, and assists in drafting archaeological assessment reports for state, federal, and private development projects. She meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. She is GIS proficient and assists with the digitizing and mapping of spatial data for all projects as well as analyzing historic maps. Ms. Wilson has six years of experience in southern California archaeology.

SELECTED PROJECTS

Paradise Valley Specific Plan, Glorious Land Company, unincorporated Riverside County, CA. The project involves construction of a master-planned community. Of the 5, 000-acre project area, 1,800 acres are slated for development, leaving the remaining 3,200 acres as open space. Coordination with the BLM was required regarding off-site power and fiber optic lines situated on federal lands. Conducted records search and archive research. Cogstone also conducted NAHC consultation, archaeological and paleontological resources survey and APE mapping for inclusion in the Supplemental Phase I Cultural Resources Assessment Report.

High Desert Corridor/ SR 138 Widening Project, FHWA/Caltrans District 7, Los Angeles and San Bernardino Counties, CA. The project involves construction of a new, approximately 63-mile long, east-west freeway/expressway between SR 14 in Los Angeles County and SR 18 in San Bernardino County. Field pedestrian survey for Extended Phase I (XPI) Testing, subsurface testing of four archaeological sites in the Area of Potential Effects (APE), and lab work. Caltrans is the lead federal and state agency; compliance with Section 106 and CEQA required. Tasks included paleontological records, GIS maps, and organizing artifacts. Sub to Parsons Transportation Group. Archaeology Technician. 2014-2015

Dune Palms Bridge, Project Design and Environmental Documents, La Quinta, Riverside County, CA. The project involved replacing a low water crossing spanning the Coachella Valley Storm Water Channel at Dune Palms Road. Conducted record search, sacred lands search, and NAHC consultation. Cogstone also conducted an intensive field survey, APE mapping, and prepared a Historic Properties Survey Report (HPSR) with appended Archaeological Survey Report (ASR) to support the PA&ED/PSR/PS&E documents. In addition, the project is located within known boundaries of prehistoric Lake Cahuilla, which has previously produced significant fossils. Cogstone conducted a paleontological sensitivity analysis and prepared a Paleontological Identification Report (PIR). Sub to Parsons Brinckerhoff. Archaeologist. 2014

I-10 Grove Avenue Interchange, Ontario, San Bernardino County, CA. Archaeological and paleontological records search, historic map search, and NAHC consultation to support preparation of PIR/PER, PMP, HPSR/ASR, and HRER documents. Sub to Parsons Transportation Group. Archaeologist. 2015

Fogarty Substation, Southern California Edison, Lake Elsinore, Riverside County, CA. Prepared maps and graphics for inclusion in a cultural resources monitoring compliance report documenting activities associated with the construction of a water pipeline. Sub to SWCA. GIS Specialist. 2016

APPENDIX B. SACRED LANDS FILE SEARCH RESULTS

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION

Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

June 7, 2017

Megan Wilson
Cogstone

Sent by E-mail: mwilson@cogstone.com

RE: Proposed Kassab Travel Center Project, City of Lake Elsinore; Elsinore USGS Quadrangle, Riverside County, California`

Dear Ms. Wilson:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. Please note that the intent of the reference codes below is to avoid or mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects under AB-52.

As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 **require public agencies** to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

> **Within 14 days** of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.3.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.
   - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and
   - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A search of the SFL was completed for the project with negative results.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

APPENDIX C. NATIVE AMERICAN AB52 CONSULTATION

PECHANGA CULTURAL RESOURCES
Temecula Band of Luiseño Mission Indians

Post Office. Box 2183 • Temecula, CA 92593
Telephone (951) 770-6300 • Fax (951) 506-9491

Chairperson:
Neal Ibanez

Vice Chairperson:
Bridgett Barcello

Committee Members:
Andrew Masiel, Sr.
Darlene Miranda
Evie Gerber
Richard B. Scearce, III
Robert Villalobos

Director:
Gary DuBois

Coordinator:
Paul Macarro

Planning Specialist:
Tuba Ebru Ozdil

January 8, 2018

VIA E-Mail and USPS

Megan Wilson, Archaeologist
Cogstone Archaeology
1518 West Taft Avenue
Orange, CA 92865

RE: Request for Information for the Kassab Travel Center Project located in the City of Lake Elsinore [APNs 378-030-007 and 378-030-009]

Dear Ms. Wilson;

The Pechanga Band of Luiseño Indians ("the Tribe") appreciates your request for information regarding the above referenced Project. After reviewing the provided maps and our internal documents, we have determined that the Project area is not within reservation lands although it is within our ancestral territory.

At this time, we are interested in participating in this Project based upon traditional knowledge of the area. The proposed Project lies within a sensitive area for the Tribe, and there are numerous recorded cultural resources within one mile radius of the project site. In addition, there are several place names, known village locations, and recorded TCPs within close vicinity of the project location. For these reasons, the Tribe believes that the possibility for recovering subsurface resources during any ground-disturbing activities for the Project is high.

The Tribe is dedicated to providing comprehensive cultural information to you and your firm for inclusion in the archaeological study as well as to the Lead Agency for CEQA review. At this time, the Tribe requests the following so we may continue the consultation process and to provide adequate and appropriate recommendations for the Project:

1) Notification once the Project begins the entitlement process, if it has not already;
2) Copies of all applicable archaeological reports, site records, proposed grading plans and environmental documents (EA/IS/MND/EIR, etc.);
3) Government-to-government consultation with the Lead Agency; and
4) The Tribe believes that monitoring by a Riverside County qualified archaeologist and a professional Pechanga Tribe monitor may be required during earthmoving activities. Therefore, the Tribe reserves its right to make additional comments and recommendations once the environmental documents have been received and fully reviewed. Further, in the event that subsurface cultural resources are identified, the

Tribe requests consultation with the Project proponent and Lead Agency regarding the treatment and disposition of all artifacts.

As a sovereign government, the Tribe is entitled to appropriate and adequate government-to-government consultation regarding the proposed Project. For the record, the Tribe does not consider initial inquiry letters from project consultants to constitute appropriate government-to-government consultation, but rather tools to obtain further information about the Project area. Therefore, the Tribe reserves its right to participate in the formal environmental review process, including government-to-government consultation with the Lead Agency, and requests to be included in all correspondence regarding this Project.

Please note that we are interested in participating in surveys within Luiseño ancestral territory. Prior to conducting any surveys, please contact the Pechanga Cultural Resources Department. If you have any additional questions or comments, please contact me at eozdil@pechanga-nsn.gov or 951-770-6313.

Sincerely,

Tuba Ebru Ozdil
Planning Specialist

Pechanga Cultural Resources • Temecula Band of Luiseño Mission Indians
Post Office Box 2183 • Temecula, CA 92592

Sacred Is The Duty Trusted Unto Our Care And With Honor We Rise To The Need

January 18, 2018

Attn: Justin Kirk, Principal Planner
City of Lake Elsinore
Community Development Department, Planning Division
130 South Main Street
Lake Elsinore, CA 92530

RE: AB 52 Consultation; Kassab Travel Center Project – southwest corner of Riverside Drive and Collier Street (APNs 378-030-007, 378-030-009) – City of Lake Elsinore, Riverside County, CA

The Soboba Band of Luiseño Indians has received your notification pursuant under Assembly Bill 52.

Soboba Band of Luiseño Indians is requesting to initiate formal consultation with the City of Lake Elsinore. A meeting can be scheduled by contacting me via email or phone. All contact information has been included in this letter.

I look forward to hearing from and meeting with you soon.

Sincerely,

Joseph Ontiveros, Director of Cultural Resources
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581
Phone (951) 654-5544 ext. 4137
Cell (951) 663-5279
jontiveros@soboba-nsn.gov

Confidentiality: The entirety of the contents of this letter shall remain confidential between Soboba and the City of Lake Elsinore. No part of the contents of this letter may be shared, copied, or utilized in any way with any other individual, entity, municipality, or tribe, whatsoever, without the expressed written permission of the Soboba Band of Luiseño Indians.

From: THPO Consulting
To: "Megan Wilson"
Subject: RE: AB52 Consultation Follow up for the Kassab Travel Center Project
Date: Thursday, January 18, 2018 2:01:34 PM
Attachments: image001.png

Greetings,

A records check of the Tribal Historic preservation office's cultural registry revealed that this project is not located within the Tribe's Traditional Use Area. Therefore, we defer to the other tribes in the area. This letter shall conclude our consultation efforts.

Thank you,

Katie Croft
Cultural Resources Manager
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264
760-699-6829 Office
760-413-6253 Cell
kcroft@aguacaliente.net

From: Megan Wilson [mailto:mwilson@cogstone.com]
Sent: Thursday, January 11, 2018 2:06 PM
To: THPO Consulting <ACBCI-THPO@aguacaliente.net>
Subject: FW: AB52 Consultation Follow up for the Kassab Travel Center Project

Good afternoon,
I am following up on an AB52 request for consultation regarding the Kassab Travel Center Project located in the City of Lake Elsinore, Riverside County.
Attached is a digital version of the original request sent via certified mail on 12/20/2017.
You may forward your comments to me or directly to the lead agency whose contact information is provided on the attached letter.
Thank you,

Appendix D

Paleontological Resources Technical Report

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT FOR THE KASSAB TRAVEL CENTER PROJECT, CITY OF LAKE ELSINORE, CALIFORNIA

Prepared for:
Josh Haskins
Environmental Advisors
2400 E. Katella Avenue, Suite 800
Anaheim, CA 92806

Principal Investigator:
Kim Scott, Principal Paleontologist

August 2017

Project Number: 4083
Type of Study: Paleontological Resources Assessment
Localities: None within five miles of the project in late Pleistocene alluvium
USGS Quadrangle: Elsinore 7.5'
Area: 2.39 acres
Key Words: modern artificial fill (PFYC 1), Holocene to late Pleistocene axial channel deposits (PFYC 2 at surface, PFYC 3a at more than 8 feet deep), early Pleistocene very old alluvial fan (PFYC 3b); negative survey

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Toll free (888) 333-3212

Federal Certifications 8(a), SDB, EDWOSB
State Certifications DBE, WBE, SBE, UDBE

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SUMMARY OF FINDINGS

This purpose of this study was to determine the potential effects on paleontological resources during construction of the Kassab Travel Center Project in the City of Lake Elsinore, Riverside County, California. Planned vertical impacts of this 2.39 acre project are six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

The project surface is mapped entirely as Holocene to late Pleistocene axial channel deposits. Results of the record search indicate that no previous fossil localities have been from late Pleistocene alluvial sediments within five miles of the proposed project. Based on other recorded localities, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep in California valleys.

During the survey, only the surface of the Holocene to late Pleistocene axial channel deposits could be observed. No fossils were encountered during the survey.

The Holocene to late Pleistocene axial channel deposits are ranked as low (Potential Fossil Yield Classification 2) sensitivity at the surface and increasing to moderate and patchy sensitivity (Potential Fossil Yield Classification 3a) at depths of more than 8 ft.

Based on the study findings, fossils are unlikely to be encountered during construction activities. If unanticipated discoveries of paleontological resources occur during construction, all work within 50 feet of the discovery should be halted until the find has been evaluated by a qualified paleontologist.

INTRODUCTION

PURPOSE OF STUDY

This purpose of this study was to determine the potential effects on paleontological resources during construction of the Kassab Travel Center Project (project) in the City of Lake Elsinore, Riverside County, California (Figure 1). This report complies with the California Environmental Quality Act and the City of Lake Elsinore General Plan.

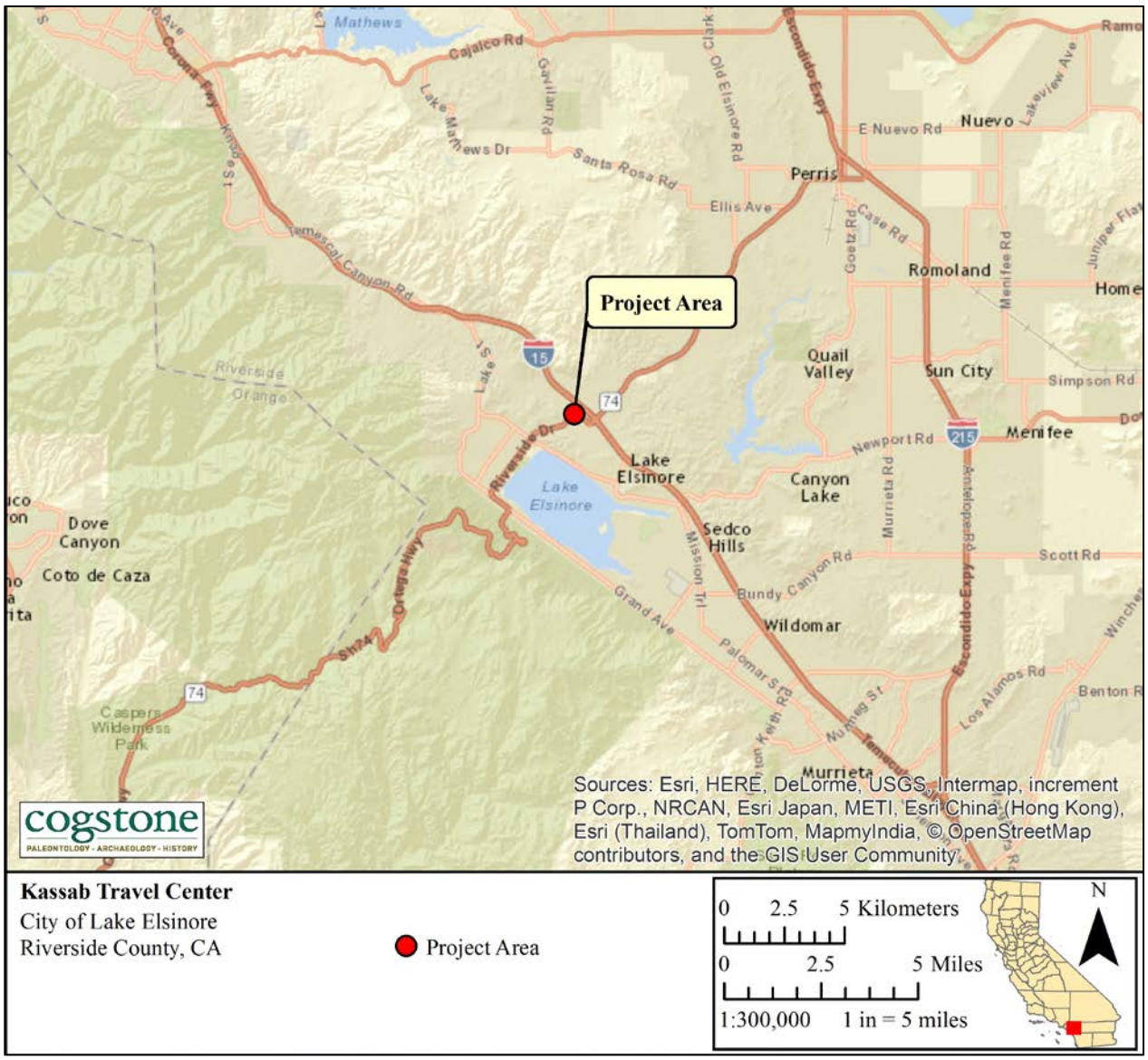

Figure 1. Project vicinity

PROJECT DESCRIPTION AND LOCATION

The proposed Kassab Travel Center will consist of a 6,000 square foot convenience store with three quick serve restaurants, two covered gas dispensing areas totaling 5,264 square feet, and a free standing 2,543 square foot fast food restaurant with a drive-through. Maximum depth of excavation will be six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

This 2.39 acre project is located within the Lake Elsinore 7.5 minute United States Geological Survey (USGS) quadrangle in section 31 of Township 5 South, Range 5 West and section 36 of Township 5 South, Range 4 West, of the San Bernardino Base and Meridian (Figure 2).

PROJECT PERSONNEL

Cogstone conducted the paleontological resources studies and a brief resume of the Principal Investigator are appended (Appendix A). Additional qualifications of key Cogstone staff are available at http://www.cogstone.com/key-staff/

- Kim Scott served as the Principal Paleontologist for the project and wrote this report. Scott has a M. S. in Biology with an emphasis in paleontology from California State University, San Bernardino, a B.S. in Geology with an emphasis in paleontology from the University of California, Los Angeles, and over 20 years of experience in California paleontology and geology.

- Dr. John Harris reviewed this report for quality control. He has a Ph.D. in Geology from the University of Bristol (U.K.), an M.A. in Geology from the University of Texas, Austin, a B.S. in Geology from the University of Leicester (U.K.). Dr. Harris has more than 40 years of experience in Cenozoic paleontology and specializes in terrestrial vertebrate species from Rancho la Brea California and Africa.

- Megan Wilson performed the survey and prepared the Geographic Information System (GIS) maps throughout this report. Wilson has a M.A. in Anthropology from California State University Fullerton, a GIS certification, over five years of experience in California archaeology, and is cross-trained in paleontology.

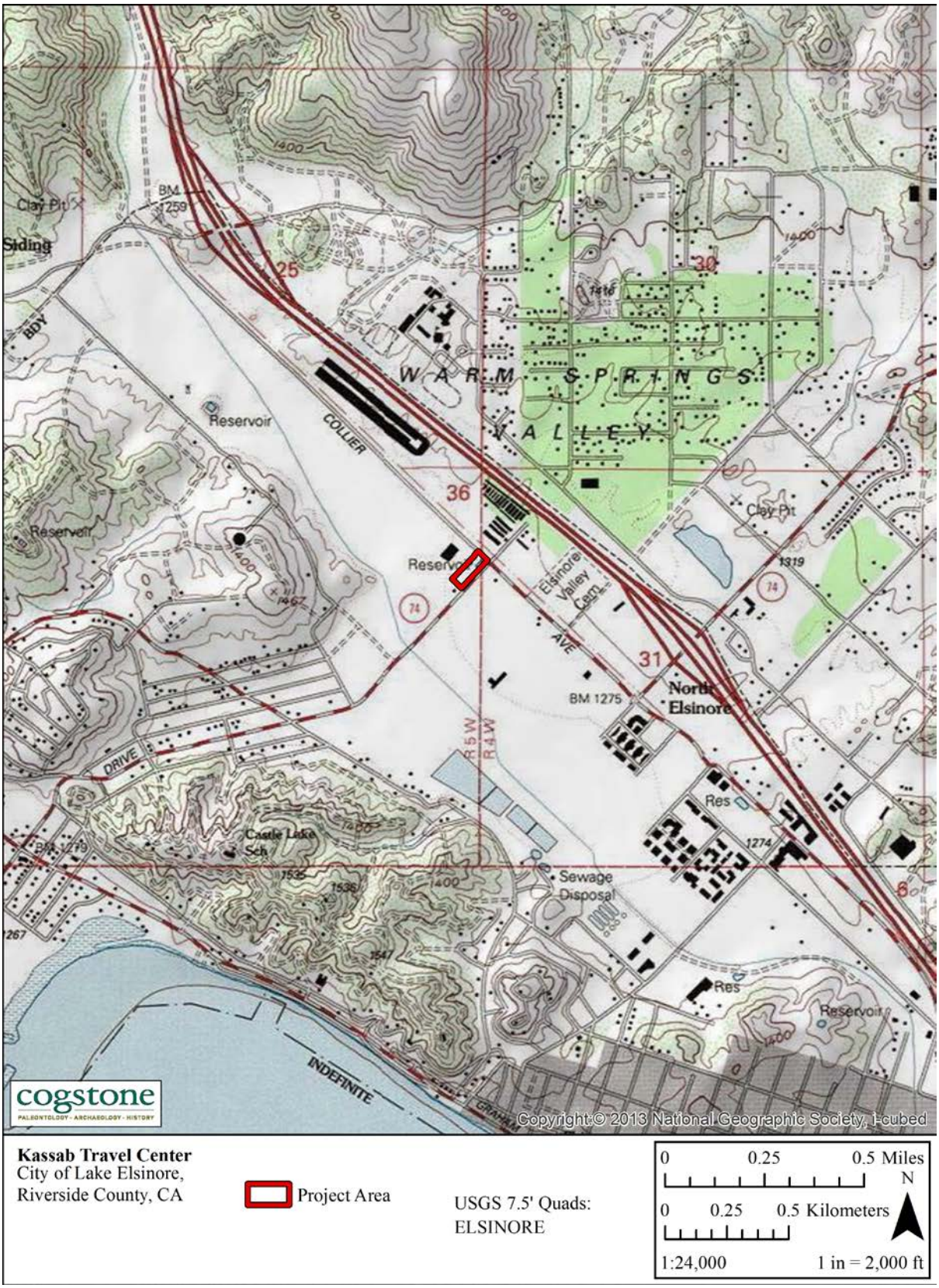

Figure 2. Project location

REGULATORY ENVIRONMENT

STATE LAWS AND REGULATIONS

Paleontological resources are protected by state law. This protection extends to all vertebrate fossils (animals with backbones) and any unique paleontological locality.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. If paleontological resources are identified as being within the proposed project study area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that “No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value.”

CITY OF LAKE ELSINORE

The Project must also comply with the Resource Protection and Preservation Chapter of the Lake Elsinore General Plan approved on December 13, 2011 (Lake Elsinore 2011). The goals and policies for cultural resources are outlined in Goal 6 and Goal 7.

Policy 6.1: Encourage the preservation of significant archaeological, historical, and other cultural resources located within the City.

Policy 7.2: Continue to identify, document, evaluate, designate, and preserve the cultural resources in the City.

Policy 7.3: Continue to update a citywide inventory of cultural resources in conformance with state standards and procedures while maintaining the confidentiality of information as required by law.

PALEONTOLOGICAL RESOURCES SIGNIFICANCE CRITERIA

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful for determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer, 2003; Scott et al., 2004).

BACKGROUND

GEOLOGICAL SETTING

This project is located within the Peninsular Range Geomorphic Province which extends from Mount San Jacinto in the north to Baja, California in the south and includes the Inland Empire, Los Angeles, Orange County, and San Diego areas of California. The Peninsular Ranges Geomorphic Province is located in the southwestern corner of California and is bounded by the Transverse Ranges Geomorphic Province to the north and the Colorado Desert Geomorphic Province to the east. This geomorphic province is characterized by elongated northwest-trending mountain ridges separated by sediment-floored valleys. Many faults to the

west of the Salton Trough section of the San Andreas Fault Zone, parallel this northwest-south east trending fault zone and have taken up some of the strain of the San Andreas. The Lake Elsinore Fault Zone is one such fault zone.

To the north of the project, the San Andreas Fault Zone travels up Cajon Pass where it is the boundary between the Pacific Plate and the North American Plate. The Transverse Ranges include the San Bernardino and San Gabriel mountains along with the paralleling ranges and result from these two plates grinding past each other and "catching" along the bend in the San Andreas. The project is located on the Pacific Plate which is composed of numerous blocks that can move independently (Wagner 2002).

STRATIGRAPHY

The project surface is mapped entirely as Holocene to late Pleistocene (less than 126,000 years old) axial channel deposits. Sediments consist of slightly to moderately indurated, alluvially deposited, silts to sands (Morton and Miller 2006).

PALEONTOLOGICAL RECORD SEARCHES

The records and literature search reviewed information from within five miles of the proposed project. San Bernardino County Museum record searches near to the project were consulted for local information (Scott 2006, 2007, 2014). Online databases including the Natural History Museum of Los Angeles County, Department of Invertebrate Paleontology (LACMIP 2017), the Paleobiology Database (PBDB 2017), and the University of California Museum of Paleontology Database (UCMP 2017) were also searched for localities near to the project. Print resources including published material (Hay 1927; Jefferson 1991a, 1991b, 2012 unpublished) and unpublished project reports (Gust and Wexelblatt 2012) were searched for fossil localities.

Results of the record search indicate that no previous fossil localities have been from late Pleistocene alluvial sediments within five miles of the proposed project. Within California valley areas, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep. Shallower sediments in the valleys usually do not contain the remains of extinct animals, although Holocene remains less than 11,700 years old may be present.

RECONNAISSANCE SURVEY

The survey stage is an important part of the project's environmental assessment phase. The purpose is to confirm that field observations conform to the geological maps of the project area. Sediments are assessed for their potential to contain fossils. Additionally, if there are known paleontological resources the survey will verify the exact location of those resources, the condition or integrity of each resource, and the proximity of the resource to the project area. All undeveloped ground surface areas within the ground disturbance portion of the project area are examined. Existing ground disturbances (e.g., cutbanks, ditches, animal burrows, etc.) are visually inspected. Photographs of the project area, including ground surface visibility and items of interest, are taken with a digital camera.

Megan Wilson performed a joint archaeological and paleontological field survey of the entire project area on May 24, 2017.

SURVEY RESULTS

Ground visibility was a maximum of 30% due overgrowth of weeds (Figure 3). Only the surface of the Holocene to late Pleistocene axial channel deposits could be observed as no culverts, washes, or other cuts were present. Surficial sediments consisted of minimally oxidized, light yellowish grey, silts and sands. Larger clasts consisted entirely of construction materials (concrete, pipe, pebbles, rock, etc.) and other trash (Figure 4). No fossils were encountered during the survey.

Figure 3. Onsite overgrowth

Figure 4. Surficial sediments with dumped pipe and rock

PALEONTOLOGICAL SENSITIVITY

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system (BLM, 2008; Appendix B) has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria

Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to 5 mm in diameter or less. Moreover, fossil preservation also greatly increases after natural burial in rivers, lakes, or oceans. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. So the sands, silts, and clays of rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

Based on other recorded localities, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep in California valleys. Shallower sediments in the valleys usually do not contain the remains of extinct animals, although Holocene (less than 11,700 years old) remains may be present. The Holocene to late Pleistocene axial channel deposits are ranked as low (PFYC 2) sensitivity at the surface and increasing to moderate and patchy sensitivity (PFYC 3a) at depths below 8 feet.

CONCLUSIONS AND RECOMMENDATIONS

The proposed maximum depth of cuts is six to seven feet below the current ground surface. Only Holocene to late Pleistocene axial channel deposits may be impacted by the proposed project construction activities. No late Pleistocene fossils were identified within five miles of the proposed project in sediments comparable to those within the study area. Based on other finds from California valley areas, late Pleistocene fossils typically begin appearing between 8 to 10 feet deep. On this basis, it is considered unlikely that fossils meeting significance criteria will be encountered on this project; therefore, no mitigation is recommended. If unanticipated discoveries of paleontological resources occur during construction, all work within 50 feet of the discovery should be halted until the find has been evaluated by a qualified paleontologist.

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APPENDIX A: QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

KIM SCOTT
Principal Investigator for Paleontology
Field & Lab Director for Paleontology

EDUCATION

2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles
2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino

SUMMARY QUALIFICATIONS

Scott has more than 20 years of experience in California paleontology and geology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Temecula Gateway EIR, Riverside County, CA. A Planned Development Overlay/Zone Change and General Plan Amendment. Prepared an assessment report for a 9-acre parcel for the EIR. Sub to PMC. Co-Principal Investigator/Report Co-author. 2015

Interstate 15 (I-15) / Limonite Avenue Interchange Improvement Project, Caltrans District 8, Eastvale, Riverside County, CA. The proposed project would replace the existing Limonite Avenue OC and would widen the roadway from four lanes to six lanes. Prepared a Paleontological Mitigation Plan. Sub to Dokken Engineering. Co-Principal Investigator/Report Co-author. 2015.

Perris Valley Line Project, Metrolink - Riverside County Transportation Commission, Riverside County, CA. The project was a 24-mile extension of the Metrolink 91 Line. Managed paleontological monitoring for construction of four new stations, upgrading associated track and utility relocations to extend the Metrolink connection from Riverside through Moreno Valley to Perris. Prepared an abbreviated Paleontological Assessment, supervised all field activities and prepared the Paleontological Resources Monitoring Compliance Report. Sub to HDR Engineering. Project Manager and Principal Paleontologist. 2013-2016.

SR 91 Widening Project, Caltrans District 8, Riverside, Riverside County, CA. Caltrans widening from the Interstate 60/ State Route 91/ State Route 215 interchange to the Adams Street bridge (Post mile marker 15.6 to 21.6). Construction activities included the addition of two High Occupancy Vehicle (HOV) lanes (one for either direction), interchange reconfiguration, overhead replacement, and undercrossing widening and pavement restriping within the Right of Way (ROW). Supervised paleontological monitoring, monitored, prepared fossils, and prepared the mitigation report. Under contract to Applied Earthworks. Field and Laboratory Supervisor/Report Co-author. 2011-2012.

Fogarty Substation, Southern California Edison, near Lake Elsinore, Riverside County, CA. Project consisted of construction of an Edison substation. Performed site visits, WEAP training, and reporting. Field Director. 2010.

El Casco Substation Project, Southern California Edison, Riverside County. Performed preconstruction mitigation measures and prepared portions of Paleontological Resources Treatment Plan. Field and Lab Director and Report co-author. 2009

APPENDIX B: SENSITIVITY RANKING CRITERIA

PFYC Rank	PFYC Description (BLM, 2007)
1	Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.
2	Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.
3b	Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.
3a	Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.
4	High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.
5	Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.

As per BLM (2008).

Appendix E

Geotechnical Investigation Report

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE

Lake Elsinore, California

Prepared for:
MR. RON KASSAB

Prepared by:
GEOBODEN INC.
Irvine, CA 92620

December 30, 2017

Project No. Lake Elsinore-1-01

GEOBODEN INC.

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

MR. RON KASSAB

Prepared by:

GEOBODEN INC.
5 Hodgenville, Suite A.
Irvine, California 92620

December 30, 2017

JOB NO. Lake Elsinore-1-01

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017 Project No. Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: Geotechnical Investigation Report
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

GeoBoden, Inc. (GeoBoden) is pleased to submit herewith our geotechnical investigation report for the Proposed Kassab Travel Center to be constructed at 29301 Riverside Drive in the city of Lake Elsinore, California.

This report presents the results of our field investigation, laboratory testing and our engineering judgment, opinions, conclusions and recommendations pertaining to geotechnical design aspects of the proposed development.

It has been a pleasure to be of service to you on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please do not hesitate to contact us.

Respectfully submitted,
GEOBODEN, INC.

Cyrus Radvar,
Principal Engineer, G.E. 2742

Copies: 4/Addressee

GEOTECHNICAL INVESTIGATION REPORT

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

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Figure 1 Vicinity Map
Figure 2 Boring Location Plan

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Appendix A Boring Logs
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GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
Lake Elsinore, California

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by GeoBoden, Inc. (GeoBoden) for the Proposed Kassab Travel Center to be located at 29301 Riverside Drive in Lake Elsinore, California. The general location of the project is shown on Figure 1.

The purposes of this investigation were to determine the geotechnical properties of subsurface soil conditions, to evaluate their in-place characteristics, evaluate site seismicity, and to provide geotechnical recommendations with respect to site grading and for design and construction of proposed foundations and other site improvements.

The scope of the authorized investigation included performing a site reconnaissance, conducting field exploration and laboratory testing programs, performing engineering analyses, and preparing this Geotechnical Investigation Report. Evaluation of environmental issues or the potential presence of hazardous materials was not within the scope of services provided.

This report has been prepared for RON KASSAB and their other project team members, to be used solely in the development of facilities described herein. This report may not contain sufficient information for other uses or the purposes of other parties.

2.0 SITE LOCATION AND PROJECT DESCRIPTION

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The site is bounded by Collier Avenue on the east, by an existing building on the north, by a vacant land on the west, and by Riverside Drive on the south. The subject property is presently occupied by a vacant land.

The maximum column load for the new building will be about 75 kips, and the line load will be about 3 kips per lineal feet. Currently, it is our understanding that the proposed building will consist of masonry construction with slab on-grade.

3.0 GEOTECHNICAL INVESTIGATION

Our geotechnical investigation included a field exploration program and a laboratory testing programs. These programs were performed in accordance with our scope of services. The field exploration and laboratory testing programs are briefly described below. A more detailed description of the field exploration and laboratory testing programs is provided in Appendix A and Appendix B, respectively.

3.1 FIELD EXPLORATION PROGRAM

The field exploration program was initiated on December 18, 2017 under the supervision of an engineer. Eight (8) exploratory borings were drilled using a truck-mounted drilling rig equipped with 8-inch diameter hollow stem augers. The borings were advanced to depths of ranging from 11.5 to 31.5 feet (below ground surface). The approximate locations of exploratory borings are shown on Figure 2.

Logs of subsurface conditions encountered in the borings were prepared in the field by a representative of our firm. Soil samples consisting of relatively undisturbed brass ring samples and Standard Penetration Tests (SPT) samples were collected at approximately 5-foot depth intervals and were returned to the laboratory for testing. The SPTs were performed in accordance with ASTM D 1586. Final boring logs were prepared from the field logs and are presented in Appendix A.

3.2 LABORATORY TESTING

Selected samples collected during drilling activities were tested in the laboratory to assist in evaluating controlling engineering properties of subsurface materials at the site. Physical tests performed included moisture and density determination, consolidation, expansion index, No. 200 Sieve, Atterberg limits, and corrosion. The results of laboratory are presented in Appendix B.

4.0 DISCUSSION OF FINDINGS

The following discussion of findings for the site is based on the results of the field exploration and laboratory testing programs.

4.1 SITE AND SUBSURFACE CONDITIONS

Observed subsurface native soils consisted of sandy clay, clay, clay with sand, sand and sand with silt to the maximum explored depth of 31.5 feet below ground surface (bgs).

Based on blow counts recorded during sampling, the clayey soils encountered within borings were found to be firm to stiff. The sandy soil was found to be medium dense. For a more detailed description of the subsurface materials refer to the boring logs included in Appendix A of this report.

4.2 GROUNDWATER CONDITIONS

Groundwater was encountered within our exploratory boring B-1 through B-5 at 15 feet bgs. Based on information from the nearby wells (http://www.water.ca.gov/waterdatalibrary/), the historic high ground water level in the site vicinity is at a depth of greater than 50 feet beneath the existing ground surface.

Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

4.3 SOIL ENGINEERING PROPERTIES

Physical tests were performed on the relatively undisturbed samples to characterize the engineering properties of the native soils. Moisture content determination was performed on the samples to evaluate the in-situ moisture content. Moisture content and dry unit weight results are included in Appendix B.

4.4 CONSOLIDATION CHARACTERISTICS

Consolidation tests were performed on samples of the existing fill and native overburden soils recovered from the boring. Results of the consolidation tests indicate that the overburden material will have moderate compressibility under the anticipated loads. These characteristics are compatible with the allowable bearing capacity values and corresponding settlement estimates presented in Foundations Section of our report.

4.5 COLLAPSE POTENTIALS

Results of consolidation tests on samples of native soil indicate that the native soils will have low collapse potential. Removal and recompaction of the surficial soils is expected to reduce the anticipated amount of total differential settlement within the site.

4.6 EXPANSIVE SOILS

Preliminary laboratory testing of representative sample of onsite soils indicate that these materials exhibit LOW expansion potential. We anticipate that the design and performance of the proposed new building will not be affected by expansion of onsite soils.

5.0 STRONG GROUND MOTION POTENTIAL

The project site is located in a seismically active area typical of Southern California and likely to be subjected to a strong ground shaking due to earthquakes on nearby faults.

The Elsinore (Glen Ivy) rev fault is the closest known active fault, located 1.91-km of the site with an anticipated maximum moment magnitude (M_w) of 7.7.

5.1 CBC DESIGN PARAMETERS

To accommodate effects of ground shaking produced by regional seismic events, seismic design can, at the discretion of the designing Structural Engineer, be performed in accordance with the 2016 edition of the California Building Code (CBC). Table below, 2016 CBC Seismic Parameters, lists (next) seismic design parameters based on the 2016 CBC methodology, which is based on ASCE/SEI 7-10:

2016 CBC Seismic Design Parameters	Value
Site Latitude (decimal degrees)	33.6947
Site Longitude (decimal degrees)	-117.3471
Site Class Definition (ASCE 7 Table 20.3-1)	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Figure 1613.3.1(1))	2.293
Mapped Spectral Response Acceleration at 1s Period, S_1 (Figure 1613.3.1(2))	0.915
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613.3.3(1))	1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613.3.3(2))	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16-37)	2.293
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16-38)	1.372
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16-39)	1.528
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16-40)	0.915

6.0 LIQUEFACTION POTENTIAL

For liquefaction to occur, all of three key ingredients are required: liquefaction-susceptible soils, groundwater within a depth of 50 feet or less, and strong earthquake shaking. Soils susceptible to liquefaction are generally saturated loose to medium dense sands and non-plastic silt deposits below the water table.

Groundwater was encountered within our borings B-1 through B-5 at 15 feet. Historic high groundwater at the site is as deep as 50 feet. Soil materials encountered within our borings are clayey soil. It is our opinion that potential for liquefaction at the site is low.

7.0 DESIGN RECOMMENDATIONS

Based upon the results of our investigation, the proposed development is considered geotechnically feasible provided the recommendations presented herein are incorporated into the design and construction. If changes in the design of the structure are made or variations or changed conditions are encountered during construction, GeoBoden should be contacted to evaluate their effects on these recommendations. The following geotechnical engineering recommendations for the proposed buildings are based on observations from the field investigation program and the physical test results.

7.1 EARTHWORK

All earthworks, including excavation, backfill and preparation of subgrade, should be performed in accordance with the geotechnical recommendations presented in this report and applicable portions of the grading code of local regulatory agencies. All earthwork should be performed under the observation and testing of a qualified geotechnical engineer.

7.2 SITE AND FOUNDATION PREPARATION

All site preparation should be observed by experienced personnel reporting to the project Geotechnical Engineer. Our field monitoring services are an essential continuation of our prior studies to confirm and correlate the findings and our prior recommendations with the actual subsurface conditions exposed during construction, and to confirm that suitable fill soils are placed and properly compacted.

Clearing operations should include the removal of all surface vegetation. Large shrubs, when removed, should be grubbed out to include their stumps and major root systems.

In general, all fill soils within the proposed building footprints should be overexcavated and replaced with engineered fill. As a minimum, removals should extend to competent native soils. At least 3 feet of compacted fill should be provided underneath all spread footings and floor slabs. The compacted fill should extend laterally a minimum of 5 feet beyond the foundation footprints, where possible. All existing low-density, near-surface soils will require removal to competent material from areas to receive newly compacted fill. The basis for establishing a competent exposed surface on which to place fill should consist of competent materials exhibiting an in-place relative compaction of at least 85 percent. Prior to placing structural fill, exposed bottom surfaces in each removal area approved for fill should first be scarified to a depth of at least 6 inches, water or air dried as necessary to achieve 3 percent above optimum moisture conditions, and then recompacted in place to a minimum relative compaction of 90 percent.

Based on the observations made in our borings and the results of pertinent laboratory tests, anticipated depths of removal of unsuitable soils will range from 4 to 5 feet. However, actual removal depths will have to be determined during grading on the basis of in-grading observations and testing performed by a representative of geotechnical consultants.

To provide support for foundations for minor structures and for at-grade concrete walks and slabs, all existing fill and disturbed natural soils should be excavated and replaced with properly compacted fill. Any required fill should be properly compacted as specified below.

At least the upper six (6) inches of all excavated surfaces should be scarified and moisture conditioned to 3 percent above optimum moisture, if necessary, and compacted to at least 90 percent relative compaction as per ASTM Standard D1557 test method, prior to placing any fill and/or structures.

7.3 FILL PLACEMENT AND COMPACTION REQUIREMENTS

Material for engineered fill should be select free of organic material, debris, and other deleterious substances, and should not contain fragments greater than 3 inches in maximum dimension. On-site excavated soils that meet these requirements may be used to backfill the excavated building pad area.

All fill should be placed in 6-inch-thick maximum lifts, watered or air dried as necessary to 3 percent above optimum moisture content, and then compacted in place to a maximum relative compaction of 90 percent. The laboratory maximum dry density and optimum moisture content for each change in soil type should be determined in accordance with Test Method ASTM D 1557. A representative of the project consultant should be present on-site during grading operations to verify proper placement and compaction of all fill, as well as to verify compliance with the other geotechnical recommendations presented herein.

Imported soils, if any, should consist of clean materials exhibiting a VERY LOW expansion potential (Expansion Index less than 20). Soils to be imported should be approved by the project geotechnical consultant prior to importation.

7.4 GEOTECHNICAL OBSERVATIONS

Exposed bottom surfaces in each removal area should be observed and approved by the project geotechnical consultant prior to placing fill. No fill should be placed without prior approval from the geotechnical consultant.

The project geotechnical consultant should be present on site during grading operations to verify proper placement and compaction of fill, as well as to verify compliance with the recommendations presented herein.

7.5 UTILITY TRENCH BACKFIL

All utility trench backfill should be compacted to a minimum relative compaction of 90 percent. Trench backfill materials should be placed in lifts no greater than approximately 6 inches in thickness, watered or air-dried as necessary to 3 percent above optimum moisture content, and then mechanically compacted in place to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should probe and test the backfills to verify adequate compaction.

As an alternative for shallow trenches where pipe or utility lines may be damaged by mechanical compaction equipment, such as under floor slabs, imported clean sand exhibiting a sand equivalent (SE) value of 30 or greater may be utilized. The sand backfill materials should be watered to achieve 3 percent above optimum moisture conditions and then tamped into place. No specific relative compaction will be required; however, observation, probing, and if deemed necessary, testing should be performed by a representative of the project geotechnical consultant to verify an adequate degree of compaction and that the backfill will not be subject to settlement.

Where utility trenches enter the footprint of the floor slabs, they should be backfilled through their entire depths with on-site fill materials, sand-cement slurry, or concrete rather than with any sand or gravel shading. This "Plug" of less- or non-permeable materials will mitigate the potential for water to migrate through the backfilled trenches from outside to the areas beneath the foundations and floor slabs.

7.6 SHALLOW FOUNDATIONS

Following the site and foundation preparation recommended above, foundation for load bearing walls and interior columns may be designed as discussed below.

7.6.1 Bearing Capacity and Settlement

Load bearing walls and interior columns may be supported on continuous spread footings and isolated spread footings, respectively, and should bear entirely upon undisturbed native or properly engineered fill. Continuous and isolated footings should have a minimum width of 18 inches and 24 inches, respectively. All footings should be embedded a minimum depth of 24 inches measured from the lowest adjacent finish grade. Continuous and isolated footings placed on such materials may be designed using an allowable (net) bearing capacity of 1,800 pounds per square foot (psf) respectively. Allowable increases of 200 psf for each additional 1 foot in width and 200 psf for each additional 6 inches in depth may be utilized, if desired. The maximum allowable bearing pressure should be 2,500 psf. The maximum bearing value applies to combined dead and sustained live loads. The allowable bearing pressure may be increased by one-third when considering transient live loads, including seismic and wind forces.

Based on the allowable bearing value recommended above, total settlement of the shallow footings are anticipated to be less than one inch, provided foundation preparations conform to the recommendations described in this report. Differential settlement is anticipated to be approximately half the total settlement for similarly loaded footings spaced up to approximately 30 feet apart.

7.6.2 Lateral Load Resistance

Lateral load resistance for the spread footings will be developed by passive soil pressure against sides of footings below grade and by friction acting at the base of the concrete footings bearing on compacted fill. An allowable passive pressure of 200 psf per foot of depth may be used for design purposes. An allowable coefficient of friction 0.30 may be used for dead and sustained live load forces to compute the frictional resistance of the footings constructed directly on compacted fill. Safety factors of 2.0 and 1.5 have been incorporated in development of allowable passive and frictional resistance values, respectively. Under seismic and wind loading conditions, the passive pressure and frictional resistance may be increased by one-third.

7.6.3 Footing Reinforcement

Reinforcement for footings should be designed by the structural engineer based on the anticipated loading conditions. Footings for structures that are supported in low expansive soils should have No. 4 bars, two top and two bottom.

7.7 CONCRETE SLAB ON-GRADE

Concrete slabs will be placed on undisturbed natural soils or properly compacted fill as outlined in Section 7.2. Moisture content of subgrade soils should be maintained 3 percent above the optimum moisture content.

At the time of the concrete pour, subgrade soils should be firm and relatively unyielding. Any disturbed soils should be excavated and then replaced and compacted to a minimum of 90 percent relative compaction. Slabs should be designed to accommodate low expansive fill soils. The structural engineer should determine the minimum slab thickness and reinforcing depending upon the expansive soil condition intended use. Slabs placed on low expansive soils should be at least 4 inches thick and have minimum reinforcement of No. 3 bars placed at mid-height of the slabs and spaced 18 inches on centers, in both directions. The structural engineer may require thicker slabs with more reinforcement depending on the anticipated slab loading conditions.

If moisture-sensitive floor covering is planned, a layer of open-graded gravel, at least 4 inches thick, should be placed below the concrete slab to form a capillary break. Alternately, moisture-proof membrane (such as 10-mil) may be utilized. The vapor barrier should be placed between sand layers (2 inches above and below) to protect the membrane from damage during construction. Gravel for use under a concrete floor slab should be clean, crushed rock that meets the gradation requirements presented below.

Sieve Size	Percentage
1 inch	100
¾ inch	90-100

No. 4 0-10

7.8 PRELIMINARY PAVEMENT DESIGN

Pavement design should be confirmed at the completion of site grading when the subgrade soils are in-place. This should include sampling and R-Value testing of the actual subgrade soils and an analysis based upon the anticipated traffic loading.

For a preliminary pavement design, recommendations for pavement design section of asphalt parking areas are provided below. These values are based on an assumed R-value of 25.

For pavement design, Traffic indexes (TI) of 4.0 and 5.5 were used for the parking areas and auto driveways, respectively. The preliminary flexible pavement layer thickness is as follows:

RECOMMMENDED ASPHALT PAVEMENT SECTION LAYER THICKNESS

Pavement Material	Recommended Thickness	
	TI = 4.0	TI = 5.5
Asphalt Concrete Surface Course	3 inches	4 inches
Class II Aggregate Base Course	6 inches	8 inches
Compacted Subgrade Soils	12 inches	12 inches

Asphalt concrete should conform to Sections 203 and 302 of the latest edition of the Standard Specifications for Public Works Construction ("Greenbook").

Class II aggregate base should conform to Section 26 of the Caltrans Standard Specifications, latest edition. The aggregate base course should be compacted to at least 95 percent of the maximum dry density as determined by ASTM Method D 1557.

Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for three Traffic Indices are presented below. We have assumed that the portland cement concrete will have a compressive strength of at least 3,000 pounds per square inch.

Assumed Traffic Index	PCC Paving (Inches)	Base Course (Inches)
4½ (Automobile Parking)	7	4
5½ (Driveways and Light Track Traffic)	7½	4
6½ (Roadways and Heavy Truck Traffic)	8	4

7.9 SOLUBLE SULFATES AND SOIL CORROSIVITY

Concrete subject to exposure to sulfates shall comply with the requirements set forth in ACI 318, Section 4.3. Based on the available water soluble sulfate results the corrosion potential to buried concrete should be considered "low", i.e., exposure Class S_0, per ACI 318, Table 4.2.1. Consequently, injurious sulfate attack is not a concern with a minimum 28-day compressive strength of 2,500 psi.

Per CBC 2016, Section 1904.4, concrete reinforcement should be protected from corrosion and exposure to chlorides in accordance with ACI 318, Section 4.4.

The corrosion potential of the on-site materials to buried steel was evaluated in accordance with Caltrans corrosive environment evaluation criteria. Caltrans considers a site corrosive, if at least one of the following conditions exists:

- Chloride content ≥ 500 ppm;
- Soluble sulphate content ≥ 2,000 ppm;
- pH ≤ 5.5.

Observations and laboratory tests indicate that based on the Caltrans' criteria the soils at the site are considered non-corrosive. If additional recommendations are desired, it is recommended that a corrosion specialist be consulted regarding suitable types of piping and necessary protection for underground metal conduits.

8.0 CONSTRUCTION CONSIDERATIONS

Based on our field exploration program, earthwork can be performed with conventional construction equipment.

8.1 TEMPORARY DEWATERING

Groundwater was encountered within our borings at 15 feet below ground surface. Based on the anticipated excavation depths, the need for temporary dewatering is considered low.

8.2 CONSTRUCTION SLOPES

Excavations during construction should be conducted so that slope failure and excessive ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsoils, height of the excavation and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall and desiccation.

Where space permits, and providing that adjacent facilities are adequately supported, open excavations may be considered. In general, unsupported slopes for temporary construction excavations should not be expected to stand at an inclination steeper than 1:1 (horizontal:vertical). The temporary excavation side walls may be cut vertically to a height of 3 feet and then laid back at a 1:1 slope ratio above a height of 3 feet.

Surcharge loads should be kept away from the top of temporary excavations a horizontal distance equal to at least one-half the depth of excavation. Surface drainage should be controlled along the top of temporary excavations to preclude wetting of the soils and erosion of the excavation faces. Even with the implementation of the above recommendations, sloughing of the surface of the temporary excavations may still occur, and workmen should be adequately protected from such sloughing.

If site conditions do not provide sufficient space for sloped excavations at the project site, slot cutting techniques in a repeating "ABC" sequence may be required. First, all the slots designated as "A" should be excavated, backfilled and recompacted. The procedure should continue with the "B" slots and end with the "C" slots. The width of each slot should not exceed 6 feet. If any evidence of potential instability is observed, revised recommendations such as narrower slot cuts may be necessary. All slot excavation and backfilling procedures should be performed under the observation and testing of a qualified geotechnical engineer.

9.0 POST INVESTIGATION SERVICES

Final project plans and specifications should be reviewed prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. Following review of plans and specifications, observation should be performed by the geotechnical engineer during construction to document that foundation elements are founded on/or penetrate onto the recommended soils, and that suitable backfill soils are placed upon competent materials and properly compacted at the recommended moisture content.

10.0 CLOSURE

The conclusions, recommendations, and opinions presented herein are: (1) based upon our evaluation and interpretation of the limited data obtained from our field and laboratory programs; (2) based upon an interpolation of soil conditions between and beyond the borings; (3) are subject to confirmation of the actual conditions encountered during construction; and, (4) are based upon the assumption that sufficient observation and testing will be provided during construction.

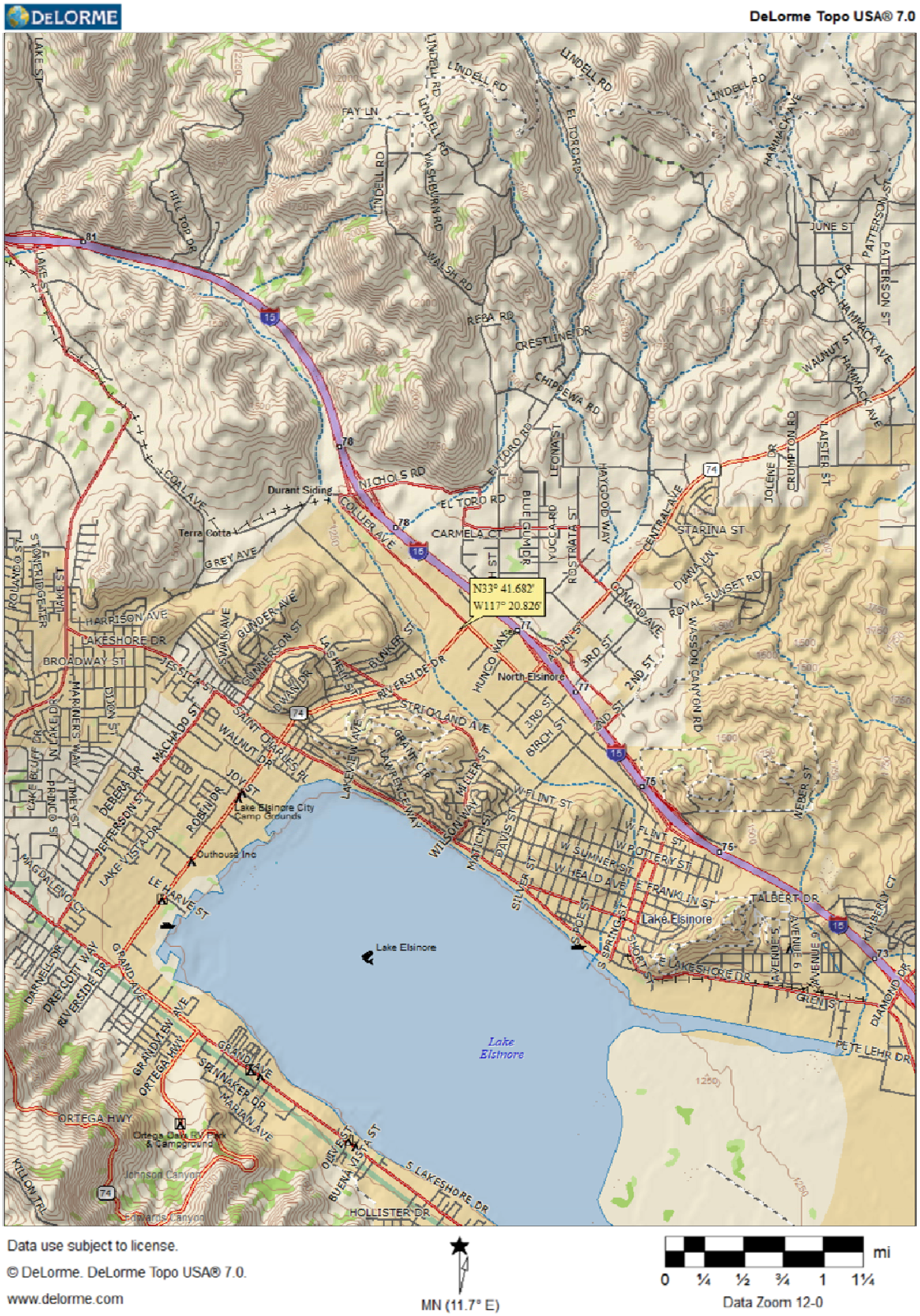
If parties other than GeoBoden are engaged to provide construction geotechnical services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the findings and recommendations in this report or providing alternate recommendations.

If pertinent changes are made in the project plans or conditions are encountered during construction that appear to be different than indicated by this report, please contact this office. Significant variations may necessitate a re-evaluation of the recommendations presented in this report.

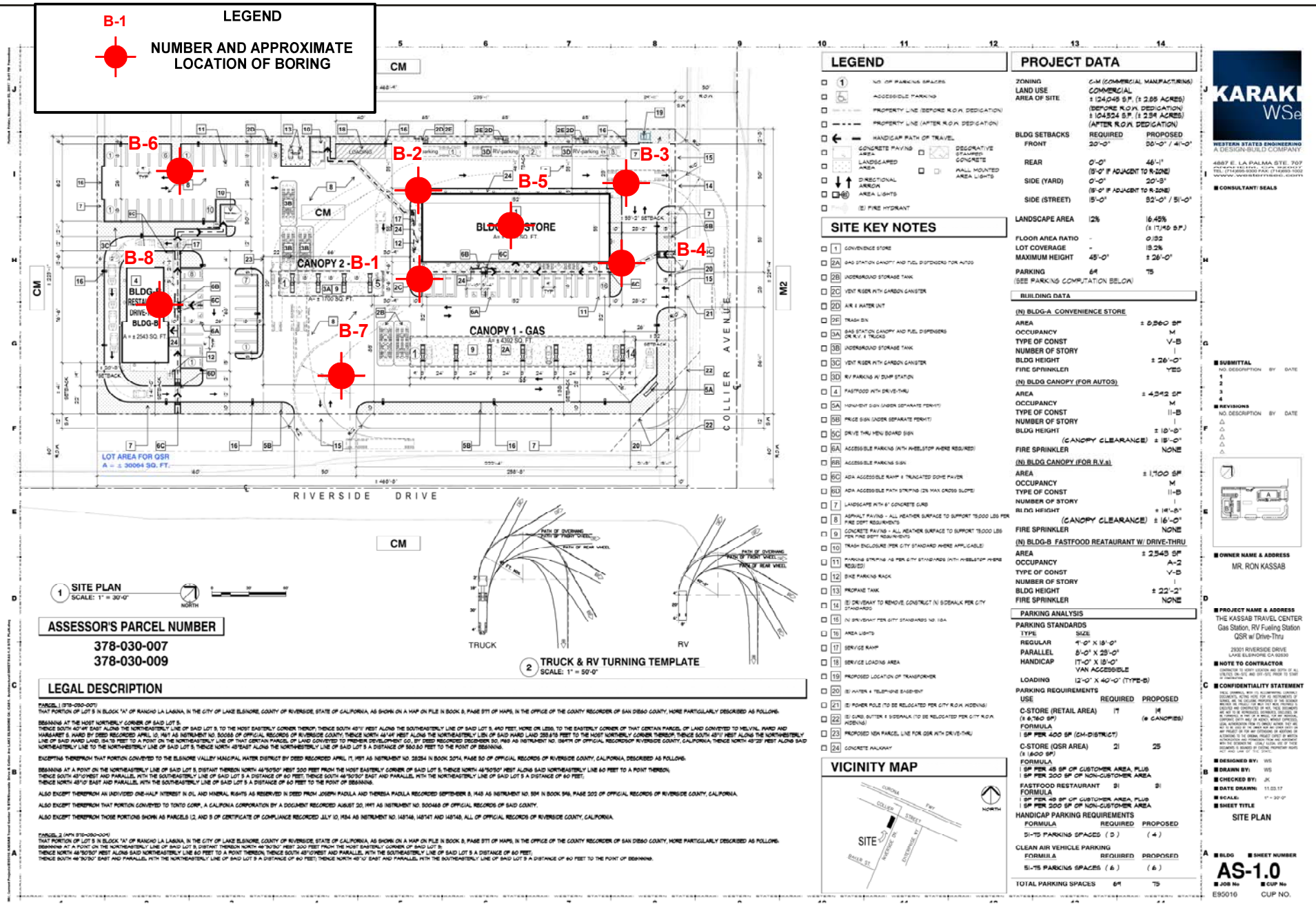
11.0 REFERENCES

California Building Code, 2016 Volume 2.

FIGURES



GEOBODEN INC. Geotechnical Consultants	**SITE VICINITY MAP** **Proposed Kassab Travel Center** **29301 Riverside Drive** **Lake Elsinore, California**	Figure By S.R.	Project No. Lake Elsinore
		Map No. XX	Figure No. 1
		Date 12-30-17	



LEGAL DESCRIPTION

PARCEL 1 (378-030-007)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 5;
THENCE SOUTH 40°48' EAST ALONG THE NORTHEASTERLY LINE OF SAID LOT 5, TO THE MOST EASTERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE SOUTHEASTERLY LINE OF SAID LOT 5, 440 FEET, MORE OR LESS, TO THE EASTERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO MELVIN L. WARD AND MARGARET S. WARD BY DEED RECORDED APRIL 10, 1961 AS INSTRUMENT NO. 50066 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY; THENCE NORTH 46°48' WEST ALONG THE NORTHEASTERLY LINE OF SAID WARD LAND, 259.615 FEET TO THE MOST NORTHERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE NORTHWESTERLY LINE OF SAID WARD LAND, 264.75 FEET TO A POINT ON THE NORTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND CONVEYED TO PREMIER DEVELOPMENT CO., BY DEED RECORDED DECEMBER 30, 1960 AS INSTRUMENT NO. 138478 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA; THENCE NORTH 40°29' WEST ALONG SAID NORTHEASTERLY LINE TO THE NORTHWESTERLY LINE OF SAID LOT 5; THENCE NORTH 49°EAST ALONG THE NORTHWESTERLY LINE OF SAID LOT 5 A DISTANCE OF 560.50 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT BY DEED RECORDED APRIL 17, 1957 AS INSTRUMENT NO. 28294 IN BOOK 2074, PAGE 50 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 46°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5; THENCE NORTH 46°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON;
THENCE SOUTH 43°10'WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE SOUTH 46°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE NORTH 43°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN OIL AND MINERAL RIGHTS AS RESERVED IN DEED FROM JOSEPH PADILLA AND THERESA PADILLA RECORDED SEPTEMBER 8, 1948 AS INSTRUMENT NO. 504 IN BOOK 946, PAGE 202 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO TONTO CORP., A CALIFONIA CORPORATION BY A DOCUMENT RECORDED AUGUST 20, 1991 AS INSTRUMENT NO. 300468 OF OFFICIAL RECORDS OF SAID COUNTY.

ALSO EXCEPT THEREFROM THOSE PORTIONS SHOWN AS PARCELS 1,2, AND 3 OF CERTIFICATE OF COMPLIANCE RECORDED JULY 10, 1984 AS INSTRUMENT NO. 148148, 148147 AND 148149, ALL OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (APN 378-030-004)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 46°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5;
THENCE NORTH 46°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON; THENCE SOUTH 43°10'WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE SOUTH 46°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE NORTH 43°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

GEOBODEN INC. Geotechnical Consultants	BORING LOCATION PLAN Proposed Kassab Travel Center 29301 Riverside Drive Lake Elsinore, California	Figure By S.R.	Project No. Lake Elsinore
		Map No. XX	Figure No. 2
		Date 12-30-17	

APPENDIX A
BORING LOGS

APPENDIX A
SUBSURFACE EXPLORATION PROGRAM

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Prior to drilling, the proposed borings were located in the field by measuring from existing site features.

A total of 8 exploratory borings (B-1 through B-8) were drilled using a hollow-stem auger drill rig equipped with 8-inch outside diameter (O.D.) augers and hand-auger equipment. GeoBoden, Inc. of Irvine, California performed the drilling on December 18, 2017. The borings locations are shown on Figure 2.

Depth-discrete soil samples were collected at selected intervals from the exploratory borings using a 2 ½ -inch inside diameter (I.D.) modified California Split-barrel sampler fitted with 12 brass ring of 2 ½ inches in O.D. and 1-inch in height and one brass liner (2 ½ -inch O.D. by 6 inches long) above the brass rings. The sampler was lowered to the bottom of the boreholes and driven 18 inches into the soil with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the lower 12 inches is shown on the blow count column of the boring logs.

After removing the sampler from the boreholes, the sampler was opened and the brass rings and liner containing the soil were removed and observed for soil classification. Brass rings containing the soil were sealed in plastic canisters to preserve the natural moisture content of the soil. Soil samples collected from exploratory borings were labeled, and were transported for physical testing.

Standard Penetration Tests (SPTs) were also performed. The SPT consists of driving a standard sampler, as described in the ASTM 1586 Standard Method, using a 140-pound hammer falling 30 inches. The number of blows required to drive the SPT sampler the lower 12 inches of the sampling interval is recorded on the blow count column of the boring logs.

The soil classifications and descriptions on field logs were performed using the Unified Soil Classification System as described by the American Society for Testing and Materials (ASTM) D 2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." The final boring logs were prepared from the field logs and are presented in this Appendix.

At the completion of the sampling and logging, the exploratory borings were backfilled with the drilled cuttings.

GEOBODEN, INC.

BORING NUMBER B-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12		97	24	49	18	31	69
10		SANDY CLAY (CL): strong brown, moist, ~30% fine sand, ~70% fines	SS S-2		14			28				70
15		▽ light brown, wet	MC R-3		12							
20			SS S-4		14							
25		brown, wet	SS S-5		12							
30		SAND (SP): yellowish brown, wet, coarse sand	SS S-6		16							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION ___ **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY** ___
AT END OF DRILLING ---
NOTES ___
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, fine sand										
5			MC R-1		16		99	25				
10			SS S-2		11							
15		SANDY CLAY (CL): yellowish brown, moist, ~30% fine sand, ~70% fines ▽	MC R-3		12							
20		SAND (SP): light yellowish brown, wet, coarse sand	SS S-4		15							
25		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines	SS S-5		21							
30			SS S-6		26							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		13		100	26				
10			SS S-2		16							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
15		▽	MC R-3		19							
20			SS S-4		14							
25		wet	SS S-5		12							
		SAND w. SILT (SP-SM): yellowish brown, wet										
30			SS S-6		16							
		Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-4

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		CLAY (CL): grayish brown, moist										
5			MC R-1		19		103	27				
		CLAY w. SAND (CL): yellowish brown, moist, ~20% fine sand, ~80% fines [NATIVE]										
10			SS S-2		26							
15		▽	MC R-3		36							
20			SS S-4		29							
		Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-5

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		14		104	27				
10		CLAY (CL): brown, moist, ~10% fine sand, ~90% fines	SS S-2		11							
15	▽		MC R-3		14							
20			SS S-4		18							

Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-6

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		11		103	26				
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		14							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-7

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		16							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-8

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		16							
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		18							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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APPENDIX B
LABORATORY TESTING

APPENDIX B
LABORATORY TESTING
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Laboratory tests were performed on selected samples to assess the engineering properties and physical characteristics of soils at the site. The following tests were performed:

- moisture content and dry density
- No. 200 Wash sieve
- Atterberg limits
- consolidation
- expansion potential
- corrosion

Test results are summarized on laboratory data sheets or presented in tabular form in this appendix.

Moisture Density Tests

The field moisture contents, as a percentage of the dry weight of the soils, were determined by weighing samples before and after oven drying. The dry density, in pounds per cubic foot, was also determined fir all relatively undisturbed ring samples collected. These analyses were performed in accordance with ASTM D 2937. The results of these determinations are shown on the boring logs in Appendix A.

No. 200 Wash Sieve

A quantitative determination of the percentage of soil finer than 0.075 mm was performed on a selected soil sample by washing the soil through the No. 200 sieve. Test procedures were performed in accordance with ASTM Method D1140. The results of the tests are shown on the boring logs.

Atterberg Limits

Liquid limit, plastic limit, and plasticity index were determined for selected soil sample in accordance with ASTM D 4318. The soil sample was air-dried and passed through a No. 40 sieve and moisturized. The liquid and plastic limit tests were performed on the fraction passing the No. 40 sieve. Results of the Atterberg limits tests are shown graphically and presented in this Appendix.

Consolidation

The test was performed in accordance with ASTM Test method D 2345. The compression curve from the consolidation test is presented in this Appendix.

Expansion Potential

Expansion index test was performed on a representative sample of the on-site soils in accordance with ASTM D4829. The result of the expansion test is summarized in Table B-1.

TABLE B-1 (Expansion Index Test Data)

Boring Designation	**Depth (ft)**	Expansion Index (EI)
B-1	0-5	22

Corrosion Potential

A selected soil sample was tested to determine the corrosivity of the site soil to steel and concrete. The soil sample was tested for soluble sulfate (Caltrans 417), soluble chloride (Caltrans 422), and pH and minimum resistivity (Caltrans 643). The results of corrosion tests are summarized in Table B-2.

TABLE B-2 (Corrosion Test Results)

Boring No.	**Depth (ft)**	**Chloride Content (Calif. 422) ppm**	**Sulfate Content (Calif. 417) % by Weight**	**pH (Calif. 643)**	**Resistivity (Calif. 643) Ohm*cm**
B-1	0-5	89	0.0178	7.6	1,058

GEOBODEN, INC.

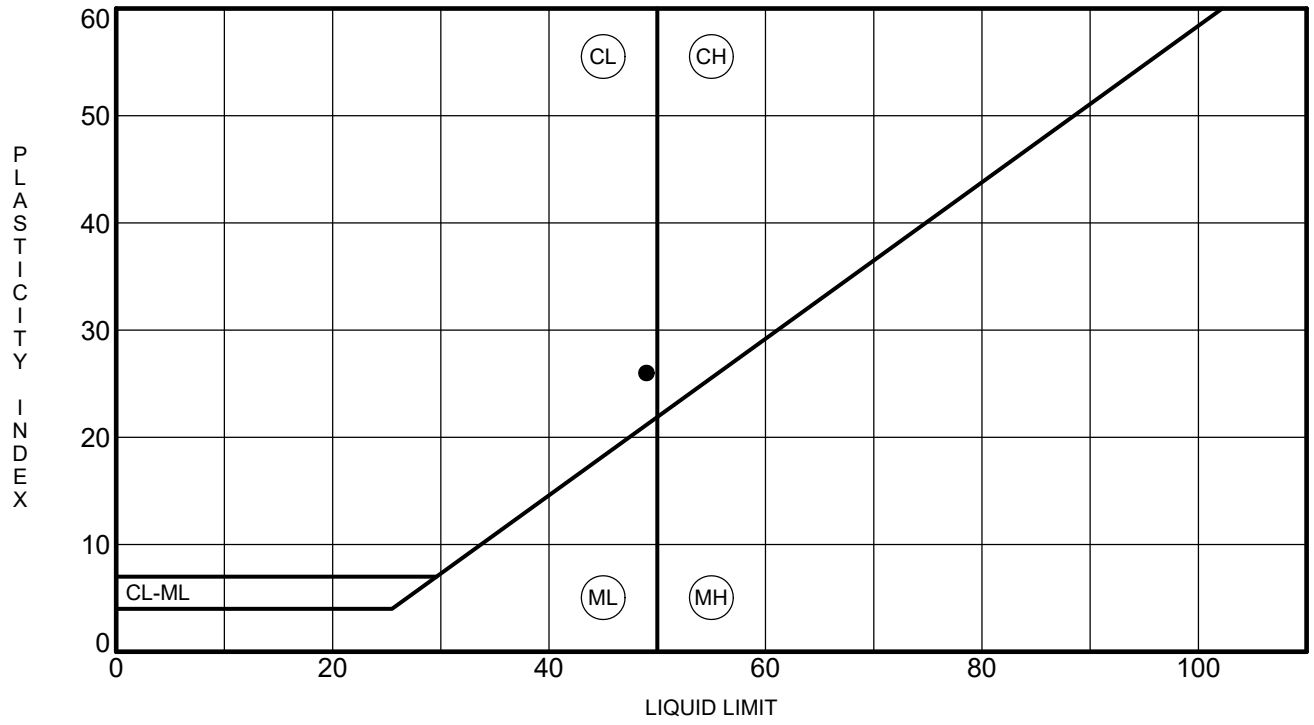
ATTERBERG LIMITS' RESULTS

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**B-1**	**5.0**	**49**	**23**	**26**	**69**	**SANDY LEAN CLAY(CL)**

ATTERBERG LIMITS - GINT STD US LAB.GDT - 12/30/17 11:40 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

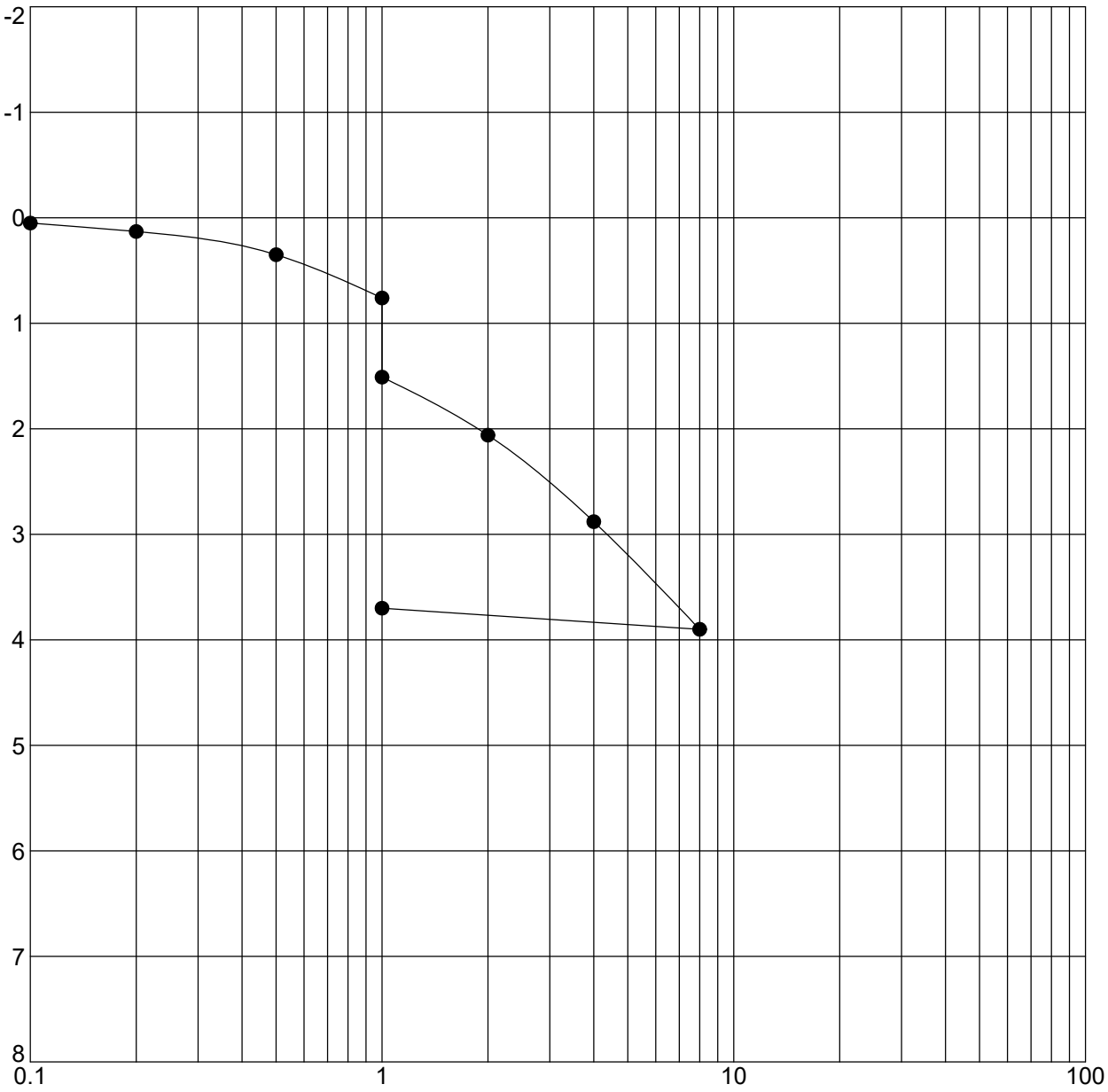
CONSOLIDATION TEST

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



Specimen Identification		Classification	γ_d	MC%
● B-1 5.0		**SANDY LEAN CLAY(CL)**	**97**	**24**

CONSOL STRAIN - GINT STD US LAB.GDT - 12/30/17 11:41 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

Appendix F

Infiltration/Percolation Testing for Stormwater Retention

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017
Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: **Infiltration/Percolation Testing for Stormwater Retention**
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

As requested, we have performed percolation/infiltration testing on the subject site in order to determine the infiltration potential of the surface soils. The percolation rates determined should be useful in assessing stormwater retention needs. It is our understanding that on-site stormwater retention will be required. It is proposed to collect the stormwater runoff within subsurface percolation chambers. This report presents the results of our study, discussion of our findings, and provides percolation rates for the subject system.

PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to determine the general percolation rates and physical characteristics of the onsite soils in order to provide design parameters for the proposed onsite infiltration system. Services provided for this study are in accordance with our agreement and consisted of the following:

- Site exploration consisting of the excavation and logging of three test holes;
- Percolation testing in the test holes (P-1, P-2 and P-3);
- Compilation of this report, which presents the results of our study and provides percolation rates for the design of an onsite infiltration system.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The subject property is presently occupied by a vacant land. The project consists of construction of Gas Station, RV Fueling Station and associated improvements. Further information regarding proposed development and test hole locations is shown on Figure 1, Percolation Test Holes Location Map.

FIELD INVESTIGATION

Our field investigation consisted of excavating three shallow exploratory test holes, which were also used as percolation test holes. Hollow-stem drilled equipment was utilized to excavate the exploratory test holes. An engineer logged and observed the test holes excavations. Soil classification was based on visual observation. The approximate locations of the exploratory and

percolation test holes are shown on Figure 1 (Percolation Test Holes Location Map). Logs of the exploratory test holes are presented in Appendix A.

SUBSURFACE SOILS CONDITIONS

SOIL PROFILE

The soils encountered within our test holes consisted of native soil materials. Native soils encountered within the exploratory test holes consisted primarily of sandy clay and clay. A more detailed description of these materials is provided in the exploratory test holes logs included in the enclosed Appendix A. Soils encountered were classified according to the Unified Soil Classification System (USCS).

GROUNDWATER

Groundwater was not encountered within the exploratory test holes to the maximum explored depth of 5 feet below ground surface (bgs). Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

PERCOLATION TESTING AND PROCEDURE

Percolation testing was performed to assess the general percolation rates of the onsite soils for the design of an onsite infiltration system.

The continuous pre-soak (falling-head) test procedure was utilized for testing. Water was allowed to presoak in each test hole prior to obtaining test readings. Following the presoak period, the drop in water level in each hole was monitored every 10 to 30 minutes to determine the appropriate method for testing. Test holes were refilled following each reading or when the water depth was below 6 inches. Test times ranged from 120 to 150 minutes. The drop in water level was recorded to the nearest $1/10^{th}$ inch to produce conservative water level readings.

SUMMARY OF PERCOLATION TEST RESULTS

Tests results are summarized below:

Test Hole No.	Rate (Inch/Hour)
1	1.3
2	1.4
3	1.2

Based on the obtained field data, 1.2 inches per hour should be utilized in the design of the proposed onsite drain system. The base of the system should be founded into natural soils.

It should be noted that the infiltration rates determined are ultimate rates based upon field test results. An appropriate safety factor should be applied to account for subsoil inconsistencies and potential silting of the percolating soils. The safety factor should be determined with consideration to other factors in the stormwater retention system design (particularly stormwater volume estimates) and the safety factors associated with those design components.

The Storm water Manager's Resource Center (SMRC) web site (http://www.stormwatercenter.net/) includes guidelines for disposal of storm water with respect to setback of structures. It is included in the criteria that infiltration facilities should be setback 10 feet down-gradient from structures. In order to avoid potential adversely impacting any existing structures, we recommend that any infiltration system be kept a horizontal distance of at least 10 feet from the edge of new building and the property line.

LIMITATIONS

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering and engineering geologic principals and practice within our opinion at this time in Southern California. Our conclusions and recommendations are based on the results of the field investigations, combined with an interpolation of subsurface conditions between and beyond exploration locations.

As the project evolves, our continued consultation and construction monitoring should be considered. GeoBoden should review plans and specifications to ensure the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this study are valid. Where significant design changes occur, GeoBoden may be required to augment or modify these recommendations. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and/or modified recommendations. This report was written for Client, and the design team members, and only for the proposed development described herein. We are not responsible for technical interpretations made by others, or exploratory information that has not been described or documented in this report. Specific questions or interpretations concerning our findings and conclusions may require written clarification.

We appreciate the opportunity to provide service to you on this project. If you have questions regarding this letter or the data included, please contact the undersigned.

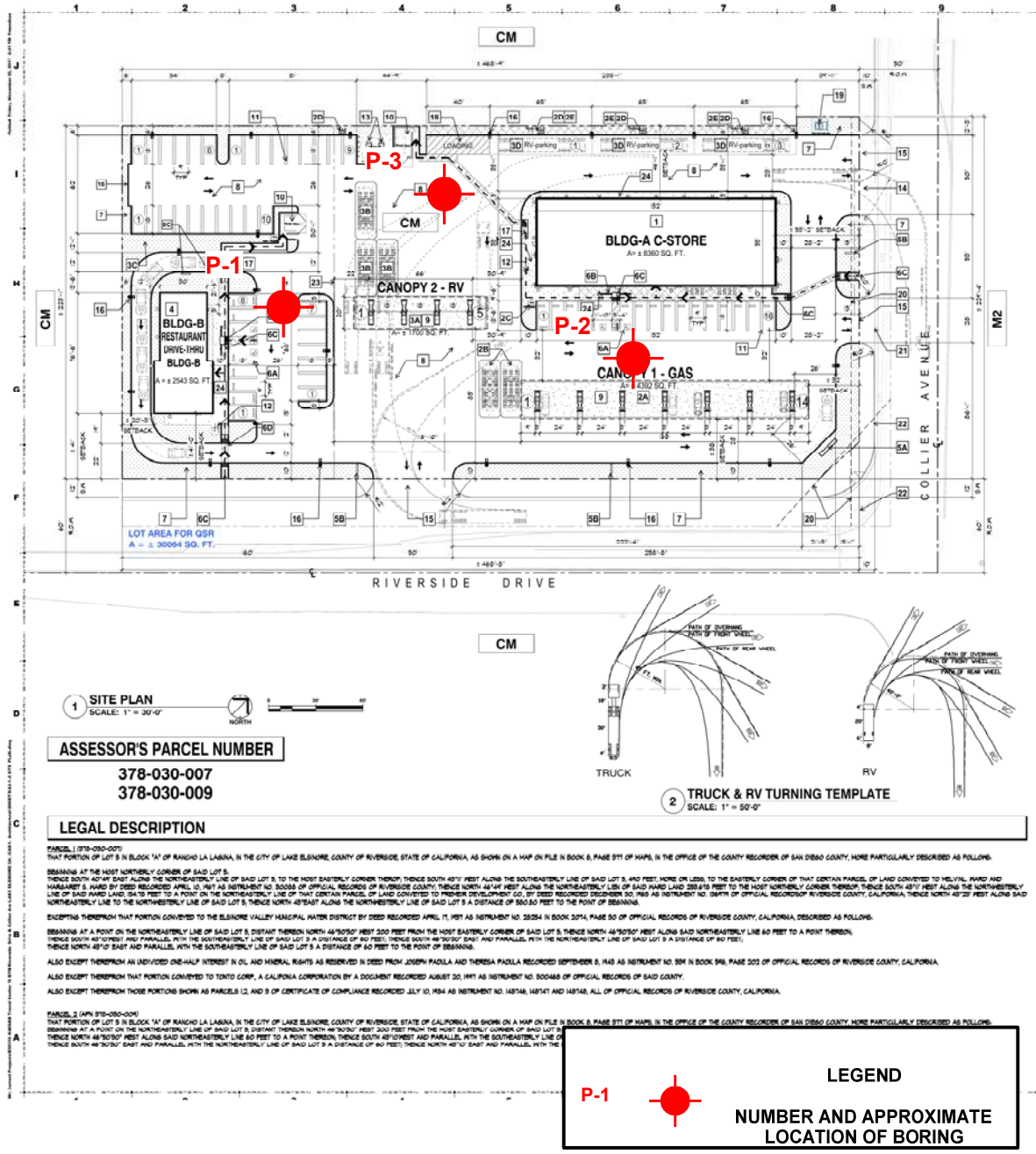
Sincerely,
GEOBODEN, INC.

Cyrus Radvar
Principal Engineer, G.E. 2742

Copies: 3/Addressee

Attachments:

Figure 1 – Percolation Test Holes Location Map
Appendix A – Test Holes Logs



ASSESSOR'S PARCEL NUMBER

378-030-007
378-030-009

LEGAL DESCRIPTION

PARCEL 1 (378-030-007)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 5;
THENCE SOUTH 40°49' EAST ALONG THE NORTHEASTERLY LINE OF SAID LOT 5, TO THE MOST EASTERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE SOUTHEASTERLY LINE OF SAID LOT 5, 440 FEET, MORE OR LESS, TO THE EASTERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO MELVIN L. WARD AND MARGARET S. WARD BY DEED RECORDED APRIL 10, 1961 AS INSTRUMENT NO. 30058 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY; THENCE NORTH 40°49' WEST ALONG THE NORTHEASTERLY LINE OF SAID WARD LAND, 284.78 FEET TO A POINT ON THE NORTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND CONVEYED TO PIONEER DEVELOPMENT CO., BY DEED RECORDED DECEMBER 30, 1960 AS INSTRUMENT NO. 138479 OF OFFICIAL RECORDSOF RIVERSIDE COUNTY, CALIFORNIA; THENCE NORTH 49°23' WEST ALONG SAID NORTHEASTERLY LINE TO THE NORTHWESTERLY LINE OF SAID LOT 5; THENCE NORTH 49°EAST ALONG THE NORTHWESTERLY LINE OF SAID LOT 5 A DISTANCE OF 550.50 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT BY DEED RECORDED APRIL 17, 1957 AS INSTRUMENT NO. 28254 IN BOOK 3074, PAGE 50 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5; THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON;
THENCE SOUTH 40°10'10" WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE NORTH 40°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN OIL AND MINERAL RIGHTS AS RESERVED IN DEED FROM JOSEPH PADILLA AND THERESA PADILLA RECORDED SEPTEMBER 8, 1948 AS INSTRUMENT NO. 594 IN BOOK 596, PAGE 202 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO TONTO CORP., A CALIFONIA CORPORATION BY A DOCUMENT RECORDED AUGUST 20, 1991 AS INSTRUMENT NO. 300468 OF OFFICIAL RECORDS OF SAID COUNTY.

ALSO EXCEPT THEREFROM THOSE PORTIONS SHOWN AS PARCELS 12, AND 9 OF CERTIFICATE OF COMPLIANCE RECORDED JULY 10, 1984 AS INSTRUMENT NO. 148746, 148747 AND 148748, ALL OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (APN 378-030-004)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5;
THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON; THENCE SOUTH 40°10' WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE
THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE NORTH 40°10' EAST AND PARALLEL WITH THE

P-1 — **LEGEND**

NUMBER AND APPROXIMATE LOCATION OF BORING

LEGEND

- NO. OF PARKING SPACES
- ACCESSIBLE PARKING
- PROPERTY LINE (BEFORE R.O.W. DEDICATION)
- PROPERTY LINE (AFTER R.O.W. DEDICATION)
- HANDICAP PATH OF TRAVEL
- CONCRETE PAVING AREA
- LANDSCAPED AREA
- DECORATIVE STAMPED CONCRETE
- WALL MOUNTED AREA LIGHTS
- DIRECTIONAL ARROW
- AREA LIGHTS
- (E) FIRE HYDRANT

SITE KEY NOTES

1 CONVENIENCE STORE
2A GAS STATION CANOPY AND FUEL DISPENSERS FOR AUTOS
2B UNDERGROUND STORAGE TANK
2C VENT RISER WITH CARBON CANISTER
2D AIR & WATER UNIT
2E TRASH BIN
3A GAS STATION CANOPY AND FUEL DISPENSERS OR R.V. & TRUCKS
3B UNDERGROUND STORAGE TANK
3C VENT RISER WITH CARBON CANISTER
3D RV PARKING W/ DUMP STATION
4 FASTFOOD WITH DRIVE-THRU
5A MONUMENT SIGN (UNDER SEPARATE PERMIT)
5B PRICE SIGN (UNDER SEPARATE PERMIT)
5C DRIVE THRU MENU BOARD SIGN
6A ACCESSIBLE PARKING (WITH WHEELCHAIR WHERE REQUIRED)
6B ACCESSIBLE PARKING SIGN
6C ADA ACCESSIBLE RAMP & TRUNCATED DOME PAVER
6D ADA ACCESSIBLE PATH STRIPING (2% MAX CROSS SLOPE)
7 LANDSCAPE WITH 6" CONCRETE CURB
8 ASPHALT PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
9 CONCRETE PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
10 TRASH ENCLOSURE (PER CITY STANDARD WHERE APPLICABLE)
11 PARKING STRIPING AS PER CITY STANDARDS (WITH WHEELCHAIR WHERE REQUIRED)
12 BIKE PARKING RACK
13 PROPANE TANK
14 (E) DRIVEWAY TO REMOVE, CONSTRUCT (N) SIDEWALK PER CITY STANDARDS
15 (N) DRIVEWAY PER CITY STANDARDS NO. 108A
16 AREA LIGHTS
17 SERVICE RAMP
18 SERVICE LOADING AREA
19 PROPOSED LOCATION OF TRANSFORMER
20 (E) WATER & TELEPHONE EASEMENT
21 (E) POWER POLE (TO BE RELOCATED PER CITY R.O.W. WIDENING)
22 (E) CURB, GUTTER & SIDEWALK (TO BE RELOCATED PER CITY R.O.W. WIDENING)
23 PROPOSED NEW PARCEL LINE FOR QSR WITH DRIVE-THRU
24 CONCRETE WALKWAY

VICINITY MAP

PROJECT DATA

ZONING	C-M (COMMERCIAL MANUFACTURING)	
LAND USE	COMMERCIAL	
AREA OF SITE	± 124,045 S.F. (± 2.85 ACRES) (BEFORE R.O.W. DEDICATION) ± 104,824 S.F. (± 2.34 ACRES) (AFTER R.O.W. DEDICATION)	
BLDG SETBACKS	REQUIRED	PROPOSED
FRONT	20'-0"	20'-0" / 41'-0"
REAR	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	46'-1"
SIDE (YARD)	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	20'-9"
SIDE (STREET)	15'-0"	52'-0" / 51'-0"
LANDSCAPE AREA	12%	16.45% (± 17,140 S.F.)
FLOOR AREA RATIO	-	0.152
LOT COVERAGE	-	18.2%
MAXIMUM HEIGHT	45'-0"	± 26'-0"
PARKING (SEE PARKING COMPUTATION BELOW)	64	75

BUILDING DATA

(N) BLDG-A CONVENIENCE STORE

AREA	± 8,360 SF
OCCUPANCY	M
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 26'-0"
FIRE SPRINKLER	YES

(N) BLDG CANOPY (FOR AUTOS)

AREA	± 4,312 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 18'-0"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG CANOPY (FOR R.V.s)

AREA	± 1,700 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 14'-8"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG-B FASTFOOD REATAURANT W/ DRIVE-THRU

AREA	± 2,543 SF
OCCUPANCY	A-2
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 22'-2"
FIRE SPRINKLER	NONE

PARKING ANALYSIS

PARKING STANDARDS

TYPE	SIZE
REGULAR	9'-0" X 18'-0"
PARALLEL	8'-0" X 23'-0"
HANDICAP	11'-0" X 18'-0" VAN ACCESSIBLE
LOADING	12'-0" X 40'-0" (TYPE-B)

PARKING REQUIREMENTS

USE	REQUIRED	PROPOSED
C-STORE (RETAIL AREA) (± 8,760 SF)	17	14 (4 CANOPIES)
FORMULA: 1 SP PER 400 SF (CM-DISTRICT)		
C-STORE (QSR AREA) (± 1,800 SF)	21	25
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		
FASTFOOD RESTAURANT	31	31
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		

HANDICAP PARKING REQUIREMENTS

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (3)		(4)

CLEAN AIR VEHICLE PARKING

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (6)		(6)

TOTAL PARKING SPACES	64	75

KARAKI WSe
WESTERN STATES ENGINEERING
A DESIGN-BUILD COMPANY
4667 E. LA PALMA STE. 707
TEL: (714)693-9300 FAX: (714)693-1002
CONSULTANT/ SEALS

SUBMITTAL
NO. DESCRIPTION BY DATE
1
2
3
4

REVISIONS
NO. DESCRIPTION BY DATE
△
△
△
△

OWNER NAME & ADDRESS
MR. RON KASSAB

PROJECT NAME & ADDRESS
THE KASSAB TRAVEL CENTER
Gas Station, RV Fueling Station
QSR w/ Drive-Thru
29301 RIVERSIDE DRIVE
LAKE ELSINORE CA 92530

NOTE TO CONTRACTOR

CONFIDENTIALITY STATEMENT

DESIGNED BY: WS
DRAWN BY: WS
CHECKED BY: JK
DATE DRAWN: 11.03.17
SCALE: 1" = 30'-0"
SHEET TITLE
SITE PLAN

BLDG SHEET NUMBER
AS-1.0
JOB No E95010
CUP No. CUP NO.

GEOBODEN INC. Geotechnical Consultants	PERCOLATION BORING LOCATION PLAN Proposed Kassab Travel Center 29301 Riverside Drive Lake Elsinore, California	Figure By S.R. Map No. XX Date 12-30-17 Project No. Lake Elsinore Figure No. 2

GEOBODEN, INC.

BORING NUMBER P-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

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GEOBODEN, INC.

BORING NUMBER P-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

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GEOBODEN, INC.

BORING NUMBER P-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): strong brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

Appendix G

Phase I Environmental Site Assessment

PHASE I ENVIRONMENTAL SITE ASSESSMENT
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA 92530

Prepared for:

Mr. Riyadh Kassab

4580 University Avenue

San Diego, CA 92105

Prepared by:

GEOROX ENGINEERING
622 Veneto
Irvine, California 92614

March, 11, 2016

JOB NO. E-1604

GEOROX ENGINEERING
Geotechnical and Environmental Consultants
622 Veneto, Irvine, CA 92614 T: 949-533-9059

March 11, 2016 Project No: E-1604

Mr. Riyadh Kassab
4580 University Avenue
San Diego, California 92105

Subject: Phase I Environmental Site Assessment
29301 Riverside Drive
Lake Elsinore, California 92530

Dear Mr. Kassab:

GeoRox Engineering is pleased to submit herewith our Phase I Environmental Site Assessment for the for the above referenced property. The assessment was performed utilizing applicable codes and standards. It has been a pleasure to be of service to you on this project. Should you have any questions, please do not hesitate to contact us.

Sincerely,

GEOROX ENGINEERING

Alex Shirazi, P.E.
Project Engineer

GeoRox Engineering
Geotechnical and Environmental Consultanting

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EXECUTIVE SUMMARY

This executive summary is a synopsis of findings based on our Phase I ESA. For detailed information regarding the findings, please refer to the text of our report.

Mr. Riyadh Kassab (Mr. Kassab) engaged GeoRox Engineering (GeoRox) to perform a Phase I Environmental Subject Property Assessment (ESA) for the vacant property located at 29301 Riverside Drive, Lake Elsinore, Riverside County, California (Subject Property).

The Subject Property is located in a mixed undeveloped and commercial area in the city of Lake Elsinore, California. The Subject Property consists of two parcels (APN 378030007 and 378030009) approximately 2.95 acres in size. The rectangular-shaped Subject Property is bounded to the northwest by undeveloped land followed by commercial/industrial development and Collier Avenue to the northeast, to the south by Riverside Drive, and to the east Collier Avenue/Riverside Drive Intersection, and to the west by undeveloped land.

According to aerial photographs, the Subject Property was historically developed with a water reservoir as early as 1938 to at least 1978, an unknown structure from as early as1978 to at least 1985, and was undeveloped from at least 1989 to present.

The Subject Property did not appear on current regulatory database lists that were reviewed during this assessment.

EZ Products, 17999 Collier Avenue, is located approximately 200 to the northwest of the Subject Property and is presumed to be higher elevation (hydrogically up/cross gradient). EZ Products is an active manufacturer of bolt, nut, screw, rivet, and washers. According to the regulatory database, this facility is listed as a RCRA-SQG, FINDS and ECHO site. Online research from the California DTSC Hazardous Waste Tracking System revealed evidence of tetrachloroethylene (PERC) on site for the years 1999 (1.48 tons), 2000 (0.34 tons), and 2001 (2.13 tons). According to the EPA ECHO website and the regulatory database, this facility specified a three-year period of no violations. Based on the inferred direction groundwater flow, the amount (over two tons) of PERC onsite for three years, and close proximity to the Subject Property, this facility represents an environmental issue. Based on the amount of PERC onsite (3.95 tons), inferred direction of groundwater flow, and relative distance from the Subject Property, this facility represents an environmental issue. Based on the lack of documented release, this site is not expected to represent an environmental concern to the Subject Property, at this time.

In our opinion, based on the information obtained during this assessment, additional subsurface soil sampling at the Subject Property (Phase-II ESA) is not recommended.

1.0 INTRODUCTION

Mr. Riyadh Kassab (Mr. Kassab) engaged GeoRox Engineering (GeoRox) to perform a Phase I Environmental Site Assessment (ESA) for the vacant property located at 29301 Riverside Drive, Lake Elsinore, Riverside County, California (Subject Property).

1.1 PURPOSE

The purpose of the Phase I ESA was to identify certain obvious environmental concerns arising from activities on the Subject Property or nearby properties. Activities of concern are those that may have contaminated, or have the potential to contaminate, the Subject Property's soil or ground water. The purpose of this assessment was not to determine the actual presence, degree, or extent of contamination, if any, on the Subject Property. Such a determination would require additional exploratory work.

The scope of services was performed in general accordance with ASTM Designation E 1527-13 *Standard Practice for Environmental Subject Property Assessments: Phase I Environmental Subject Property Assessment Process*. Any deviations to the ASTM E 1527-13 Standard can be found in Section 11.0. No significant assumptions were made during the assessment.

1.2 DETAILED SCOPE-OF-SERVICES

A Phase I ESA is intended to be a general characterization of selected environmental concerns. The characterization is based on readily ascertainable information and Subject Property observations. The assessment included the following services:

Geology/Hydrogeology

We reviewed selected available references regarding the local geology and hydrogeology to assist in assessing potential pathways of contaminant migration. We relied on sources such as United States Geological Survey topographic maps, ground-water reports, soils surveys, and geologic reports.

Subject Property and Area Reconnaissance

The objective of this reconnaissance was to identify obvious sources of contamination (actual and potential) at the Subject Property that could become environmental liabilities. We looked for signs of disturbances, stained soil, stressed vegetation, and other similar, obvious surficial evidence of potential contamination. The purpose of this work was not to determine the presence, degree, or extent of contamination at the Subject Property. This would require additional assessment including sampling and chemical analyses.

During the Subject Property reconnaissance, we looked for fluid-containing major electrical devices (e.g., transformers or capacitor banks) likely to contain polychlorinated biphenyls

(PCBs). The PCB status of these devices was noted based on labeling, and we made note of the general conditions of these devices, including evidence of leakage. We did not assess minor suspect PCB items such as fluorescent light fixture ballasts, or sample or test dielectric fluids.

During the Subject Property reconnaissance, we also looked for evidence of aboveground storage tanks (ASTs) and underground storage tanks (USTs) such as vent pipes, fill pipes, fuel dispensers, and other obvious evidence of ASTs and USTs.

We also conducted an area reconnaissance to assist in assessing if adjacent or nearby land uses may have contaminated the Subject Property. The area reconnaissance was conducted by touring the area by automobile and viewing particular businesses from public rights-of-way. Off-Subject Property properties were not entered.

Historical Review

We consulted selected references to infer past land uses on or near the Subject Property that might have contributed to soil or ground-water contamination at the Subject Property. We used the following types of references and information (depending on availability):

- Aerial photographs
- City directories
- Sanborn fire insurance maps
- Building permits
- Interviews with property management
- Information you provide
- Oil well maps, ground-water maps, and water well data

The period of concern is from the present, back to the Subject Property's first developed use (e.g., residential, commercial, or industrial), or back to any available time, whichever is earlier.

Regulatory Status Review

We reviewed excerpts of federal and state environmental regulatory agency lists for records regarding possible hazardous waste generation, transportation, treatment, storage, disposal, and release at the Subject Property or in the vicinity that may potentially threaten the Subject Property. The databases we reviewed include those indicated in the ASTM E 1527-05 standard, as well as selected local databases, as appropriate.

1.3 LIMITATIONS

The findings and opinions in this report are relevant to the dates of our Subject Property work and should not be relied on to represent conditions at substantially later dates. This report is prepared for the exclusive use of Mr. Kassab. Use of this report by any person or entity other than Mr. Kassab is expressly forbidden unless such other person or entity obtains written authorization from both Mr. Kassab and Georox. Use of this report by such other person or entity without the written authorization of Mr. Kassab and Georox will be at such other person's or entity's sole risk, and will be without legal exposure to Georox.

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable environmental consultants practicing in this or similar locations. This warranty is in lieu of all other warranties, expressed or implied.

The opinions included herein are based on information obtained during the study and our experience. If additional information becomes available, which might impact our environmental conclusions, we request the opportunity to review the information, reassess the potential concerns, and modify our opinion, if warranted. If this assessment included a review of reports prepared by other consultants, it must be recognized that Georox has no responsibility for the accuracy of information contained therein.

Although this assessment has attempted to identify the potential for contamination of the Subject Property, potential sources of contamination may have escaped detection due to: (1) the limited scope of this assessment, (2) the inaccuracy of public records, and (3) the presence of undetected and unreported environmental accidents.

2.0 SUBJECT PROPERTY DESCRIPTION

2.1 SUBJECT PROPERTY LOCATION

The Subject Property is located at 29301 Riverside Drive, Lake Elsinore, Riverside County, California (Subject Property). The Subject Property is depicted as developed with a water reservoir on the U.S. Geological Survey (USGS) Topographic Map *Lake Elsinore, California* Quadrangle (1988).

2.2 CURRENT USE OF THE SUBJECT PROPERTY

The subject property is currently a vacant, undeveloped land.

2.3 SUBJECT PROPERTY AND VICINITY CHARACTERISTICS

The Subject Property is located in a mixed undeveloped and commercial area in the city of Lake Elsinore, California. The Subject Property consists of two parcels (APN 378030007 and 378030009) approximately 2.95 acres in size. The rectangular-shaped Subject Property is bounded to the northwest by undeveloped land followed by commercial/industrial development and Collier Avenue to the northeast, to the south by Riverside Drive, and to the east Collier Avenue/Riverside Drive Intersection, and to the west by undeveloped land.

3.0 PHYSICAL SETTING

3.1 SURFACE DRAINAGE/FLOOD MAP

The Subject Property is situated at an elevation of approximately 1,268 feet above mean sea level (msl). Surface drainage (precipitation that does not infiltrate into the subsurface soils) follows the topographical gradient which is generally toward the south/southwest towards Lake Elsinore.

The subject property does not appear to be a designated wetland area, based on information obtained from the United States Department of Agriculture; however, a comprehensive wetlands survey would be required in order to formally determine actual wetlands on the subject property.

No surface impoundments, wetlands, natural catch basins, settling ponds, or lagoons were observed on the subject property. No drywells were observed on the subject property.

GEOROX performed a review of the Flood Insurance Rate Map, published by the Federal Emergency Management Agency. According to Community Panel Number 2028 of 3805 and Map Number 0605C2028G, dated August 28, 2008, the subject property appears to be located in Zone X, an area located outside of the 100-year and 500-year flood plains.

3.2 GEOLOGY

The Elsinore quadrangle is located in the northern part of the Peninsular Ranges Province and includes parts of two structural blocks, or structural subdivisions of the province. The active Elsinore Fault Zone diagonally crosses the southwest corner of the quadrangle, and is a major element of the right-lateral strike-slip San Andreas Fault system. The Elsinore Fault Zone separates the Santa Ana Mountains block west of the fault zone from the Perris block to the east. Internally both blocks are relatively stable and within the quadrangle are characterized by the presence of widespread erosional surfaces of low relief. Within the quadrangle the Santa Ana Mountains block is underlain by undifferentiated granitic rocks of the Cretaceous Peninsular Ranges batholith, but to the west, includes widespread pre-batholithic Mesozoic rocks.

The Perris block is underlain by a combination of batholithic and prebatholithic rocks, the latter consisting of metasedimentary rocks of low metamorphic grade; sub-greenschist grade. The most abundant lithology is phyllite but includes locally thick sections of impure quartzite. Minor sills, dikes, and small elongate plutons of fine-grained hornblende gabbro intrude the phyllite. Thin layers of tremolite-bearing marble occur locally. Also local are thin layers of manganese-bearing rocks. Both rhodonite and manganese oxides occur in these layers. The phyllite has a regular northwest strike throughout the main body of metamorphic rock giving rise to a homoclinal section over 25,000 feet thick. The layering-schistocity of these rocks is transposed bedding and is not stratigraphic thickness.

In the northwest corner of the quadrangle is a series of Cretaceous volcanic and associated sedimentary rocks in the northwest corner of the quadrangle contain widespread primary sedimentary structures and appear to post date the metamorphism of the phyllite. The volcanic rocks are part of the Estelle Mountain volcanics of primarily rhyolitic composition. The sedimentary rocks are well indurated, perhaps incipiently metamorphosed, siliceous rocks containing local conglomerate beds.

The Elsinore Groundwater Basin contains alluvial fan, floodplain, and lucustrine deposits, which are underlain by alluvium of the Pauba Formation. Alluvial fan deposits of gravel, sand, silt, and clay are found near the western and northeastern edges of the basin emanating from the adjacent crystalline mountains. The interior of the valley contains floodplain deposits that reach a thickness of about 200 feet and contain stringers of sand and gravel in finer silt and clay. In the zone of inundation of Lake Elsinore, finegrained lacustrine deposits of sand, silt, and clay reach 800 feet in thickness. The Pleistocene age Pauba Formation is a composed of alluvial sandstone and fanglomerate members (Morton and others 1999) that reach a maximum thickness of about 2,200 feet beneath lake Elsinore (DWR 1981). This is the principal water-bearing unit of the basin, with the most productive wells extracting from alluvial sand and gravel bodies that occur as stringers within less pervious silt- and clay–rich deposits. In general, sediments are coarser near the margins of the basin and become finer toward Lake Elsinore.

3.3 GROUNDWATER

The Elsinore Groundwater Basin underlies the Elsinore Valley in western Riverside County. The basin is bounded on the southwest by the Santa Ana and Elsinore Mountains along the Willard fault, a splay of the active Elsinore fault zone. The basin adjoins the Temecula Valley Groundwater Basin on the southeast at a low surface drainage divide. The basin is bounded on the northwest by the Temescal Subbasin of the Upper Santa Ana River Valley Groundwater Basin at a constriction in Temescal Wash. The basin is bounded on the northeast by nonwater-bearing rocks of the Peninsular Ranges along the Glen Ivy fault. Average annual precipitation ranges from 12 to 14 inches. Lake Elsinore lies in a closed basin formed between strands of the active Elsinore fault zone.

Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels. According to data from Geotracker website, a nearby gas station reported groundwater at 30 ft bgs and flows towards the south.

3.4 OIL AND GAS WELLS

Oil and gas wells are potential concerns when they seep oil or gas, are not abandoned to current regulations, or have associated surface contamination. They may also be associated with methane hazards. This section discusses the oil wells reported on the records we reviewed. Unreported "wildcat" oil wells could be on or near the Subject Property.

The Subject Property is not located within an Oilfield.

4.0 REVIEW OF PREVIOUS ENVIRONMENTAL REPORTS

Previous reports were not supplied to GeoRox from Mr. Kassab.

5.0 SUBJECT PROPERTY AND AREA RECONNAISANCE

5.1 METHODOLOGY AND LIMITING CONDITIONS

In performing the Subject Property and area reconnaissance, our assessor describes the Subject Property and looks for obvious signs of items that may be a source of environmental concern, such as aboveground storage tanks (ASTs); underground storage tanks (USTs), hazardous materials, and hazardous wastes.

Some of the items or activities we observe on the Subject Property may be associated with environmental concerns. Certain businesses or occupations may typically use hazardous substances or create hazardous waste. Storage tanks may leak and contaminate soil and ground water. Other signs of potential environmental concerns include unusual odors, pools of liquids, drums, unidentified containers, items that may contain polychlorinated biphenyls (PCBs), stains or corrosion, and drains or sumps.

Mr. Alex Shirazi performed the Subject Property visit and reconnaissance on March 5, 2016.

5.2 SUBJECT PROPERTY RECONNNAISSANCE

The Subject Property is located in a mixed undeveloped and commercial area in the city of Lake Elsinore, California. The Subject Property consists of two parcels (APN 378030007 and 378030009) approximately 2.95 acres in size. The rectangular-shaped Subject Property is bounded to the northwest by undeveloped land followed by commercial/industrial development and Collier Avenue to the northeast, to the south by Riverside Drive, and to the east Collier Avenue/Riverside Drive Intersection, and to the west by undeveloped land.

5.2.1 Interior Observations

The Subject Property is a vacant, undeveloped lot.

5.2.2 Aboveground and Underground Storage Tanks

No indications of USTs were observed during the Subject Property visit.

5.2.3 Hazardous Substances and Petroleum Products

No hazardous substances and/or petroleum products were observed on the Subject Property.

5.2.4 Solid Waste

No hazardous substances and/or petroleum products were observed on the Subject Property.

5.2.5 Electrical Transformers

Pad mounted and pole mounted transformers were observed on the Subject Property.

5.2.6 Wetlands

The subject property does not appear to be a designated wetland area, based on information obtained from the United States Department of Agriculture; however, a comprehensive wetlands survey would be required in order to formally determine actual wetlands on the subject property.

No surface impoundments, wetlands, natural catch basins, settling ponds, or lagoons were observed on the subject property. No drywells were observed on the subject property.

5.2.7 Wells and Mine Shafts

No mine shafts were observed on the Subject Property during the reconnaissance.

5.2.8 Pits, Ponds and Lagoons

Evidence of ponds, pits and lagoons were not observed on the Subject Property during the reconnaissance. Historic aerials and topographic maps indicate the Subject Property was improved with a water reservoir.

5.2.9 Effluent Discharge

Evidence of septic systems was not observed on the Subject Property.

5.2.10 Asbestos

The Subject Property is a vacant land.

5.2.11 Lead-Based Paint

The Subject Property is a vacant land.

5.2.12 Radon

According to EDR report and Radon Map of California, the site is located in Zone 2 of the USEPA's radon designation categories. Zone 2 indicates the expected radon concentration of the site is above 2.0 picoCuries per Liter (pCi/L) and less than 4.0 pCi/L. The EPA action level for radon is 4.0 pCi/L. Based on the future development (commercial nature) of the subject property, radon is not a concern.

5.2.13 Mold

The Subject Property is a vacant, undeveloped land.

5.2.14 Dry Cleaning

The Subject Property is a vacant, undeveloped land. No dry cleaners are located adjacent to the Subject Property.

5.2.15 Others

Other items that might be considered (RECs) relative to the Subject Property were not observed during the Subject Property reconnaissance.

5.3 AREA RECONNAISSANCE

The area reconnaissance helps us evaluate whether adjacent or nearby property uses may have contaminated the Subject Property. Our assessor conducted the reconnaissance by touring the area by automobile and viewing particular businesses from public rights of way, but did not enter off Subject Property properties. The findings of our area reconnaissance are discussed according to their direction from the Subject Property: north, east, south, and west.

5.3.1 North

The Subject Property is bound to the northwest by undeveloped land followed by a commercial/industrial warehouse (EZ Products) and Collier Avenue to the northeast.

5.3.2 South

The Subject Property is bound to the south by Riverside Drive and recently graded land beyond.

5.3.3 East

The Subject Property is bound to the east by Collier Avenue/Riverside Drive Intersection.

5.3.4 West

The Subject Property is bound by undeveloped land.

5.3.5 Summary of Area Reconnaissance

No environmentally sensitive tenants were located adjacent to the subject property.

6.0 INTERVIEWS

6.1 INTERVIEW WITH CURRENT SUBJECT PROPERTY TENANT

The Subject Property owner not available for interview.

7.0 HISTORICAL RECORDS REVIEW

As part of the historical review, we reviewed information on the past uses of the Subject Property and nearby properties. We assessed whether these uses may have contaminated the Subject Property's soil or ground water. The earliest historical references we typically consult date from 1940 or from the first developed use of the Subject Property or nearby properties. Information sources we commonly use include aerial photographs, fire insurance maps, and USGS topographic maps.

The historical review results in two histories, based on the information reviewed: a history of the past use of the Subject Property and a history of the past use of the adjacent properties.

7.1 HISTORICAL RESEARCH

7.1.1 Aerial Photographs

We reviewed available aerial photographs dated 1938, 1949, 1953, 1961, 1967, 1978, 1985, 1989, 1990, 1994, 2002, 2005, 2009, 2010, and 2012.

From 1938 to 1978, the Subject Property appears to be a water reservoir. However, from from at least 1978 to at least 1985, the Subject Property appears to be developed with an unknown square structure. From 1989 to 2012, the Subject Property appears to be native vegetation (undeveloped). The surrounding properties historically were utilized for agricultural purposes. In the mid 1980's the general area to the northwest and northeast appeared to be developed for commercial/industrial development. The properties to the west and south remain undeveloped in recent aerials.

7.1.2 Sanborn Maps

The Subject Property was un-impalpable according to the Sanborn fire insurance maps provided by EDR.

7.1.3 Topographic Maps

The United States Geological Survey (USGS) *Lake Elsinore, California* Quadrangle 7.5-minute series topographic map was reviewed for this ESA. According to the contour lines on the 1988 topographic map, the subject property is located at approximately 1268 feet above mean sea level (MSL). The contour lines in the area of the subject property indicate the area is sloping gently toward the south/southwest. The subject property is depicted as developed with a water reservoir.

An online review of historic topographic maps was conducted. The Subject Property appears to be developed with a water reservoir in 1953, 1954, 1970, 1975, 1982, 1985, and 1988.

7.1.4 City Directory

The EDR City Directory includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at approximate five year intervals.

Business directories including city, cross reference and telephone directories were reviewed at Sherman Library and Gardens, Newport Beach, California, for the years spanning 1985 through 2010.

The Subject Property address was not listed in the City Directory. The surrounding adjacent properties were not identified as sensitive environmental tenants.

7.2 AGENCIES CONTACTS

- City of Lake Elsinore: Building Department, Planning Division, Fire Department, Online GIS mapping
- County of Riverside, Online Assessor Database
- Riverside County Health Department, Records Request: response has yet to be received.
- South Coast Air Quality Management District, Online records search: no records on file for the Subject Property
- California Department of Toxic Substances and Control, Envirostor Online Database: no records on file for the Subject Property.
- California State Water Board, Geotracker Online Database, no records on file for the Subject Property.

8.0 REGULATORY AGENCY INFORMATION

We reviewed excerpts of federal, state, and local environmental regulatory agency lists for those properties which were within the search ranges as noted in the excerpts that were prepared by EDR, an environmental data search firm. EDR revises their lists periodically when they receive updates from the agencies. The date of the latest revision is shown on their report, which is appended to this report as Appendix B. The EDR with Geocheck report also summarizes the origin and purpose of each list.

Please note that regulatory listings are limited and include only those sites that are known to the regulatory agencies at the time of publication to be contaminated or in the process of evaluation for potential contamination. Our scope of services did not include an on-site review of agency files.

Regulatory Database	Search Distance	On-site listings	Adj. Property Listings	Total Within Search Distance
Fed. NPL	1-mile	0	0	0
Fed. Proposed NPL	1-mile	0	0	0
Fed. Delisted NPL	½-mile	0	0	0
Fed. CERCLIS	½-mile	0	0	0
Fed. CERCLIS-NFRAP	½-mile	0	0	0
Fed. RCRA CORRACTS	1-mile	0	0	0
Fed. RCRA TSD	½-mile	0	0	0
Fed. RCRA Gen.	¼ -mile	0	1	0
US Eng. Controls	½-mile	0	0	0
US Inst. Controls	½-mile	0	0	0
Fed. ERNS	SP	0	--	--
State RESPONSE	1-mile	0	0	0

Regulatory Database	Search Distance	On-site listings	Adj. Property Listings	Total Within Search Distance
State ENVIROSTOR	1-mile	0	0	2
State & Tribal equiv. NPL and CERCLIS	1-mile	0	0	0
State & Tribal SWF/LF	½-mile	0	0	0
State & Tribal LUST	½-mile	0	0	0
State SLIC	½-mile	0	0	0
State & Tribal UST	¼ -mile	0	0	3
State & Tribal AST	¼ -mile	0	0	0
State & Tribal VCP	½-mile	0	0	0
US Brownfields	½-mile	0	0	0
SWRCY	½-mile	0	0	1
HAULERS	Site	0	--	--
HIST AUTO	1-mile	0	0	1

Three sites (nine listings total) are listed within 1-mile radius of the Subject Property. Two of the sites are not considered an environmental concern to the Subject Property based on the nature of the listings, inferred direction of groundwater flow and relative distance. The adjacent site is detailed below:

- EZ Products, 17999 Collier Avenue, is located approximately 200 to the northwest of the Subject Property and is presumed to be higher elevation (hydrogically up/cross gradient). EZ Products is an active manufacturer of bolt, nut, screw, rivet, and washers. According to the regulatory database, this facility is listed as a RCRA-SQG, FINDS and ECHO site. Online research from the California DTSC Hazardous Waste Tracking System revealed evidence of tetrachloroethylene (PERC) on site for the years 1999 (1.48 tons), 2000 (0.34 tons), and 2001 (2.13 tons). According to the EPA

ECHO website and the regulatory database, this facility specified a three-year period of no violations. Based on the inferred direction groundwater flow, the amount (over two tons) of PERC onsite for three years, and close proximity to the Subject Property, this facility represents an environmental issue. Based on the amount of PERC onsite, Inferred direction of groundwater flow, and relative distance from the Subject Property, this facility represents an environmental issue. Based on the lack of documented release, this site is not expected to represent an environmental concern to the Subject Property, at this time.

9.0 USER PROVIDED INFORMATION

9.1 OWNER, PROPERTY MANAGER, AND OCCUPANT

A Representative of the Subject Property Owner completed the Phase I ESA User Questionnaire. No environmentally sensitive information related to the subject property was identified. The completed questionnaire is attached in Appendix D.

The property is currently represented by DSGS and C. and M. Smyrniotos.

9.2 REASON FOR PERFORMING *PHASE I*

This Phase I Environmental Subject Property Assessment was performed as part of the due diligence process associated with the proposed commercial development of the Subject Property.

10.0 DEVIATIONS

10.1 DATA GAPS

No data gaps were identified during this assessment.

11.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

A *recognized environmental condition* (REC) refers to the presence or likely presence of any hazardous substance or petroleum product on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term REC includes hazardous substances and petroleum products even under conditions that might be in compliance with laws. The term is not intended to include "de minimis" conditions that do not present a threat to human health and/or the environment and that would not be subject to an enforcement action if brought to the attention of appropriate governmental agencies. The following was identified during the course of this assessment:

- GeoRox did not identify any RECs during the course of this assessment.

A controlled recognized environmental condition (CREC) refers to a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls. The following was identified during the course of this assessment:

- GeoRox did not identify any CRECs during the course of this assessment.

A historical recognized environmental condition (HREC) refers to an environmental condition which would have been considered a REC in the past, but which is no longer considered a REC based on subsequent assessment or regulatory closure. The following was identified during the course of this assessment:

- GeoRox did not identify any HRECs during the course of this assessment.

An environmental issue refers to environmental concerns identified by GeoRox, which do not qualify as RECs; however, require discussion. The following was identified during the course of this assessment:

GeoRox did identify one *environmental issues* during the course of this assessment and is detailed below:

- EZ Products, 17999 Collier Avenue, is located approximately 200 to the northwest of the Subject Property and is presumed to be higher elevation (hydrogically up/cross gradient). EZ Products is an active manufacturer of bolt, nut, screw, rivet, and washers. According to the regulatory database, this facility is listed as a RCRA-SQG, FINDS and ECHO site. Online research from the California DTSC Hazardous Waste Tracking System revealed evidence of tetrachloroethylene (PERC) on site for the years 1999 (1.48 tons), 2000 (0.34 tons), and 2001 (2.13 tons). According to the EPA ECHO website and the regulatory

database, this facility specified a three-year period of no violations. Based on the inferred direction groundwater flow, the amount (over two tons) of PERC onsite for three years, and close proximity to the Subject Property, this facility represents an environmental issue. Based on the amount of PERC onsite (3.95 tons), inferred direction of groundwater flow, and relative distance from the Subject Property, this facility represents an environmental issue. Based on the lack of documented release, this site is not expected to represent an environmental concern to the Subject Property, at this time.

In our opinion, based on the information obtained during this assessment, additional subsurface soil sampling at the Subject Property (Phase-II ESA) is not recommended.

12.0 LIMITATIONS AND EXCEPTIONS

The findings and opinions in this report are relevant to the dates of our Subject Property work. They should not be relied upon to represent conditions at later dates.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at the time of service. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The opinions included in this report are based on information obtained during the study and on our experience. If additional information becomes available that might affect our conclusions, we request the opportunity to review the information, reassess the potential environmental concerns, and modify our opinion, if warranted.

Although this assessment has attempted to identify the potential for Subject Property contamination, potential sources of contamination may have escaped detection. They may have been overlooked because of the limited scope of this assessment, the inaccuracy of public records, or the presence of undetected and unreported environmental concerns.

12.1 SIGNIFICANT ASSUMPTIONS

We assume the purpose of the Phase I ESA is to provide appropriate inquiry into the previous/current ownership and use of the Subject Property so that Mr. Kassab may qualify for CERCLA liability protection. Additionally, we assume that the information gathered and reviewed during this assessment is accurate.

12.1.1 Special Terms and Conditions

No special terms or conditions were made during the assessment.

12.1.2 User Reliance

This report has been prepared for Mr. Kassab to be used solely in evaluating potential environmental implications at the Subject Property. The report has not been prepared for use by other parties, and may not contain sufficient information for purposes of other parties or other uses. If other parties wish to rely on this report, a secondary Mr. Kassab agreement must be signed.

13.0 SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S)

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental professional as defined in §312.10 of 40 CFR 312.

Alex Shirazi, P.E.
Principal Engineer

We have the specific qualifications based on education, training, and experience to assess a property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

FIGURES

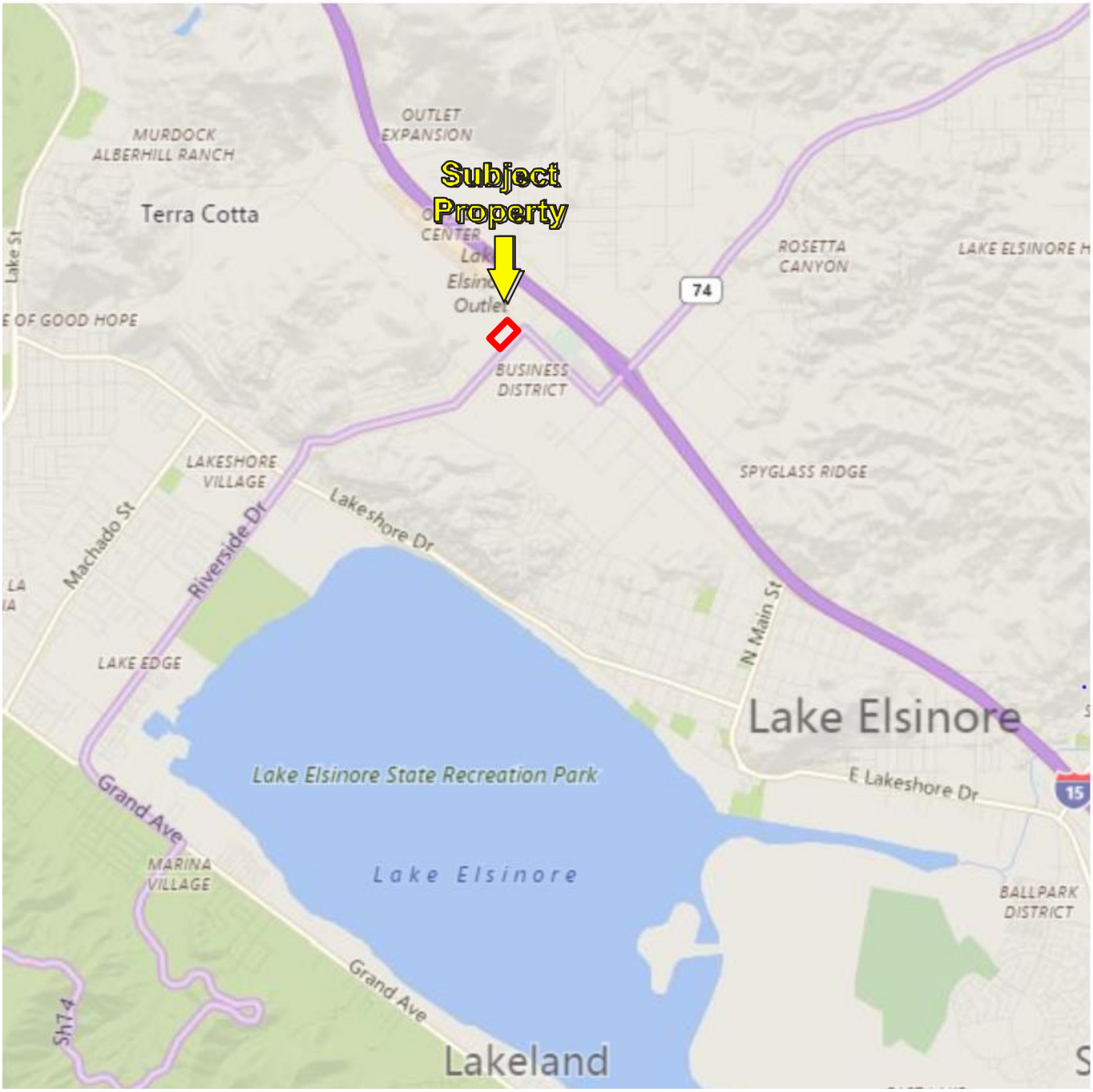
Subject Property Vicinity Map

Subject Property Site Plan

NORTH

Figure 2
Subject Property Site Plan
29301 Riverside Drive, Lake Elsinore, CA
Project No.: E-1604

GeoRox Engineering
Geotechnical and Environmental Consultanting



NORTH

Figure 1
Subject Property Vicinity Map
Vacant Lot – Lake Elsinore
Project No.: E-1604

GeoRox Engineering
Geotechnical and Environmental Consultanting

APPENDIX A

SUBJECT PROPERTY PHOTOGRAPHS

1: View of the Subject Property looking west

2: View of the Subject Property looking north

3: View of adjacent intersection to the east (Collier Avenue and Riverside Drive)

4: View of Subject Property and adjacent property to the northeast

APPENDIX B

THE EDR-RADIUS REPORT

Vacant Lot - Lake Elsinore
18181 Collier Ave
Lake Elsinore, CA 92530

Inquiry Number: 4551235.3
March 01, 2016

Certified Sanborn® Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

3/01/16

Site Name:
Vacant Lot - Lake Elsinore
18181 Collier Ave
Lake Elsinore, CA 92530

Client Name:
Geo Rox Engineering
622 Veneto
Irvine, CA 92614-0000

EDR Inquiry # 4551235.3

Contact: Alex

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Geo Rox Engineering were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Site Name: Vacant Lot - Lake Elsinore
Address: 18181 Collier Ave
City, State, Zip: Lake Elsinore, CA 92530
Cross Street:
P.O. # NA
Project: E-1604
Certification # 35F5-4409-AF6D

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results
Certification # 35F5-4409-AF6D

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Geo Rox Engineering (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

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E-1604 Lake Elsinore
Collier Avenue
Lake Elsinore, CA 92530

Inquiry Number: 4552616.2s
March 02, 2016

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

COLLIER AVENUE
LAKE ELSINORE, CA 92530

COORDINATES

Latitude (North):	33.6949200 - 33° 41' 41.71''
Longitude (West):	117.3468940 - 117° 20' 48.81''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	467850.2
UTM Y (Meters):	3728190.8
Elevation:	1268 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5636473 LAKE ELSINORE, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20120519
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
COLLIER AVENUE
LAKE ELSINORE, CA 92530

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	E Z PRODUCTS	17999 COLLIER AVE	RCRA-SQG, FINDS, ECHO	Higher	187, 0.035, ENE
A2	CANS PLUS RECYCLING	29170 RIVERSIDE DR U	SWRCY, NPDES	Higher	643, 0.122, NE
A3		29170 RIVERSIDE DR	EDR Hist Auto	Higher	643, 0.122, NE
B4	MBC CONTRUCTION LTD	29400 INDUSTRIAL CEN	SWEEPS UST, CA FID UST	Higher	1163, 0.220, SE
B5	MBC CONSTRUCTORS LTD	29400 ENTERPRISE WY	UST	Higher	1172, 0.222, SE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

EXECUTIVE SUMMARY

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ---------- State Response Sites

State- and tribal - equivalent CERCLIS

ENVIROSTOR ---------- EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

LUST ---------- Geotracker's Leaking Underground Fuel Tank Report
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
SLIC ---------- Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
AST ---------- Aboveground Petroleum Storage Tank Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

VCP ---------- Voluntary Cleanup Program Properties
INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ---------- Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ---------- Waste Management Unit Database
HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
ODI ---------- Open Dump Inventory
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- National Clandestine Laboratory Register

HIST Cal-Sites ---- Historical Calsites Database
SCH ---- School Property Evaluation Program
CDL ---- Clandestine Drug Labs
Toxic Pits ---- Toxic Pits Cleanup Act Sites
US CDL ---- Clandestine Drug Labs

Local Lists of Registered Storage Tanks

HIST UST ---- Hazardous Substance Storage Container Database

Local Land Records

LIENS ---- Environmental Liens Listing
LIENS 2 ---- CERCLA Lien Information
DEED ---- Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ---- Hazardous Materials Information Reporting System
CHMIRS ---- California Hazardous Material Incident Report System
LDS ---- Land Disposal Sites Listing
MCS ---- Military Cleanup Sites Listing
SPILLS 90 ---- SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ---- RCRA - Non Generators / No Longer Regulated
FUDS ---- Formerly Used Defense Sites
DOD ---- Department of Defense Sites
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---- Financial Assurance Information
EPA WATCH LIST ---- EPA WATCH LIST
2020 COR ACTION ---- 2020 Corrective Action Program List
TSCA ---- Toxic Substances Control Act
TRIS ---- Toxic Chemical Release Inventory System
SSTS ---- Section 7 Tracking Systems
ROD ---- Records Of Decision
RMP ---- Risk Management Plans
RAATS ---- RCRA Administrative Action Tracking System
PRP ---- Potentially Responsible Parties
PADS ---- PCB Activity Database System
ICIS ---- Integrated Compliance Information System
FTTS ---- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---- Material Licensing Tracking System
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---- PCB Transformer Registration Database
RADINFO ---- Radiation Information Database
HIST FTTS ---- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---- Incident and Accident Data
CONSENT ---- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---- Indian Reservations
FUSRAP ---- Formerly Utilized Sites Remedial Action Program
UMTRA ---- Uranium Mill Tailings Sites

LEAD SMELTERS ---- Lead Smelter Sites
US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File
FINDS ---- Facility Index System/Facility Registry System
CA BOND EXP. PLAN ---- Bond Expenditure Plan
Cortese ---- "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings ---- CUPA Resources List
DRYCLEANERS ---- Cleaner Facilities
EMI ---- Emissions Inventory Data
ENF ---- Enforcement Action Listing
Financial Assurance ---- Financial Assurance Information Listing
HAZNET ---- Facility and Manifest Data
HIST CORTESE ---- Hazardous Waste & Substance Site List
HWP ---- EnviroStor Permitted Facilities Listing
HWT ---- Registered Hazardous Waste Transporter Database
MINES ---- Mines Site Location Listing
MWMP ---- Medical Waste Management Program Listing
NPDES ---- NPDES Permits Listing
PEST LIC ---- Pesticide Regulation Licenses Listing
PROC ---- Certified Processors Database
Notify 65 ---- Proposition 65 Records
UIC ---- UIC Listing
WASTEWATER PITS ---- Oil Wastewater Pits Listing
WDS ---- Waste Discharge System
WIP ---- Well Investigation Program Case List
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
ECHO ---- Enforcement & Compliance History Information

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants
EDR Hist Cleaner ---- EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---- Recovered Government Archive Solid Waste Facilities List
RGA LUST ---- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 06/09/2015 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
E Z PRODUCTS	***17999 COLLIER AVE***	***ENE 0 - 1/8 (0.035 mi.)***	***1***	***8***

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 12/14/2015 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MBC CONSTRUCTORS LTD Facility Id: 455	29400 ENTERPRISE WY	SE 1/8 - 1/4 (0.222 mi.)	B5	17

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 12/14/2015 has revealed that there is 1 SWRCY site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CANS PLUS RECYCLING Cert Id: RC5256	***29170 RIVERSIDE DR U***	***NE 0 - 1/8 (0.122 mi.)***	***A2***	***12***

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MBC CONTRUCTION LTD	***29400 INDUSTRIAL CEN***	***SE 1/8 - 1/4 (0.220 mi.)***	***B4***	***16***
Status: A Tank Status: A Comp Number: 34795				

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MBC CONTRUCTION LTD	***29400 INDUSTRIAL CEN***	***SE 1/8 - 1/4 (0.220 mi.)***	***B4***	***16***
Facility Id: 33007000 Status: A				

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there is 1 EDR Hist Auto site within approximately 0.125 miles of the target property.

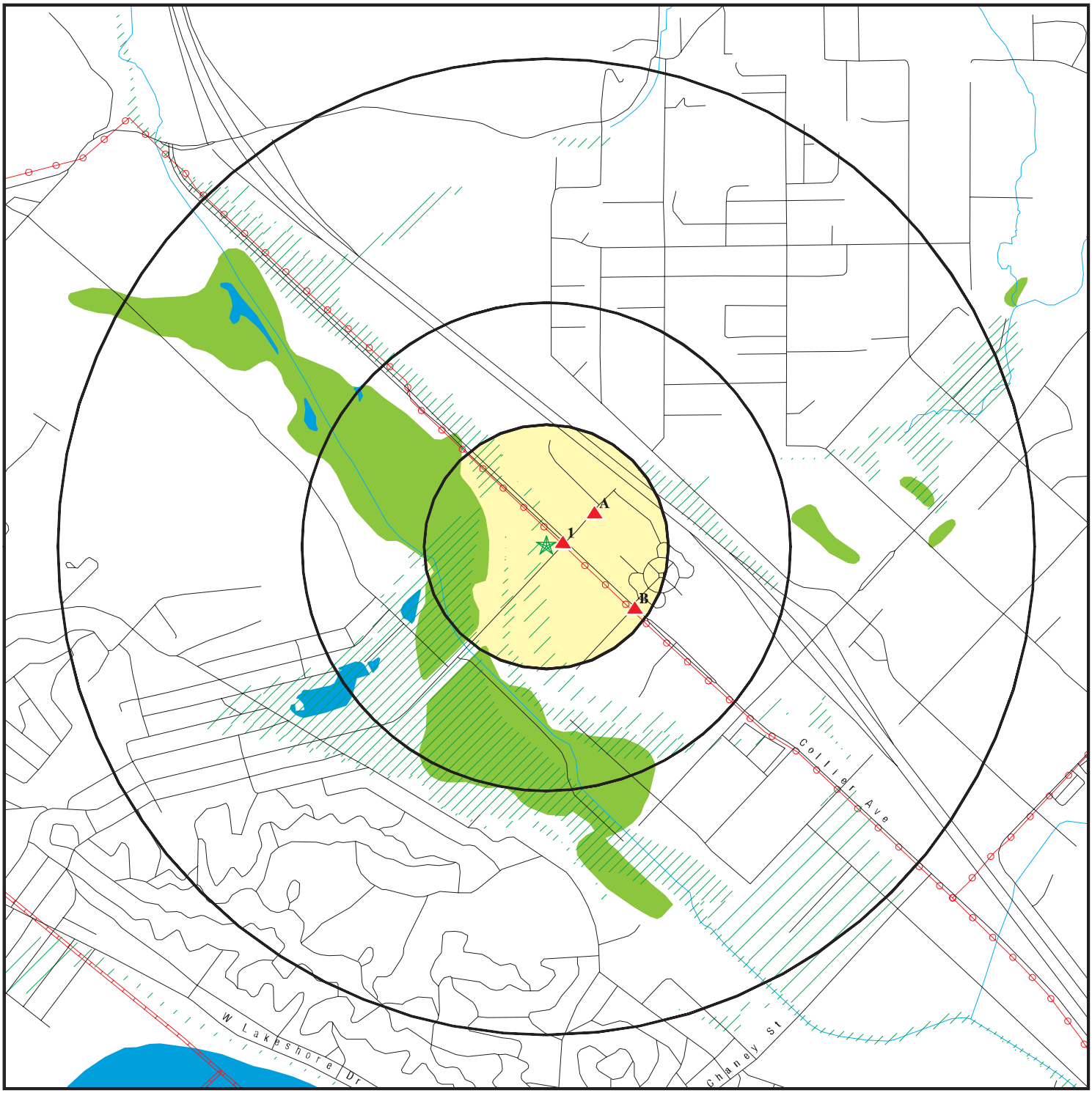
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	29170 RIVERSIDE DR	NE 0 - 1/8 (0.122 mi.)	A3	15

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 5 records.

Site Name	Database(s)
LAKE ELSINORE SQUARE	NPDES
PAC BELL	SWEEPS UST
	CDL
LOS PINOS CONSERVATION CAMP	UST
SO CAL GAS/ELSINORE MGP	ENVIROSTOR, VCP

OVERVIEW MAP - 4552616.2S



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: E-1604 Lake Elsinore ADDRESS: Collier Avenue Lake Elsinore CA 92530 LAT/LONG: 33.69492 / 117.346894	CLIENT: Geo Rox Engineering CONTACT: Alex INQUIRY #: 4552616.2s DATE: March 02, 2016 2:01 pm

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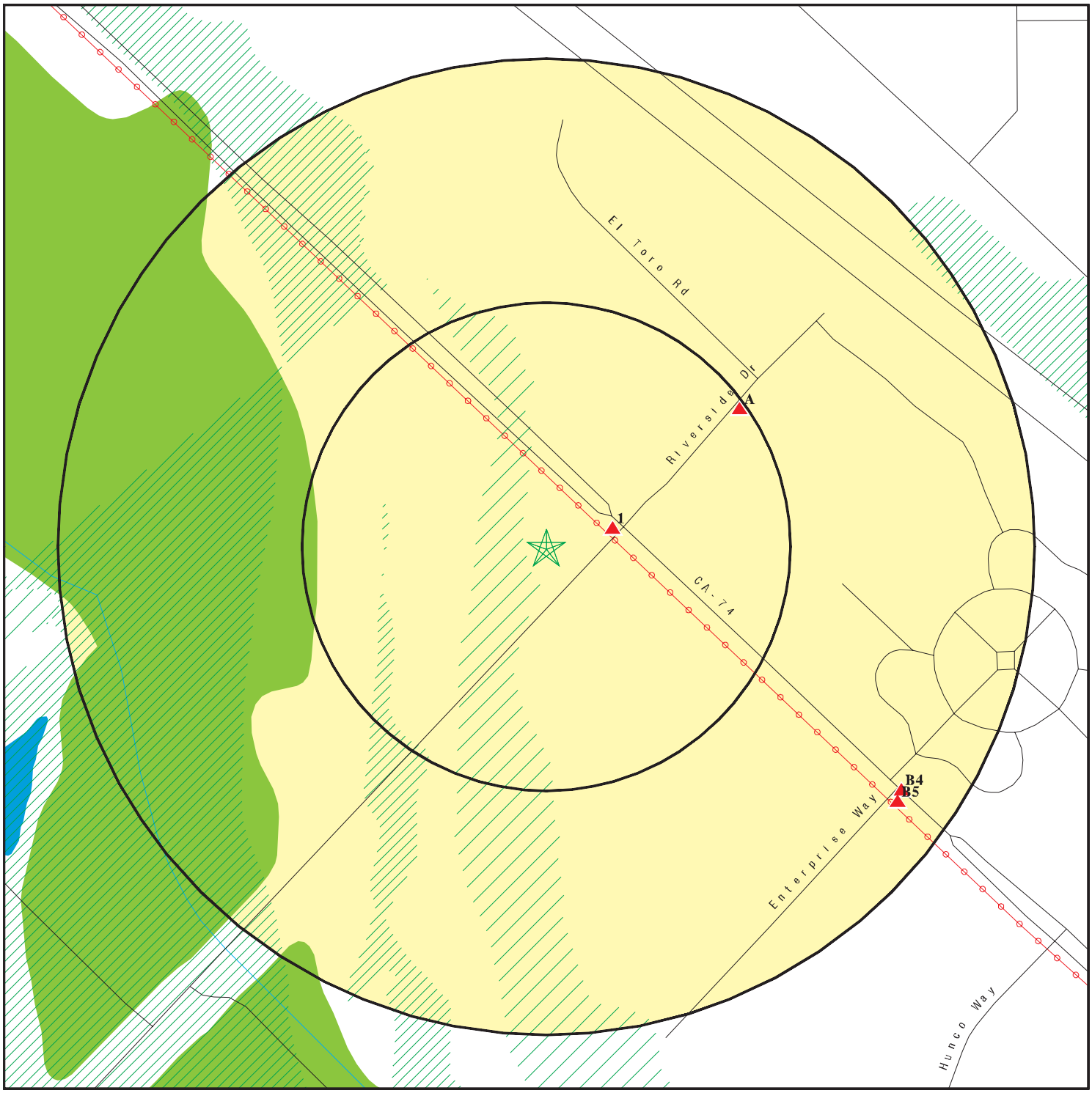
DETAIL MAP - 4552616.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

0 1/16 1/8 1/4 Miles

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: E-1604 Lake Elsinore ADDRESS: Collier Avenue Lake Elsinore CA 92530 LAT/LONG: 33.69492 / 117.346894	CLIENT: Geo Rox Engineering CONTACT: Alex INQUIRY #: 4552616.2s DATE: March 02, 2016 2:02 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
CERCLIS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERCLIS-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		1	0	NR	NR	NR	1
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	1	NR	NR	NR	1
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		1	0	0	NR	NR	1
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	1	NR	NR	NR	1
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	TP		NR	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		1	NR	NR	NR	NR	1
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	3	3	0	0	0	6

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
ENE
< 1/8
0.035 mi.
187 ft.

E Z PRODUCTS
17999 COLLIER AVE
LAKE ELSINORE, CA 92530

RCRA-SQG
FINDS
ECHO

1000128777
CAD981615784

Relative:
Higher

Actual:
1271 ft.

RCRA-SQG:

Date form received by agency:	04/17/2000
Facility name:	E Z PRODUCTS
Facility address:	17999 COLLIER AVE LAKE ELSINORE, CA 92530
EPA ID:	CAD981615784
Contact:	MITCH NELSON
Contact address:	17999 COLLIER AVE LAKE ELSINORE, CA 92530
Contact country:	US
Contact telephone:	(909) 674-7781
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	E Z PRODUCTS CO
Owner/operator address:	17999 COLLIER AVE LAKE ELSINORE, CA 92530
Owner/operator country:	Not reported
Owner/operator telephone:	(909) 674-7781
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No

E Z PRODUCTS (Continued) **1000128777**

User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D000
. Waste name: Not Defined

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

Historical Generators:
Date form received by agency: 09/01/1996
Site name: E Z PRODUCTS
Classification: Small Quantity Generator

Violation Status: No violations found

FINDS:

Registry ID: 110002725141

Environmental Interest/Information System
California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:

Envid:	1000128777
Registry ID:	110002725141
FIPS Code:	06065
EPA Region:	09
Indian Country Flag:	N
Federal Flag:	Not reported
US Mexico Border Flag:	N
Chesapeake Bay Flag:	Not reported
NAA Flag:	Y
Latitude:	33.69529
Longitude:	-117.34766
Map Icon:	RCRA-IC-MN-N.png
Collection Method:	ADDRESS MATCHING-HOUSE NUMBER
Reference Point:	CENTER OF A FACILITY OR STATION
Accuracy Meters:	30
Derived Tribes:	Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation, California - 21.4 mile(s), Soboba Band of Luiseno Indians, California - 24.8 mile(s)
Derived Huc:	18070203

E Z PRODUCTS (Continued) **1000128777**

Derived WBD:	Not reported
Derived STCT FPS:	06065
Derived Zip:	92530
Derived CD113:	42
Derived CB2010:	060650430052017
Percent Minority:	64.572
Pop Den:	1539.76
Major Flag:	Not reported
Active Flag:	Y
MYRTK Universe:	NNN
Inspection Count:	0
Date Last Inspection:	Not reported
Days Last Inspection:	Not reported
Informal Count:	0
Date Last Informal Action:	Not reported
Formal Action Count:	0
Date Last Formal Action:	Not reported
Total Penalties:	0
Penalty Count:	0
Date Last Penalty:	Not reported
Last Penalty Amount:	Not reported
QTRS in NC:	0
Programs in SNC:	0
Curr Compliance Status:	No Violation
Curr SNC Flag:	N
3yr Compliance Status:	_____
AFS Flag:	N
NPDES Flag:	N
SDWIS Flag:	N
RCRA Flag:	Y
TRI Flag:	N
GHG Flag:	N
AFS IDS:	Not reported
CAA Permit Types:	Not reported
CAA NAICS:	Not reported
CAA SICS:	Not reported
CAA Evaluation Count:	Not reported
CAA Days Last Evaluation:	Not reported
CAA Informal Count:	Not reported
CAA Formal Action Count:	Not reported
CAA Date Last Formal Action:	Not reported
CAA Penalties:	Not reported
CAA Last Penality Date:	Not reported
CAA Last Penality Amount:	Not reported
CAA Qtrs in NC:	Not reported
CAA Curr Compliance Status:	Not reported
CAA Curr HPV Flag:	N
CAA 3yr Compl Qtrs Status:	Not reported
NPDES IDS:	Not reported
CWA Permit Types:	Not reported
CWA Compliance Tracking:	Not reported
CWA NAICS:	Not reported
CWA SICS:	Not reported
CWA Inspection Count:	Not reported
CWA Days Last Inspection:	Not reported
CWA Informal Count:	Not reported
CWA Formal Action Count:	Not reported

E Z PRODUCTS (Continued) **1000128777**

CWA Date Last Formal Action:	Not reported
CWA Penalties:	Not reported
CWA Last Penality Date:	Not reported
CWA Last Penality Amount:	Not reported
CWA Qtrs in NC:	Not reported
CWA Curr Compliance Status:	Not reported
CWA Curr SNC Flag:	N
CWA 13QTRS Compl Status:	Not reported
CWA 13QTRS EFFLNT Exceedances:	Not reported
CWA 3tr QNCR Codes:	Not reported
RCRA IDS:	CAD981615784
RCRA Permit Types:	SQG
RCRA NAICS:	Not reported
RCRA Inspection Count:	Not reported
RCRA Days Last Evaluation:	Not reported
RCRA Informal Count:	Not reported
RCRA Formal Action Count:	Not reported
RCRA Date Last Formal Action:	Not reported
RCRA Penalties:	Not reported
RCRA Last Penality Date:	Not reported
RCRA Last Penality Amount:	Not reported
RCRA QTRS in NC:	0
RCRA Curr Compliance Status:	No Violation
RCRA Curr SNC Flag:	N
RCRA 3yr Compl Qtrs Status:	_____
SDWA IDS:	Not reported
SDWA System Types:	Not reported
SDWA Informal Count:	Not reported
SDWA Formal Action Count:	Not reported
SDWA Curr Compliance Status:	Not reported
SDWA Curr SNC Flag:	N
TRI IDS:	Not reported
TRI Releases Transfers:	Not reported
TRI on Site Releases:	Not reported
Tri off Site Transfers:	Not reported
TRI Reporter in Past:	Not reported
FEC Case IDS:	Not reported
FEC Number of Cases:	Not reported
FEC Last Case Date:	Not reported
FEC Total Penalties:	Not reported
GHG IDS:	Not reported
GHG CO2 Release:	Not reported
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110002725141
Facility SIC Codes:	Not reported
Facility NAICS Codes:	Not reported
Facility Date Last Inspection EPA:	Not reported
Facility Date Last Inspection State:	Not reported
Facility Date Last Formal ACT EPA:	Not reported
Facility Date Last Formal ACT ST:	Not reported
Facility Date Last Inforamal ACT EPA:	Not reported
Facility Date Last Informal ACT ST:	Not reported
Facility Federal Agency:	Not reported
TRI Reporter:	Not reported
Facility IMP Water Flag:	Not reported

A2
NE
< 1/8
0.122 mi.
643 ft.

CANS PLUS RECYCLING
29170 RIVERSIDE DR UNIT 1
LAKE ELSINORE, CA 92530

Site 1 of 2 in cluster A

SWRCY S110656511
NPDES N/A

Relative:
Higher

Actual:
1278 ft.

SWRCY:

Reg Id:	18819
Cert Id:	RC5256
Mailing Address:	29170 Riverside Dr Unit 1
Mailing City:	Lake Elsinore
Mailing State:	CA
Mailing Zip Code:	92530
Website:	Not reported
Email:	Not reported
Phone Number:	Not reported
Grand Father:	N
Rural:	N
Operation Begin Date:	03/24/1993
Aluminium:	Y
Glass:	Y
Plastic:	Y
Bimetal:	Y
Agency:	N/A
Monday Hours Of Operation:	8:30 am - 4:45 pm
Tuesday Hours Of Operation:	8:30 am - 4:45 pm
Wednesday Hours Of Operation:	8:30 am - 4:45 pm
Thursday Hours Of Operation:	8:30 am - 4:45 pm
Friday Hours Of Operation:	8:30 am - 4:45 pm
Saturday Hours Of Operation:	9:00 am - 2:45 pm
Sunday Hours Of Operation:	CLOSED
Organization ID:	18819
Organization Name:	Cans Plus Recycling

NPDES:

Npdes Number:	CAS000001
Facility Status:	Active
Agency Id:	0
Region:	8
Regulatory Measure Id:	445159
Order No:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	8 33I024750
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	03/24/2014
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Cans Plus Recycling
Discharge Address:	29170 Riverside Drive Unit 1
Discharge City:	Lake Elsinore
Discharge State:	California
Discharge Zip:	92530
RECEIVED DATE:	Not reported
PROCESSED DATE:	Not reported
STATUS CODE NAME:	Not reported
STATUS DATE:	Not reported
PLACE SIZE:	Not reported

CANS PLUS RECYCLING (Continued) **S110656511**

PLACE SIZE UNIT:	Not reported
FACILITY CONTACT NAME:	Not reported
FACILITY CONTACT TITLE:	Not reported
FACILITY CONTACT PHONE:	Not reported
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	Not reported
OPERATOR NAME:	Not reported
OPERATOR ADDRESS:	Not reported
OPERATOR CITY:	Not reported
OPERATOR STATE:	Not reported
OPERATOR ZIP:	Not reported
OPERATOR CONTACT NAME:	Not reported
OPERATOR CONTACT TITLE:	Not reported
OPERATOR CONTACT PHONE:	Not reported
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	Not reported
OPERATOR TYPE:	Not reported
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	Not reported
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	Not reported
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported
CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	Not reported
RECEIVING WATER NAME:	Not reported
CERTIFIER NAME:	Not reported
CERTIFIER TITLE:	Not reported
CERTIFICATION DATE:	Not reported
PRIMARY SIC:	Not reported
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported
Npdes Number:	Not reported
Facility Status:	Not reported
Agency Id:	Not reported
Region:	8
Regulatory Measure Id:	445159

CANS PLUS RECYCLING (Continued) **S110656511**

Order No:	Not reported
Regulatory Measure Type:	Industrial
Place Id:	Not reported
WDID:	8 33I024750
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
RECEIVED DATE:	3/24/2014
PROCESSED DATE:	3/24/2014
STATUS CODE NAME:	Active
STATUS DATE:	3/24/2014
PLACE SIZE:	16700
PLACE SIZE UNIT:	SqFt
FACILITY CONTACT NAME:	Larry Amsbry
FACILITY CONTACT TITLE:	Owner
FACILITY CONTACT PHONE:	951-245-1178
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	cansplusrecycling@yahoo.com
OPERATOR NAME:	Cans Plus Recycling
OPERATOR ADDRESS:	29170 Riverside Drive Unit 1
OPERATOR CITY:	Lake Elsinore
OPERATOR STATE:	California
OPERATOR ZIP:	92530
OPERATOR CONTACT NAME:	Robert Amsbry
OPERATOR CONTACT TITLE:	Manager
OPERATOR CONTACT PHONE:	951-245-1178
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	cansplusrecycling@yahoo.com
OPERATOR TYPE:	Private Business
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	California
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	Not reported
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported

CANS PLUS RECYCLING (Continued) **S110656511**

CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	N
RECEIVING WATER NAME:	Lake Elsinore
CERTIFIER NAME:	Robert Amsbry
CERTIFIER TITLE:	Manager
CERTIFICATION DATE:	30-JAN-15
PRIMARY SIC:	5093-Scrap and Waste Materials
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported

A3 **EDR Hist Auto** **1015393886**
NE **29170 RIVERSIDE DR** **N/A**
< 1/8 **LAKE ELSINORE, CA 92530**
0.122 mi.
643 ft. **Site 2 of 2 in cluster A**

Relative:
Higher

Actual:
1278 ft.

EDR Historical Auto Stations:

Name:	LEOS AUTO BODY
Year:	1999
Address:	29170 RIVERSIDE DR
Name:	LEOS AUTO BODY
Year:	2000
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2007
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2008
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2009
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2010
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2011
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2012
Address:	29170 RIVERSIDE DR

B4 **MBC CONTRUCTION LTD** **SWEEPS UST** **S101590309**
SE **29400 INDUSTRIAL CENTER WAY** **CA FID UST** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92330**
0.220 mi.
1163 ft. **Site 1 of 2 in cluster B**

Relative:
Higher

Actual:
1278 ft.

SWEEPS UST:

Status:	Active
Comp Number:	34795
Number:	1
Board Of Equalization:	44-018185
Referral Date:	11-17-92
Action Date:	11-17-92
Created Date:	03-09-89
Owner Tank Id:	001190
SWRCB Tank Id:	33-000-034795-000001
Tank Status:	A
Capacity:	4000
Active Date:	11-17-92
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	2

Status:	Active
Comp Number:	34795
Number:	1
Board Of Equalization:	44-018185
Referral Date:	11-17-92
Action Date:	11-17-92
Created Date:	03-09-89
Owner Tank Id:	001190
SWRCB Tank Id:	33-000-034795-000002
Tank Status:	A
Capacity:	8000
Active Date:	11-17-92
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	Not reported

CA FID UST:

Facility ID:	33007000
Regulated By:	UTNKA
Regulated ID:	Not reported
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	7146748787
Mail To:	Not reported
Mailing Address:	29400 INDUSTRIAL CENTER WAY
Mailing Address 2:	Not reported
Mailing City,St,Zip:	LAKE ELSINORE 92330
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

B5 **MBC CONSTRUCTORS LTD** **UST** **U003739355**
SE **29400 ENTERPRISE WY** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92530**
0.222 mi.
1172 ft. **Site 2 of 2 in cluster B**

Relative:
Higher

Actual:
1277 ft.

UST:

Facility ID:	455
Permitting Agency:	RIVERSIDE COUNTY
Latitude:	33.6920974
Longitude:	-117.3447503

Count: 5 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
DANBY	S106930254	PAC BELL	25 MILES E OF AMBOY HWY 66	92532	SWEEPS UST
ELSINORE	S100714908	SO CAL GAS/ELSINORE MGP	CNR RILEY, FLINT, SPRING & POT	92530	ENVIROSTOR, VCP
LAKE ELSINORE	S107535310		609 COLLIER AVENUE	92350	CDL
LAKE ELSINORE	S117703449	LAKE ELSINORE SQUARE	NEC OF COLLIER AVE & CENTRAL A	92530	NPDES
LAKE ELSINORE	U004050576	LOS PINOS CONSERVATION CAMP	32951 ORTEGA HWY	92530	UST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 03/26/2015
Date Data Arrived at EDR: 04/08/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/06/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2015
Date Data Arrived at EDR: 05/29/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 13

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 06/22/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/29/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 11/18/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 64

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/17/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 11/04/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/08/2015
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 02/09/2015
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 03/30/2015
Date Data Arrived at EDR: 04/28/2015
Date Made Active in Reports: 06/22/2015
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 08/20/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 111

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 34

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/27/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

UST: Active UST Facilities

Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities

A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 08/20/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 111

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/05/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 34

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 12/14/2014
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 28

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/28/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 12/04/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/22/2015
Date Data Arrived at EDR: 12/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/21/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 58

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/14/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/17/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 76
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs
A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 8
Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/17/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 76

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 11/25/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 16

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 12/17/2015
Date Data Arrived at EDR: 12/22/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/08/2015
Next Scheduled EDR Contact: 12/21/2015
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/02/2015
Number of Days to Update: 68

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/30/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 09/25/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 11/16/2015
Number of Days to Update: 20

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/11/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/01/2015
Date Data Arrived at EDR: 09/03/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/09/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/12/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/12/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 110

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/11/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2015
Date Data Arrived at EDR: 08/26/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 02/12/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 33

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/12/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/26/2015
Date Data Arrived at EDR: 07/10/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 95
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/13/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/11/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/29/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/07/2015
Date Data Arrived at EDR: 07/09/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/07/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 46

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/26/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 86

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 12/22/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 12/22/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2015
Date Data Arrived at EDR: 09/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 125

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/03/2015
Next Scheduled EDR Contact: 03/14/2016
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/14/2016
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/14/2016
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/20/2015
Date Data Arrived at EDR: 09/09/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 55

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/10/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/28/2015
Date Data Arrived at EDR: 12/29/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 23

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/29/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/10/2015
Date Data Arrived at EDR: 08/27/2015
Date Made Active in Reports: 10/01/2015
Number of Days to Update: 35

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 02/05/2016
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 09/25/2015
Date Made Active in Reports: 11/05/2015
Number of Days to Update: 41

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 59

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 59

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 10/14/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 58

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/13/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 01/13/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Varies

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 11/10/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/08/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 11/18/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/17/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 12/08/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 03/01/2016
Number of Days to Update: 75

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 01/05/2016
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 38

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 07/23/2015
Date Data Arrived at EDR: 09/15/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 28

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing

Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/16/2016
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 86

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/20/2015
Date Data Arrived at EDR: 09/23/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 103

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 12/21/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/12/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 41

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/14/2016
Date Made Active in Reports: 03/01/2016
Number of Days to Update: 47

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 12/10/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 42

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 11/20/2014
Date Data Arrived at EDR: 11/24/2014
Date Made Active in Reports: 01/07/2015
Number of Days to Update: 44

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing

Cupa Facility Listing

Date of Government Version: 02/02/2016
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 18

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/28/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/08/2015
Date Data Arrived at EDR: 09/22/2015
Date Made Active in Reports: 10/14/2015
Number of Days to Update: 22

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 12/01/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 48

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 11/17/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 24

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/30/2015
Date Data Arrived at EDR: 12/03/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 49

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 01/05/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 45

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 01/04/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 12/02/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 48

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 26

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 05/19/2015
Date Data Arrived at EDR: 06/18/2015
Date Made Active in Reports: 07/22/2015
Number of Days to Update: 34

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/19/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 18

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2016
Date Data Arrived at EDR: 01/26/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 27

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 11/24/2014
Date Data Arrived at EDR: 01/30/2015
Date Made Active in Reports: 03/04/2015
Number of Days to Update: 33

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/19/2015
Date Data Arrived at EDR: 10/20/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 30

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/20/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2015
Date Data Arrived at EDR: 07/27/2015
Date Made Active in Reports: 08/10/2015
Number of Days to Update: 14

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/15/2015
Date Data Arrived at EDR: 01/29/2015
Date Made Active in Reports: 03/10/2015
Number of Days to Update: 40

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 03/30/2015
Date Data Arrived at EDR: 04/02/2015
Date Made Active in Reports: 04/13/2015
Number of Days to Update: 11

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 11/04/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/12/2016
Date Data Arrived at EDR: 01/15/2016
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 24

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 09/15/2015
Date Data Arrived at EDR: 09/17/2015
Date Made Active in Reports: 10/14/2015
Number of Days to Update: 27

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 10/05/2015
Date Data Arrived at EDR: 10/08/2015
Date Made Active in Reports: 10/15/2015
Number of Days to Update: 7

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/18/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 34

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 51

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 12/10/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 60

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 01/27/2016
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 18

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 11/01/2015
Date Data Arrived at EDR: 11/17/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 65

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/09/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 08/03/2015
Date Data Arrived at EDR: 08/10/2015
Date Made Active in Reports: 09/11/2015
Number of Days to Update: 32

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/09/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/01/2015
Date Data Arrived at EDR: 11/11/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 36

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/10/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 12/11/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 41

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/26/2015
Date Data Arrived at EDR: 10/28/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 22

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/26/2015
Date Data Arrived at EDR: 10/28/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 22

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List

List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 01/05/2016
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 38

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 01/05/2016
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 38

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/18/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 52

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 12/18/2015
Date Data Arrived at EDR: 12/22/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 48
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/10/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 42
Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/21/2016
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 10/14/2015
Date Data Arrived at EDR: 10/15/2015
Date Made Active in Reports: 11/16/2015
Number of Days to Update: 32

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Annually

Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/10/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing

CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List

Cupa facility list

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 17

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/17/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 59

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 18

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 12/10/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 42

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 09/10/2015
Next Scheduled EDR Contact: 12/28/2015
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/10/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/14/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 39

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 01/05/2016
Date Data Arrived at EDR: 01/07/2016
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 32

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 9

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 10/29/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 42

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 08/17/2015
Date Made Active in Reports: 09/03/2015
Number of Days to Update: 17

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/30/2015
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/14/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 09/28/2015
Date Data Arrived at EDR: 10/28/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 22

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 11/30/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 10/19/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 23

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 02/01/2016
Date Data Arrived at EDR: 02/05/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 17

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/18/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/17/2015
Date Made Active in Reports: 08/12/2015
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 11/08/2015
Date Made Active in Reports: 12/09/2015
Number of Days to Update: 31

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/24/2015
Date Made Active in Reports: 08/18/2015
Number of Days to Update: 25

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 03/19/2015
Date Made Active in Reports: 04/07/2015
Number of Days to Update: 19

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/09/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

E-1604 LAKE ELSINORE
COLLIER AVENUE
LAKE ELSINORE, CA 92530

TARGET PROPERTY COORDINATES

Latitude (North):	33.69492 - 33° 41' 41.71''
Longitude (West):	117.346894 - 117° 20' 48.82''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	467850.2
UTM Y (Meters):	3728190.8
Elevation:	1268 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5636473 LAKE ELSINORE, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

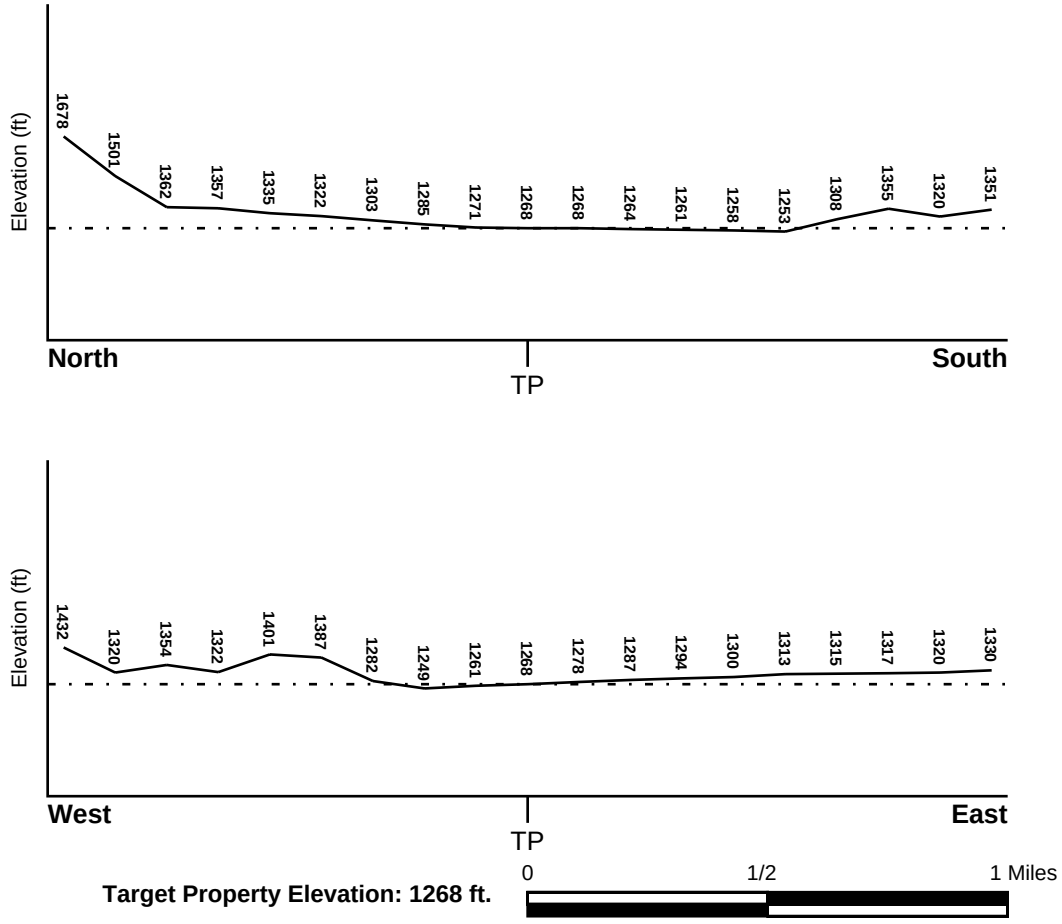
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1268 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
RIVERSIDE, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: 06065C - FEMA DFIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

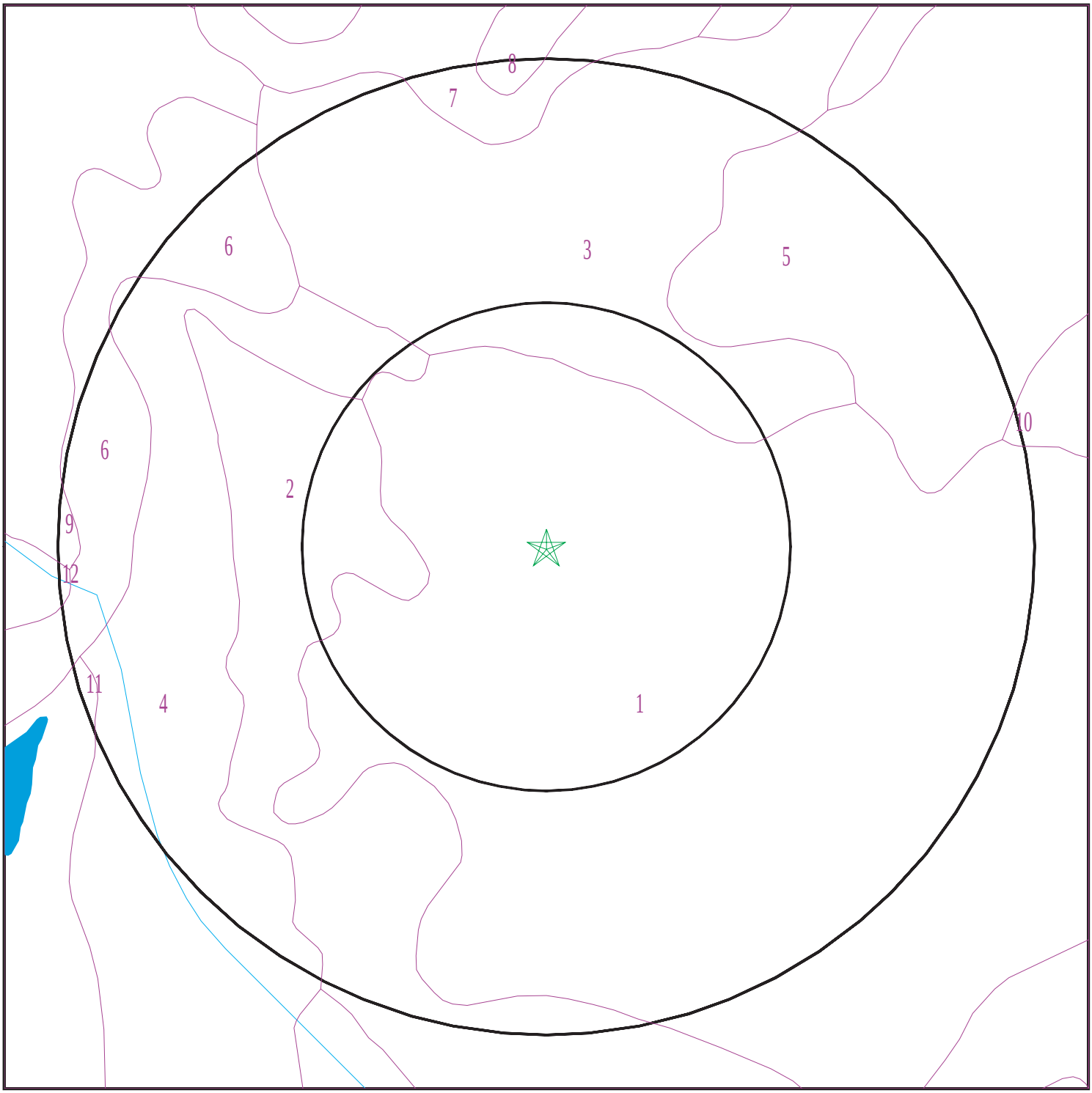
Era:	Mesozoic
System:	Lower Jurassic and Upper Triassic
Series:	Lower Mesozoic
Code:	lMze *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 4552616.2s



SITE NAME:	E-1604 Lake Elsinore	CLIENT:	Geo Rox Engineering
ADDRESS:	Collier Avenue	CONTACT:	Alex
	Lake Elsinore CA 92530	INQUIRY #:	4552616.2s
LAT/LONG:	33.69492 / 117.346894	DATE:	March 02, 2016 2:03 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: GARRETSON

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	59 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.8 Min: 6.1

Soil Map ID: 2

Soil Component Name: PACHAPPA

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.8 Min: 6.1
2	20 inches	62 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.6

Soil Map ID: 3

Soil Component Name: GARRETSON

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	59 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.1

Soil Map ID: 4

Soil Component Name: TRAVER

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 9 Min: 7.4
2	12 inches	38 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4
3	38 inches	59 inches	stratified fine sandy loam to silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4

Soil Map ID: 5

Soil Component Name: ARBUCKLE

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	11 inches	25 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	25 inches	44 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
4	44 inches	68 inches	stratified sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 6

Soil Component Name: TRAVER

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 9 Min: 7.4
2	12 inches	38 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4
3	38 inches	59 inches	stratified fine sandy loam to silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4

Soil Map ID: 7

Soil Component Name: ARBUCKLE

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	25 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	25 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	44 inches	68 inches	stratified very gravelly sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 8

Soil Component Name: ARBUCKLE

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	25 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	25 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	44 inches	68 inches	stratified very gravelly sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 9

Soil Component Name: WILLOWS

Soil Surface Texture: silty clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.42 Min: 0.01	Max: 9 Min: 7.4
2	9 inches	59 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.42 Min: 0.01	Max: 9 Min: 8.5

Soil Map ID: 10

Soil Component Name: ARBUCKLE

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 5.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	25 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	25 inches	44 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
4	44 inches	68 inches	stratified sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 11

Soil Component Name: TRAVER

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 9 Min: 7.4
2	20 inches	59 inches	stratified fine sandy loam to silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4

Soil Map ID: 12

Soil Component Name: ALTAMONT

Soil Surface Texture: cobbly clay

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	cobbly clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 7.8 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	18 inches	22 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
3	22 inches	27 inches	weathered bedrock	Not reported	Not reported	Max: 4 Min: 1.4	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

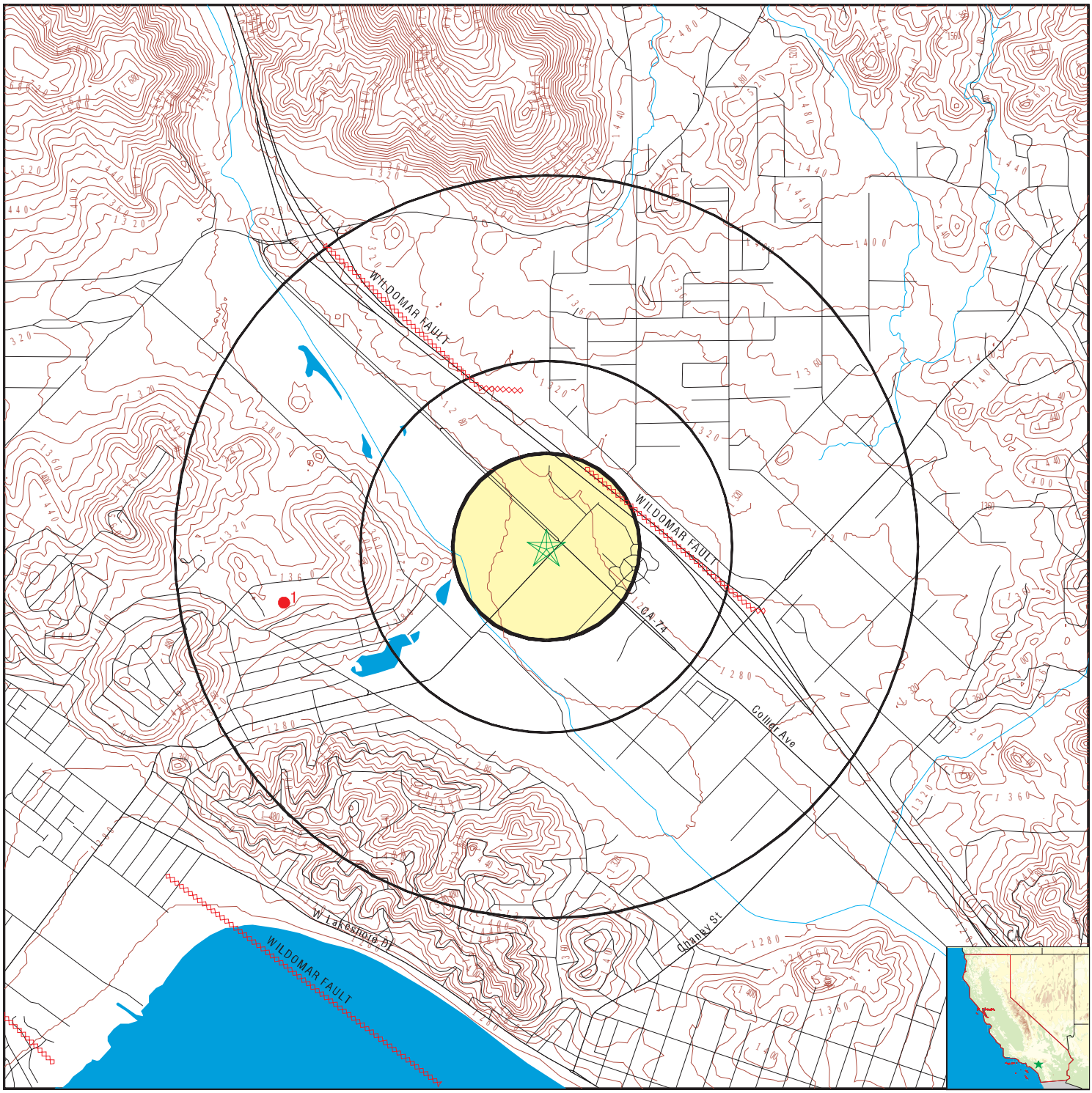
MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CAOG11000222706	1/2 - 1 Mile WSW

PHYSICAL SETTING SOURCE MAP - 4552616.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME: E-1604 Lake Elsinore	CLIENT: Geo Rox Engineering
ADDRESS: Collier Avenue Lake Elsinore CA 92530	CONTACT: Alex
LAT/LONG: 33.69492 / 117.346894	INQUIRY #: 4552616.2s DATE: March 02, 2016 2:03 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1
WSW **OIL_GAS** **CAOG11000222706**
1/2 - 1 Mile

District nun:	1	Api number:	06500093
Blm well:	N	Redrill can:	Not Reported
Dryhole:	Y	Well status:	P
Operator name:	Great Coastal Oil Corp.		
County name:	Riverside	Fieldname:	Any Field
Area name:	Any Area	Section:	36
Township:	05S	Range:	05W
Base meridian:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Not Reported	Wellnumber:	1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	Not Reported
Welldeptha:	0		
Redrillfoo:	0		
Abandonedd:	Not Reported	Completion:	Not Reported
Directiona:	Unknown	Gissymbol:	PDH
Site id:	CAOG11000222706		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92530	6	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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Fax To: Geo Rox Engineering
Contact: Alex
Fax : 949-533-9059
Date: 03/02/2016

Fax From: Robert Glaze
EDR
Phone: 1-800-352-0050

EDR PUR-IQ® Report

"the intelligent way to conduct historical research"

for
E-1604 Lake Elsinore
Collier Avenue
Lake Elsinore, CA 92530
Lat./Long. 33.69492 / 117.346894
EDR Inquiry # 4552616.2s

The EDR PUR-IQ report facilitates historical research planning required to complete the Phase I ESA process. The report identifies the *likelihood* of prior use coverage by searching proprietary EDR-Prior Use Reports® comprising nationwide information on: city directories, fire insurance maps, aerial photographs, historical topographic maps, flood maps and National Wetland Inventory maps.

Potential for EDR Historical (Prior Use) Coverage - Coverage in the following historical information sources may be used as a guide to develop your historical research strategy:

1. City Directory: Coverage may exist for portions of Riverside County, CA.

2. Fire Insurance Map: When you order online any EDR Package or the EDR Radius Map with EDR Sanborn Map Search/Print, you receive site specific Sanborn Map coverage information at no charge.

3. Aerial Photograph: Coverage exists for portions of Riverside County for the following decades: 1930s, 1980s, 1960s, 1950s, 1990s Shipping time 3-5 business days.

4. Topographic Map: The USGS 7.5 min. quad topo sheet(s) associated with this site:

Historical: Coverage exists for RIVERSIDE County

Current: Target Property: TP | 2012 | 5636473 Lake Elsinore, CA

5. Flood Insurance Rate Maps (FEMA) : Coverage is available for RIVERSIDE county.

EDR's network of professional researchers, located throughout the United States, accesses the most extensive national collections of city directory, fire insurance maps, aerial photographs, flood maps and historical topographic map resources available for Lake Elsinore, CA. These collections may be located in multiple libraries throughout the country. To ensure maximum coverage, EDR will often assign researchers at these multiple locations on your behalf. Please call or fax your EDR representative to authorize a search.

EDR - HISTORICAL SOURCE(S) ORDER FORM

Geo Rox Engineering
Alex
Account # 7013183

E-1604 Lake Elsinore
Collier Avenue
Lake Elsinore, CA 92530
RIVERSIDE County
Lat./Long. 33.69492 / 117.346894
EDR Inquiry # 4552616.2s

Should you wish to change or add to your order, fax this form to your EDR account executive:

Robert Glaze
Ph: 1-800-352-0050 Fax: 1-800-231-6802

Reports

___ EDR Sanborn Map® Search/Print

___ EDR Fire Insurance Map Abstract

___ EDR Multi-Tenant Retail Facility® Report

___ EDR City Directory Abstract

___ EDR Aerial Photo Decade Package

___ USGS Aerial 5 Package

___ USGS Aerial 3 Package

___ EDR Historical Topographic Maps

___ Paper Current USGS Topo (7.5 min.)

___ Environmental Lien Search

___ Chain of Title Search

___ NJ MacRaes Industrial Directory Report

___ EDR Telephone Interview

Shipping:

___ Email
___ Express, Next Day Delivery — RUSH SERVICE IS AVAILABLE
___ Express, Second Day Delivery
___ Express, Next day Delivery — Customer Account — Acct # _____
___ Express, Second Day Delivery — Customer Account — Acct # _____
___ U.S. Mail

Thank you

APPENDIX C

THE EDR-AERIAL REPORT

Vacant Lot - Lake Elsinore
Collier Ave
Lake Elsinore, CA 92530

Inquiry Number: 4551235.5
March 01, 2016

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

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Date EDR Searched Historical Sources:

Aerial Photography March 01, 2016

Target Property:

Collier Ave

Lake Elsinore, CA 92530

Year	***Scale***	***Details***	***Source***
1938	Aerial Photograph. Scale: 1"=500'	Flight Year: 1938	USGS
1949	Aerial Photograph. Scale: 1"=500'	Flight Year: 1949	USGS
1953	Aerial Photograph. Scale: 1"=500'	Flight Year: 1953	USGS
1961	Aerial Photograph. Scale: 1"=500'	Flight Year: 1961	USGS
1967	Aerial Photograph. Scale: 1"=500'	Flight Year: 1967	USGS
1978	Aerial Photograph. Scale: 1"=500'	Flight Year: 1978	USGS
1985	Aerial Photograph. Scale: 1"=500'	Flight Year: 1985	USGS
1989	Aerial Photograph. Scale: 1"=500'	Flight Year: 1989	USGS
1990	Aerial Photograph. Scale: 1"=500'	Flight Year: 1990	USGS
1994	Aerial Photograph. Scale: 1"=500'	/DOQQ - acquisition dates: 1994	USGS/DOQQ
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	USDA/NAIP
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	USDA/NAIP
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	USDA/NAIP
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	USDA/NAIP

INQUIRY #: 4551235.5
YEAR: 1938
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1949
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1953
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1961
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1967
= 500'
N
EDR

INQUIRY #: 4551235.5

YEAR: 1978

N

EDR

= 500'

INQUIRY #: 4551235.5
YEAR: 1985
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1989
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1990
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1994
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 2005
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 2009
= 500'
N
EDR

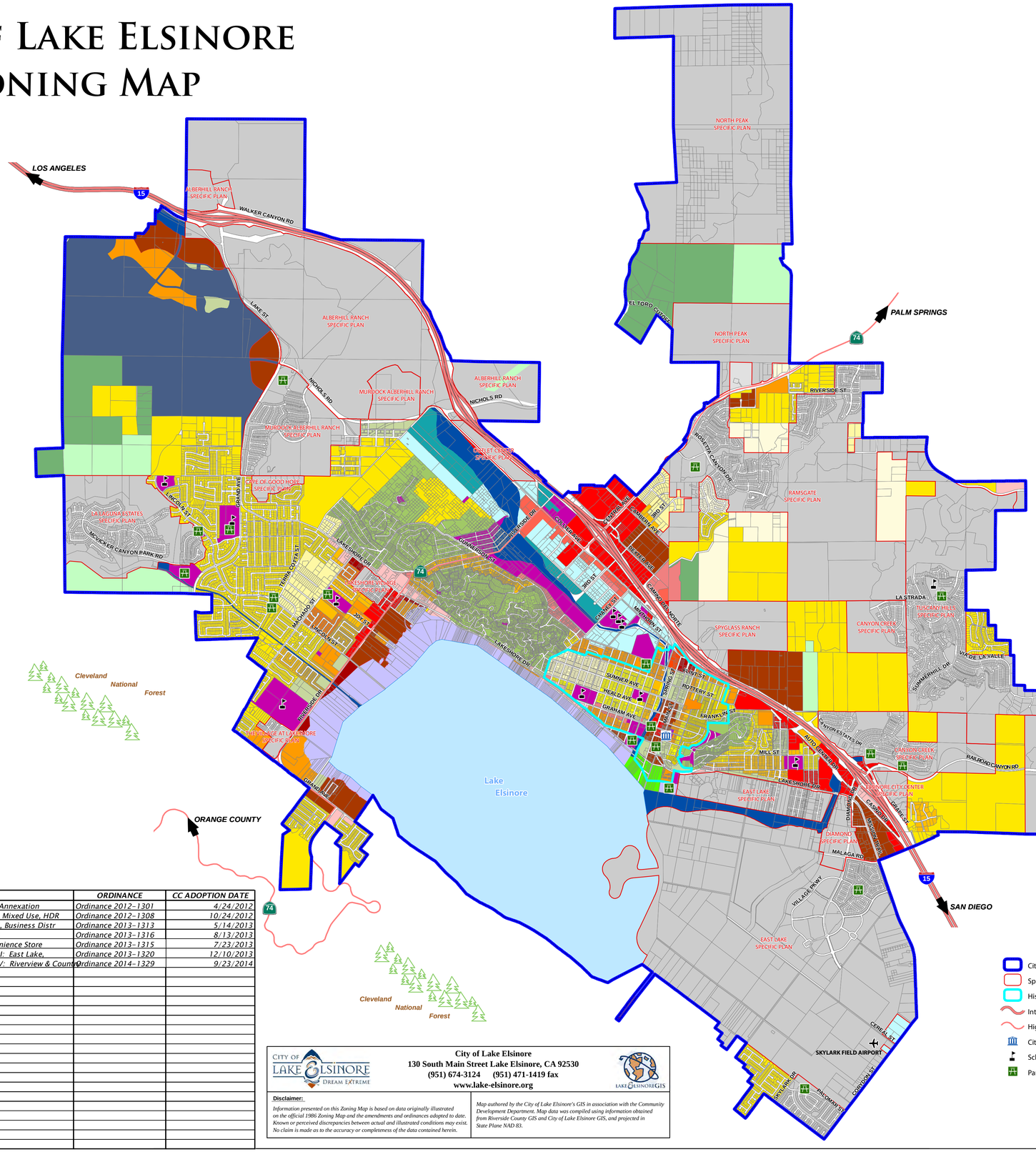
INQUIRY #: 4551235.5
YEAR: 2010
= 500'
N
EDR

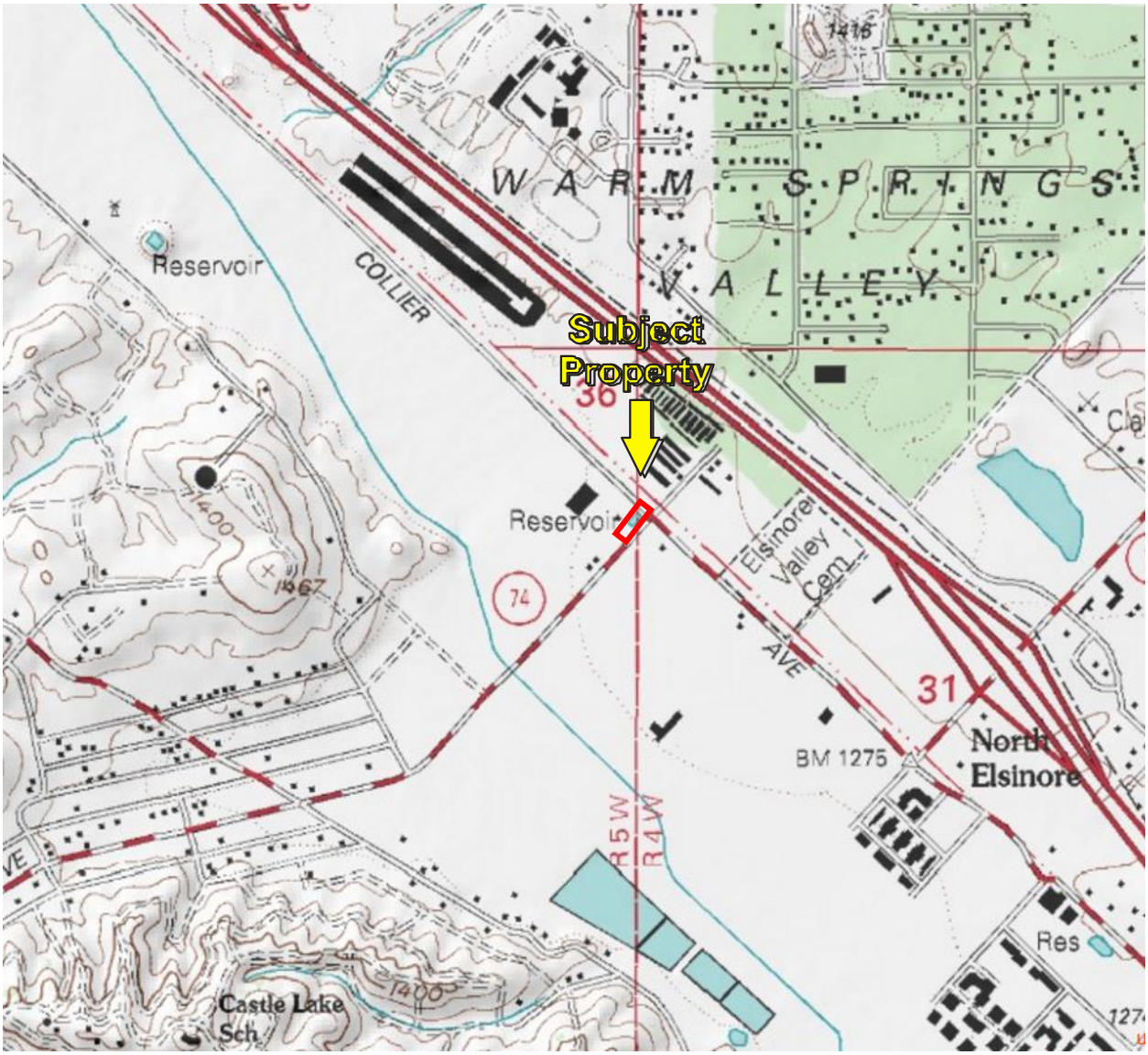
INQUIRY #: 4551235.5
YEAR: 2012
= 500'
N
EDR

APPENDIX D

SUPPORTING DOCUMENTATION

City of Lake Elsinore Zoning Map


LOS ANGELES
ORANGE COUNTY
PALM SPRINGS
SAN DIEGO
Lake Elsinore
Cleveland National Forest
Cleveland National Forest
ALBERHILL RANCH SPECIFIC PLAN
NORTH PEAK SPECIFIC PLAN
MURDOCK ALBERHILL RANCH SPECIFIC PLAN
CANYON CREEK SPECIFIC PLAN
CANYON HILLS SPECIFIC PLAN
CANYON ESTATES SPECIFIC PLAN
RAMSGATE SPECIFIC PLAN
SPYGLASS RANCH SPECIFIC PLAN
TUSCANY HILLS SPECIFIC PLAN
LA LAGUNA ESTATES SPECIFIC PLAN
CAPE OF GOOD HOPE SPECIFIC PLAN
DIAMOND SPECIFIC PLAN
EAST LAKE SPECIFIC PLAN
EAST LAKE SPECIFIC PLAN
LAKESHORE VILLAGE SPECIFIC PLAN
THE VILLAGE AT LAKESHORE SPECIFIC PLAN
ELSINORE CITY CENTER SPECIFIC PLAN
WALKER CANYON RD
NICHOLS RD
RIVERSIDE DR
RAILROAD CANYON RD
MALAGA RD
SKYLARK FIELD AIRPORT
EL TORO CUTOFF
LAKE ST
MAIN ST
GRAHAM AVE
HEALD AVE
SUMNER AVE
POTTERY ST
FRANKLIN ST
PECK ST
MILL ST
AUTO CENTER DR
LAKESHORE DR
CANYON HILLS RD
COTTONWOOD HILLS RD
VILLAGE PKWY
MCVICKER CANYON PARK RD
TERRACOTA ST
MACHADO ST
LINCOLN ST
30TH ST
3RD ST
GRAHAM AVE
RIVERSIDE DR
ROSETTA CANYON DR
RIVERSIDE DR
CANYON ESTATES DR
SUMMERHILL DR
VIA DE LA VALLE
LA STRADA
CERES AVE
CORYDON ST
PALOMAS ST
SKYLARK DR
DIAMOND DR
CASSIA ST
GRUBER ST
JEFFERSON ST
CERES AVE
CORYDON ST
MAITLEN ST
3RD ST
GRAHAM AVE
SUMMERHILL DR
VIA DE LA VALLE
CANYON ESTATES DR
RAILROAD CANYON RD
CANYON HILLS RD
COTTONWOOD HILLS RD
VILLAGE DR
CASSIA ST
GRUBER ST
DIAMOND DR
MALAGA RD
VILLAGE PKWY
CERES AVE
SKYLARK DR
CORYDON ST
POTTERY ST
FRANKLIN ST
PECK ST
MILL ST
AUTO CENTER DR
LAKESHORE DR
CANYON HILLS RD
COTTONWOOD HILLS RD
RAILROAD CANYON RD


W A R M S P R I N G S
V A L L E Y
Reservoir
COLLIER
Subject Property
36
Reservoir
1400
1367
74
Elsinore Valley Cem
AVE
31
BM 1275
North Elsinore
R5W
R4W
Res
Castle Lake Sch
1400

Wednesday, March 2, 2016

Search Again

Property Information Center

Property Information for the 2014-2015 tax year as of January 1, 2014

Property Information

Parcel Number:	378030007-0
Property Address:	29301 RIVERSIDE DR LAKE ELSINORE CA 92530
Legal Description:	Lot 5 MB 008/377 MAP SUBS IN ELSINORE
Property Type:	N/A
Assessment Description:	N/A
Year Built	0000
Square Feet:	N/A
Bedroom:	N/A
Bath:	N/A
Pool:	N
Lot Size:	2.87 Acres

Sales Information

Last Recorded Document:	11/2001
Recording Number:	0573987

Assessed Value Information

Land	460,940
Full Value	460,940
Total Net	460,940

Assessment Information

Assessment Number:	378030007-0
Tax Rate Area:	005-018
Taxability Code:	0-00
Base Year:	2002

Parcel Map

View Parcel Map

Related Property Information

City Sphere:	LAKE ELSINORE
Supervisorial District:	KEVIN JEFFRIES
Landuse Designation:	CITY
Agriculture Preserve:	NOT IN AN AGRICULTURE PRESERVE
School District:	LAKE ELSINORE UNIFIED
Water District:	WMWD
Fema Flood Plan:	FLOOD ZONE 0.2 PCT ANNUAL

Tax Assessment District

CITY OF LAKE ELSINORE ANX
COUNTY FREE LIBRARY
COUNTY STRUCTURE FIRE PROTECTION
CSA 152
ELS MURRIETA ANZA RESOURCE CONS
ELSINORE AREA ELEM SCHOOL FUND
ELSINORE VAL MUN WTR IMP DIST 1
ELSINORE VALLEY CEMETERY
ELSINORE VALLEY MUNICIPAL WATER
FLOOD CONTROL ADMINISTRATION
FLOOD CONTROL ZONE 3
GENERAL
GENERAL PURPOSE
LAKE ELSINORE UNIF IMP NO 96-1
LAKE ELSINORE UNIFIED
METRO WATER WEST 1302999
MT SAN JACINTO JUNIOR COLLEGE
N.W. MOSQUITO & VECTOR CONT DIST
RANCHO LAGUNA RDV 1
RIV CO REG PARK & OPEN SPACE
RIV. CO. OFFICE OF EDUCATION
WESTERN MUNICIPAL WATER

Tuesday, March 8, 2016

Search Again

Property Information Center

Property Information for the 2014-2015 tax year as of January 1, 2014

Property Information

Parcel Number:	378030009-2
Property Address:	
Legal Description:	Lot 5 MB 008/377 MAP SUBS IN ELSINORE
Property Type:	N/A
Assessment Description:	N/A
Year Built	0000
Square Feet:	N/A
Bedroom:	N/A
Bath:	N/A
Pool:	N
Lot Size:	0.08 Acres

Sales Information

Last Recorded Document:	09/2006
Recording Number:	0669997

Assessed Value Information

Land	27,864
Full Value	27,864
Total Net	27,864

Assessment Information

Assessment Number:	378030009-2
Tax Rate Area:	005-018
Taxability Code:	0-00
Base Year:	2007

Parcel Map

View Parcel Map

Related Property Information

City Sphere:	LAKE ELSINORE
Supervisorial District:	KEVIN JEFFRIES
Landuse Designation:	CITY
Agriculture Preserve:	NOT IN AN AGRICULTURE PRESERVE
School District:	LAKE ELSINORE UNIFIED
Water District:	WMWD
Fema Flood Plan:	FLOOD ZONE X

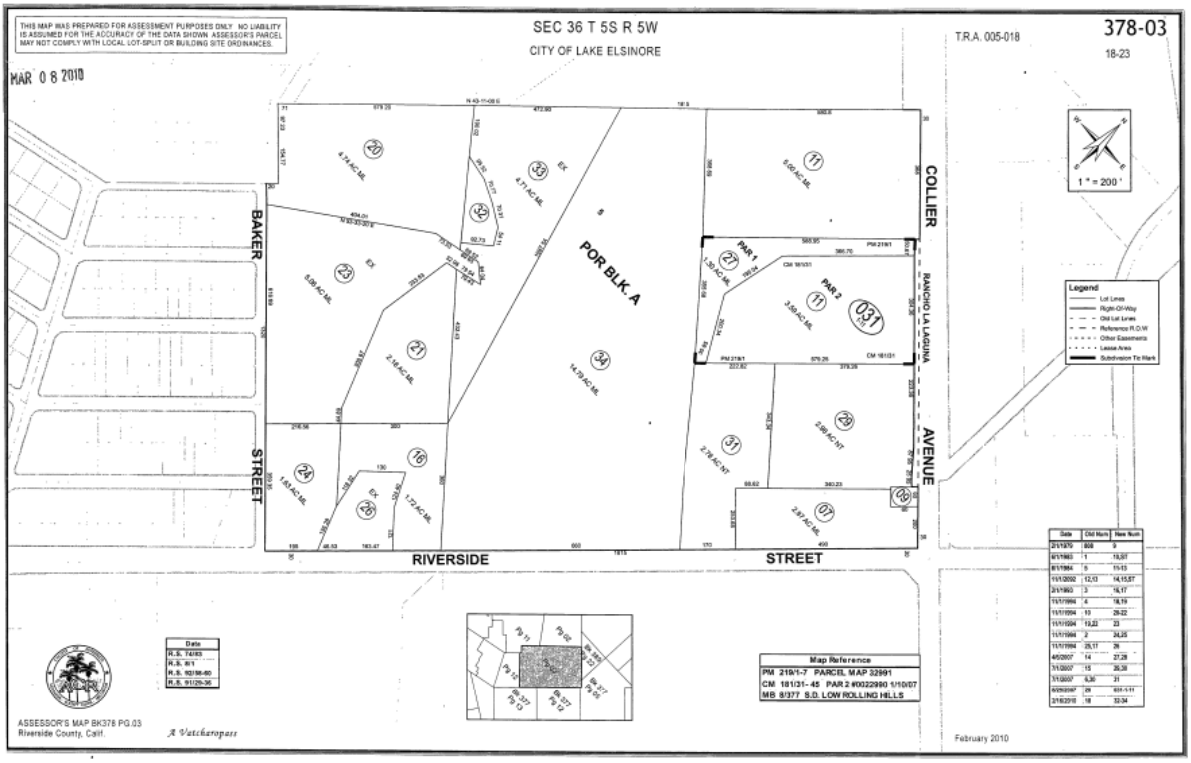
Tax Assessment District

CITY OF LAKE ELSINORE ANX
COUNTY FREE LIBRARY
COUNTY STRUCTURE FIRE PROTECTION
CSA 152
ELS MURRIETA ANZA RESOURCE CONS
ELSINORE AREA ELEM SCHOOL FUND
ELSINORE VAL MUN WTR IMP DIST 1
ELSINORE VALLEY CEMETERY
ELSINORE VALLEY MUNICIPAL WATER
FLOOD CONTROL ADMINISTRATION
FLOOD CONTROL ZONE 3
GENERAL
GENERAL PURPOSE
LAKE ELSINORE UNIF IMP NO 96-1
LAKE ELSINORE UNIFIED
METRO WATER WEST 1302999
MT SAN JACINTO JUNIOR COLLEGE
N.W. MOSQUITO & VECTOR CONT DIST
RANCHO LAGUNA RDV 1
RIV CO REG PARK & OPEN SPACE
RIV. CO. OFFICE OF EDUCATION
WESTERN MUNICIPAL WATER

Parcel Number: 378030007-0
Map Book: 378
Page/Block: 030
Parcel: 7
Check Digit: 0

HOW TO READ THE ASSESSOR'S MAP PAGE

The numerical parcel number on a map page consists of three main segments. The first three digits is the map book number. The second set of three numbers is the page/block number, and the third segment identifies the parcel number.



2.87 AC

GeoRox Engineering
Geotechnical and Environmental Consultanting

User Questionnaire And/Or Prospective Landowner

Description of Site

Legal Site Address: 29301 RIVERSIDE DRIVE, LAKE ELSINORE, CA 92530

Assessor Parcel Number(s): 378-030-007

Current Owner(s): DSGS INC

Phone No.: 562-927-7420

Current Occupant(s): NONE

Phone No.: ~~———~~

Questionnaire:

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
1a. Is the property used for an industrial use?	Yes (No) Unk	Yes No Unk	
1b. Is any adjoining property used for an industrial use?	(Yes) No Unk	Yes No Unk	OFFICE and WAREHOUSING
2a. Did you observe evidence or do you have any prior knowledge that the propertyhas been used for an industrial use in the past?	Yes (No) Unk	Yes No Unk	
2b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used for industrial use in the past?	(Yes) No Unk	Yes No Unk	OFF. & WAREHOUSE

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
3a. Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
3b. Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4a. Did you observe evidence or do you have any prior knowledge that the property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
5a. Are there currently any damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant	Explain in detail any "Yes" answers.

		(if applicable)	(use extra sheet if necessary)
5b. Did you observe evidence or do you have any prior knowledge that there have been previously any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	
6a. Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
6b. Did you observe evidence or do you have any prior knowledge that there have been previously any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
7a. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that originated from a contaminated site?	Yes (No) Unk	Yes No Unk	
7b. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that is of an unknown origin?	Yes (No) Unk	Yes No Unk	
8a. Are there currently any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
8b. Did you observe evidence or do you have any prior knowledge that there have been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
9a. Is there currently any stained soil on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

9b. Did you observe evidence or do you have any prior knowledge that there has been previously, any stained soil on the property?	Yes (No) Unk	Yes No Unk	
10a. Are there currently any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
10b. Did you observe evidence or do you have any prior knowledge that there have been previously, any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
11a. Are there currently any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
11b. Did you observe evidence or do you have any prior knowledge that there have been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
12a. Is there currently evidence of leaks, spills or staining by substances other than water, or foul odors, associated with any flooring, drains, walls, ceilings, or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	
12b. Did you observe evidence or do you have any prior knowledge that there have been previously any leaks, spills, or staining by substances other than water, or foul odors, associated with any flooring drains, walls, ceilings or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

13a. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that contaminants have been identified in the well or system that exceed guidelines applicable to the water system?	Yes No Unk N/A	Yes No Unk	
13b. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that the well has been designated as contaminated by any government environment health agency?	Yes No Unk N/A	Yes No Unk	
14. Does the owner or occupant of the property have any knowledge of environmental liens or govern-mental notification relating to past or recurrent violations of environ-mental laws with respect to the property or any facility located on the property?	Yes (No) Unk To the best of their knowledge *	Yes No Unk	
15a. Has the owner or occupant of the property been informed of the past existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk * To the best of their knowledge	Yes No Unk	
15b. Has the owner or occupant of the property been informed of the current existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	
15c. Has the owner or occupant of the property been informed of the past existence of environmental violations with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

16. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	Yes (No) Unk	Yes No Unk	
17. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concern-ing a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	Yes (No) Unk	Yes No Unk	
18a. Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a storm water system?	Yes (No) Unk *	Yes No Unk	
18b. Does the property discharge waste water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a sanitary sewer system?	Yes (No) Unk *	Yes No Unk	
19. Did you observe evidence or do you have any prior knowledge that any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	Yes (No) Unk *	Yes No Unk	
20. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	Yes (No) Unk	Yes No Unk	

* Not to the best of their knowledge.

This questionnaire was completed by:

Name RON GRAVES

Title Broker

Firm Coldwell Banker Commercial

Address 4660 La Jolla Village Dr.
Suite 1070, San Diego, CA 92121

Phone Number 858 822-9215

Date 3/4/16

BY SMALL

GeoRox Engineering
Geotechnical and Environmental Consultanting

User Questionnaire And/Or Prospective Landowner

Description of Site

Legal Site Address: VACANT LAND

Assessor Parcel Number(s): 378-030-009

Current Owner(s): Christos J & MARY J SMYRNIOTIS

Phone No.:

Current Occupant(s): VACANT

Phone No.: N/A

Questionnaire:

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
1a. Is the property used for an industrial use?	Yes (No) Unk	Yes No Unk	
1b. Is any adjoining property used for an industrial use?	(Yes) No Unk	Yes No Unk	OFFICE and WAREHOUSING
2a. Did you observe evidence or do you have any prior knowledge that the propertyhas been used for an industrial use in the past?	Yes (No) Unk	Yes No Unk	
2b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used for industrial use in the past?	(Yes) No Unk	Yes No Unk	SAME as above

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
3a. Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
3b. Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4a. Did you observe evidence or do you have any prior knowledge that the property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
5a. Are there currently any damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant	Explain in detail any "Yes" answers.

		(if applicable)	(use extra sheet if necessary)
5b. Did you observe evidence or do you have any prior knowledge that there have been previously any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	
6a. Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
6b. Did you observe evidence or do you have any prior knowledge that there have been previously any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
7a. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that originated from a contaminated site?	Yes (No) Unk	Yes No Unk	
7b. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that is of an unknown origin?	Yes (No) Unk	Yes No Unk	
8a. Are there currently any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
8b. Did you observe evidence or do you have any prior knowledge that there have been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
9a. Is there currently any stained soil on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

9b. Did you observe evidence or do you have any prior knowledge that there has been previously, any stained soil on the property?	Yes (No) Unk	Yes No Unk	
10a. Are there currently any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
10b. Did you observe evidence or do you have any prior knowledge that there have been previously, any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
11a. Are there currently any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
11b. Did you observe evidence or do you have any prior knowledge that there have been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
12a. Is there currently evidence of leaks, spills or staining by substances other than water, or foul odors, associated with any flooring, drains, walls, ceilings, or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	
12b. Did you observe evidence or do you have any prior knowledge that there have been previously any leaks, spills, or staining by substances other than water, or foul odors, associated with any flooring drains, walls, ceilings or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

13a. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that contaminants have been identified in the well or system that exceed guidelines applicable to the water system?	Yes No Unk N/A	Yes No Unk	
13b. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that the well has been designated as contaminated by any government environment health agency?	Yes No Unk N/A	Yes No Unk	
14. Does the owner or occupant of the property have any knowledge of environmental liens or govern-mental notification relating to past or recurrent violations of environ-mental laws with respect to the property or any facility located on the property?	Yes (No) Unk To the best of their Knowledge *	Yes No Unk	
15a. Has the owner or occupant of the property been informed of the past existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk * To the best of their Knowledge	Yes No Unk	
15b. Has the owner or occupant of the property been informed of the current existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	
15c. Has the owner or occupant of the property been informed of the past existence of environmental violations with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

16. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	Yes (No) Unk	Yes No Unk	
17. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concern-ing a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	Yes (No) Unk	Yes No Unk	
18a. Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a storm water system?	Yes (No) Unk *	Yes No Unk	
18b. Does the property discharge waste water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a sanitary sewer system?	Yes (No) Unk *	Yes No Unk	
19. Did you observe evidence or do you have any prior knowledge that any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	Yes (No) Unk *	Yes No Unk	
20. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	Yes (No) Unk	Yes No Unk	

* Not to the best of their knowledge.

This questionnaire was completed by:

Name RON GRAVES

Title Broker

Firm Coldwell Banker Commercial

Address 4660 La Jolla Village Dr.
Suite 1070, San Diego, CA 92121

Phone Number 858 822-9215

Date 3/4/16

Elsinore Groundwater Basin

- Groundwater Basin Number: 8-4
- County: Riverside
- Surface Area: 25,700 acres (40.2 square miles)

Basin Boundaries and Hydrology

The Elsinore Groundwater Basin underlies the Elsinore Valley in western Riverside County. The basin is bounded on the southwest by the Santa Ana and Elsinore Mountains along the Willard fault, a splay of the active Elsinore fault zone. The basin adjoins the Temecula Valley Groundwater Basin on the southeast at a low surface drainage divide. The basin is bounded on the northwest by the Temescal Subbasin of the Upper Santa Ana River Valley Groundwater Basin at a constriction in Temescal Wash. The basin is bounded on the northeast by nonwater-bearing rocks of the Peninsular Ranges along the Glen Ivy fault. Average annual precipitation ranges from 12 to 14 inches. Lake Elsinore lies in a closed basin formed between strands of the active Elsinore fault zone.

Hydrogeologic Information

Water Bearing Formations

The Elsinore Groundwater Basin contains alluvial fan, floodplain, and lucustrine deposits, which are underlain by alluvium of the Pauba Formation (DWR 1981). The maximum thickness of sedimentary deposits reaches 2,300 feet beneath Lake Elsinore (DWR 1981). Specific yield for the basin ranges from about 6 to 16 percent and averages about 7.6 percent (SWRB 1956).

Alluvial Fan, Floodplain, and Lacustrine Deposits. These deposits are Late Pleistocene to Holocene in age and form the surficial materials of the basin. Alluvial fan deposits of gravel, sand, silt, and clay are found near the western and northeastern edges of the basin emanating from the adjacent crystalline mountains. The interior of the valley contains floodplain deposits that reach a thickness of about 200 feet and contain stringers of sand and gravel in finer silt and clay. In the zone of inundation of Lake Elsinore, fine-grained lacustrine deposits of sand, silt, and clay reach 800 feet in thickness (DWR 1981). The lake deposits have a specific yield of about 6 percent, whereas the floodplain deposits range from 9 to 12 percent (DWR 1981).

Pauba Formation. The Pleistocene age Pauba Formation is a composed of alluvial sandstone and fanglomerate members (Morton and others 1999) that reach a maximum thickness of about 2,200 feet beneath lake Elsinore (DWR 1981). This is the principal water-bearing unit of the basin, with the most productive wells extracting from alluvial sand and gravel bodies that occur as stringers within less pervious silt- and clay–rich deposits. In general, sediments are coarser near the margins of the basin and become finer toward Lake Elsinore. Specific yield for the Pauba Formation averages about 9 percent (DWR 1981).

Restrictive Structures

Groundwater movement in the basin is strongly influenced by faults cutting the alluvial and lacustrine sediments in Elsinore Groundwater Basin. Differences in groundwater elevation are found across the Wildomar, Willard, and Glen Ivy faults, indicating that they are barriers to groundwater flow (DWR 1953, SWRB 1956; DWR 1981). As many as 8 separate fault bounded blocks are interpreted in the basin and there appears to be little groundwater movement across these bounding faults (DWR 1981).

Recharge Areas

The principal recharge of the basin is from infiltration of stream flow through alluvial fan deposits near the edges of the basin and through gravel deposits along the course of the San Jacinto River. Other contributing sources include infiltration from unlined channels overlying the basin, underflow from saturated alluvium and fractures within the surrounding bedrock mountains and hills, and spreading of water in recharge basins (WE 2000).

Groundwater Level Trends

Groundwater levels within Elsinore Groundwater Basin declined more than 100 feet between 1927 and 1950 (DWR 1953). A hydrograph from one well shows that water level declined about 110 feet in the southern part of the basin from 1967 through 1985. However, a hydrograph from a well in the northern part of the basin shows a rise in water level of about 65 feet from 1963 through 1980. Under natural conditions, groundwater should flow generally toward Lake Elsinore; however, because faults cutting the sediments impede groundwater movement, groundwater flow is dominantly contained within fault blocks in the basin.

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity is estimated to be about 27,000 af (SWRB 1956, DWR 1975), 1,840,000 af (DWR 1981), and 1,400,000 af (EVMWD 2001).

Groundwater in Storage. Groundwater in storage in 1964 and 1975 was estimated to be about 1,000,000 af (DWR 1981). About 245,000 af of available dry storage in 1999 (EVMWD 2001) suggests that about 1,155,000 af of groundwater in storage was available.

Groundwater Budget (Type C)

Mean subsurface inflow is estimated to be about 800 af/yr (SWRB 1956). Total extraction for 1978 is estimated to have been 8,081 af (DWR 1981).

Groundwater Quality

Characterization. Groundwater northeast of Lake Elsinore is calcium sulfate character, whereas groundwater southeast of the lake is calcium bicarbonate (SWRB 1956). Groundwater in the central part of the basin has sodium sulfate-bicarbonate character (DWR 1981). Springs and wells near the town of Elsinore yield water of sodium sulfate character (DWR 1981). The range of TDS content for 17 public wells is 290 to 680 mg/L and the average TDS content is 460 mg/L.

Impairments. Fluoride content exceeding recommended levels has been found in groundwater near the town of Elsinore (DWR 1953; SWRB 1967).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	18	1
Radiological	20	0
Nitrates	18	0
Pesticides	20	0
VOCs and SVOCs	20	1
Inorganics – Secondary	18	4

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 5,400 gal/min (DWR 1978)	Average:
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range: to 2,306 ft (DWR 1978)	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
US Geological Survey	Groundwater levels	1
US Geological Survey	Miscellaneous water quality	1
Department of Health Services and cooperators	Title 22 water quality	18

Basin Management

Groundwater management:	Elsinore Valley Municipal Water District has proposed a groundwater management plan.
Water agencies	
Public	Elsinore Valley Municipal Water District
Private	

References Cited

California Department of Water Resources (DWR). 1953. *Elsinore Basin Investigation.* Bulletin No. 9.

_____, Southern District. 1978. A Preliminary Evaluation of *Ground Water Conditions in the Vicinity of Lake Elsinore. Southern* District Technical Information Record 1080-A-1 34 p.

_____, Southern District. 1981. *Investigatin of Ground Water Supply for Stabilization of Level of Lake Elsinore, Riverside County.* District Report to Department of Parks and Recreation under Interagency agreement 162083. 45 p.

California State Water Resources Board (SWRB). 1956. *Santa Ana River Investigation:* State Water Resources Board Bulletin No. 15. 207 p. [nb: later published in 1959 as DWR Bulletin No. 15).

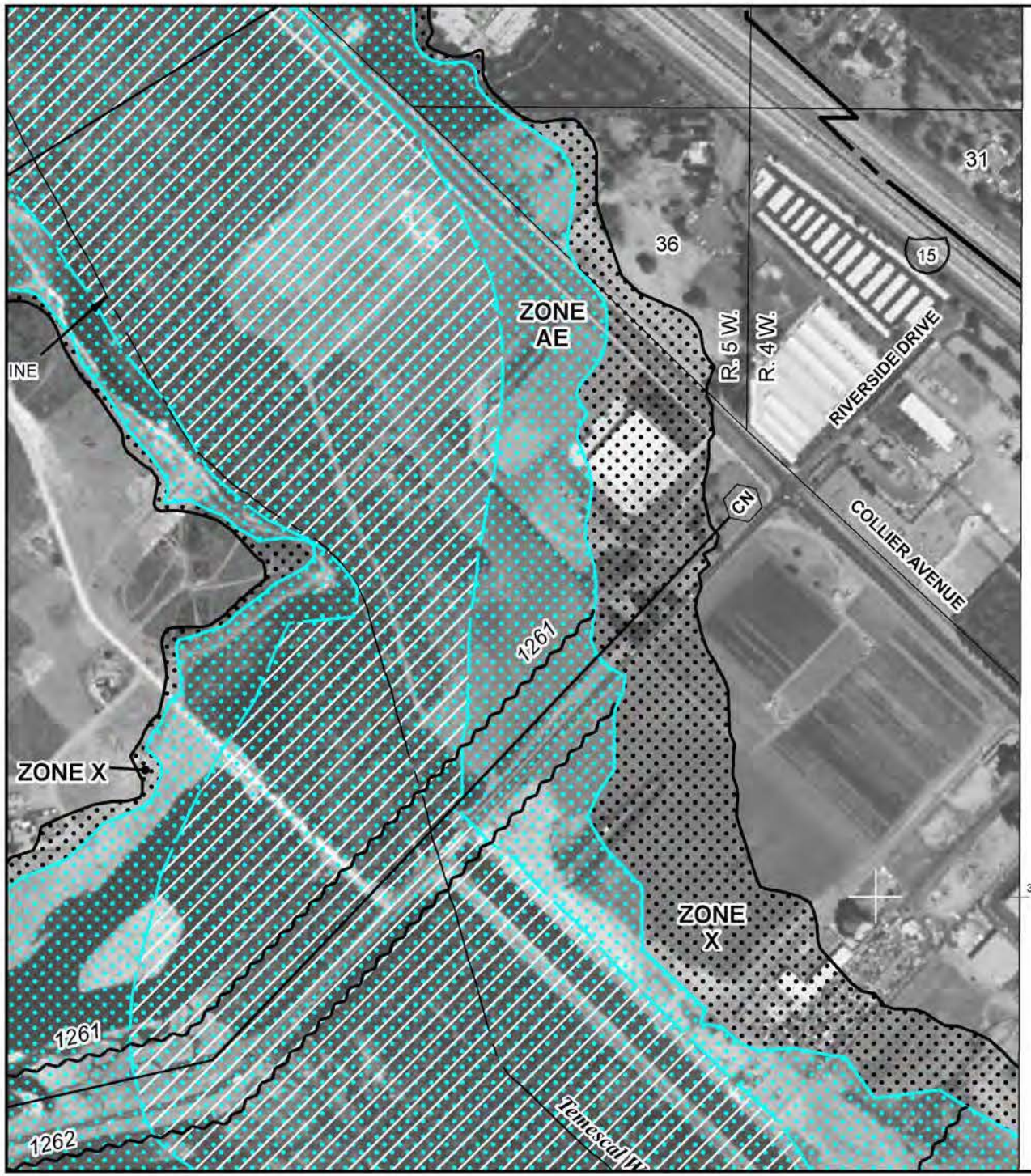
Eastern Valley Municipal Water District (EVMWD). 2001. Elsinore Valley Pilot Recharge Demonstration Project Grant Application.

Morton, D.M., Hauser, R.M., and Ruppert, K.R. 1999. *Preliminary digital geologic map of the Santa Ana 30'x60' quadrangle, southern California, version 1.0.* U.S. Geological Survey Open-File Report 99-172 15p., scale 1:100,000, 2 sheets.

Wildermuth Environmental (WE). 2000. *TIN/TDS Study Phase 2A.*

Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2028G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 2028 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAKE ELSINORE, CITY OF	060636	2028	G
RIVERSIDE COUNTY	060245	2028	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C2028G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

RCRA Waste Code By Year Matrix Report

ID Number: CAD981615784

Entity Type: GENERATOR

Weight (in Tons)

Ship Years

RCRA Code	Description	1993	1994	1998	1999	2000	2001
	Blank/Unknown	**5.0062**	**0.6000**			**0.7506**	**0.4500**
D006	Cadmium			**0.3276**			
D039	Tetrachloroethylene				**1.4826**	**0.3402**	**2.1252**
NONE	Blank/Unknown						
Grand Total		**5.0062**	**0.6000**	**0.3276**	**1.4826**	**1.0908**	**2.5752**

2002	2003	2004	2006	2007	2008	2009	2013
0.3402	**0.5075**	**0.3000**	**2.0000**	**0.7500**	**0.9760**	**1.0000**	**1.0500**
		0.6500					
0.3402	**0.5075**	**0.9500**	**2.0000**	**0.7500**	**0.9760**	**1.0000**	**1.0500**

2015
0.1500
0.1500

The URL you requested has changed. You have been redirected to the new URL. Please update your bookmarks.

ECHO Enforcement and Compliance History Online

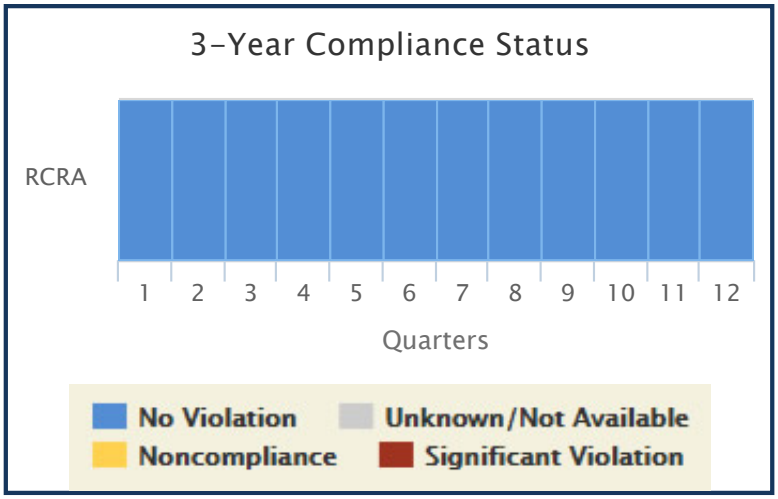
Detailed Facility Report

Facility Summary

E Z PRODUCTS

17999 COLLIER AVE, LAKE ELSINORE, CA 92530

FRS (Facility Registry Service) ID: 110002725141
EPA Region: 09
Latitude: 33.69529
Longitude: -117.34766
Locational Data Source: FRS
Industry: No description found
Indian Country: N



Enforcement and Compliance Summary

Statute	Insp (5 Years)	Date of Last Inspection	Current Compliance Status	Qtrs in NC (Non-Compliance) (of 12)	Qtrs in Significant Violation	Informal Enforcement Actions (5 years)	Formal Enforcement Actions (5 years)	Penalties from Formal Enforcement Actions (5 years)	EPA Cases (5 years)	Penalties from EPA Cases (5 years)
RCRA	--	--	**No Violation**	0	0	--	--	--	--	--

Regulatory Information

Clean Air Act (CAA): No Information
Clean Water Act (CWA): No Information
Resource Conservation and Recovery Act (RCRA): Active (H) SQG (CAD981615784)
Safe Drinking Water Act (SDWA): No Information

Other Regulatory Reports

Air Emissions Inventory (EIS): No Information
Greenhouse Gas Emissions (eGGRT): No Information
Toxic Releases (TRI): No Information

Facility/System Characteristics

Facility/System Characteristics

System	Statute	Identifier	Universe	Status	Areas	Permit Expiration Date	Indian Country	Latitude	Longitude
FRS		110002725141					N	33.69529	-117.34766
RCR	RCRA	CAD981615784	SQG	Active (H)			N	33.695181	-117.34679

Facility Address

System	Statute	Identifier	Facility Name	Facility Address
FRS		110002725141	E Z PRODUCTS	17999 COLLIER AVE, LAKE ELSINORE, CA 92530
RCR	RCRA	CAD981615784	E Z PRODUCTS	17999 COLLIER AVE, LAKE ELSINORE, CA 92530

Facility SIC (Standard Industrial Classification) Codes

System	Identifier	SIC Code	SIC Desc
No data records returned			

Facility NAICS (North American Industry Classification System) Codes

System	Identifier	NAICS Code	NAICS Description
No data records returned			

Facility Tribe Information

Tribal Name	EPA Tribal ID	Distance to Tribe (miles)
Pechanga Reservation	100000198	21.35
Soboba Reservation	100000283	24.79

Enforcement and Compliance

Compliance Monitoring History (5 years)

Statute	Source ID	System	Inspection Type	Lead Agency	Date	Finding
No data records returned						

Entries in italics are not considered inspections in official counts.

Compliance Summary Data

Statute	Source ID	Current SNC (Significant Non-compliance)/HPV (High Priority Violation)	Description	Current As Of	Qtrs in NC (Non-Compliance) (of 12)
RCRA	CAD981615784	No		03/05/2016	0

Three Year Compliance Status by Quarter

Statute	Program/Pollutant/Violation Type	QTR 1	QTR 2	QTR 3	QTR 4	QTR 5	QTR 6	QTR 7	QTR 8	QTR 9	QTR 10	QTR 11	QTR 12
RCRA (Source ID: CAD981615784)		04/01-06/30 2013	07/01-09/30 2013	10/01-12/31 2013	01/01-03/31 2014	04/01-06/30 2014	07/01-09/30 2014	10/01-12/31 2014	01/01-03/31 2015	04/01-06/30 2015	07/01-09/30 2015	10/01-12/31 2015	01/01-03/31 2016
RCRA	Facility-Level Status												

Informal Enforcement Actions (5 Years)

Statute	Source ID	Type of Action	Lead Agency	Date
No data records returned				

Formal Enforcement Actions (5 Years)

Statute	Source ID	Type of Action	Lead Agency	Date	Penalty	Penalty Description
No data records returned						

ICIS (Integrated Compliance Information System) Case History (5 years)

Primary Law/Section	Case No.	Case Type	Lead Agency	Case Name	Issued/Filed Date	Settlement Date	Federal Penalty	State/Local Penalty	SEP (Supplemental Environmental Project) Cost	Comp Action Cost
No data records returned										

Environmental Conditions

Water Quality

Permit ID	Combined Sewer System?	Number of CSO (Combined Sewer Overflow) Outfalls	Watershed (HUC (Hydrologic Unit Code) 8)	Watershed Name (HUC (Hydrologic Unit Code) 8)	Watershed (HUC (Hydrologic Unit Code) 12)	Watershed Name (HUC (Hydrologic Unit Code) 12)	Receiving Waters	Impaired Waters	Impaired Class	Causes of Impairment(s) by Group(s)	Watershed with ESA (Endangered Species Act)-listed Aquatic Species?
No data records returned											

Waterbody Designated Uses

Reach Code	Waterbody Name	Exceptional Use	Recreational Use	Aquatic Life Use	Shellfish Use	Beach Closure Within Last Year	Beach Closure Within Last Two Years
No data records returned							

Air Quality

Non-Attainment Area?	Pollutant(s)
Yes	Ozone
No	Lead
Yes	Particulate Matter

Pollutants

Toxics Release Inventory History of Reported Chemicals Released in Pounds per Year at Site

TRI Facility ID	Year	Total Air Emissions	Surface Water Discharges	Off-Site Transfers to POTWs (Publicly Owned Treatment Works)	Underground Injections	Releases to Land	Total On-site Releases	Total Off-site Releases
No data records returned								

Toxics Release Inventory Total Releases and Transfers in Pounds by Chemical and Year

Chemical Name
No data records returned

Demographic Profile

Demographic Profile of Surrounding Area (3 Miles)

This section provides demographic information regarding the community surrounding the facility. ECHO compliance data alone are not sufficient to determine whether violations at a particular facility had negative impacts on public health or the environment. Statistics are based upon the 2010 US Census and American Community Survey data, and are accurate to the extent that the facility latitude and longitude listed below are correct. The latitude and longitude are obtained from the EPA Locational Reference Table (LRT) when available.

Radius of Area:	3	Land Area:	87%	Households in Area:	10,570
Center latitude:	33.69529	Water Area:	13%	Housing Units in Area:	11,668
Center Longitude:	-117.34766	Population Density:	1,540/sq.mi.	Households on Public Assistance:	352
Total Persons:	37,363	Percent Minority:	65%	Persons Below Poverty Level:	13,362

Race Breakdown	Persons (%)	Age Breakdown	Persons (%)
White:	21,958 (58.77%)	Child 5 years and younger:	3,336 (8.93%)
African-American:	1,672 (4.48%)	Minors 17 years and younger:	11,924 (31.91%)
Hispanic-Origin:	20,028 (53.6%)	Adults 18 years and older:	25,439 (68.09%)
Asian/Pacific Islander:	1,623 (4.34%)	Seniors 65 years and older:	2,310 (6.18%)
American Indian:	397 (1.06%)		
Other/Multiracial:	11,714 (31.35%)		

Education Level (Persons 25 & older)	Persons (%)	Income Breakdown	Households (%)
Less than 9th Grade:	2,038 (10.14%)	Less than $15,000:	1,128 (10.74%)
9th through 12th Grade:	2,795 (13.91%)	$15,000 - $25,000:	964 (9.18%)
High School Diploma:	6,384 (31.76%)	$25,000 - $50,000:	2,439 (23.23%)
Some College/2-yr:	6,071 (30.21%)	$50,000 - $75,000:	2,419 (23.04%)
B.S./B.A. or More:	2,811 (13.99%)	Greater than $75,000:	3,549 (33.8%)

Appendix H

Hydrology Study

Hydrology Study

for

29301 RIVERSIDE DRIVE
LAKE ELSINORE, CA 92530

JUNE 01, 2018

Prepared by:

Rahman Engineering Services, Inc.

5671 Schaefer Ave., Unit # F
Chino, CA 91710

(213) 400-8078

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Appendix A: Soil Type and Runoff Index Numbers .....
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Project Description:

The site comprises of 2 assessor's parcel (lots - APN 378-030-007 AND APN 378-030-009). Currently, the site is vacant, undeveloped land with shrubs, grass and weeds grown throughout the site. The site is located on the west side of the intersection of Riverside Drive and Collier Avenue in the City of Lake Elsinore. The site is approximately 2.40 acres (104,045 sf) with moderate terrain that predominantly slopes from the east to the west; with approximately 8 feet of topographic relief across the site. Drainage flow at the site is dominated by sheet flowing across the property towards the west. Figure 1 shows the site and surrounding features.

The project proposes to develop commercial buildings with associated paved driveway, parking, walkway and landscape throughout. The proposed development consists of two single-story commercial buildings (one restaurant and one food mart with gasoline dispensing island) with total impervious coverage of 91,422 sf.

Purpose and objective:

The purpose and objective of this hydrology study are as follows:

1) to determine the design peak 10-year & 100-year frequency storm runoff for the project site.
2) To establish the finished pad elevation of proposed buildings that will be at least one foot (1-ft) above the water surface elevation of the 100-yr storm event.
3) To determine the hydraulic capacities of proposed storm drainage systems including ribbon gutter and parkway culvert to convey onsite storm runoffs into WQMP BMPS and ultimately to the street gutter in case of heavy rain.

Existing Drainage Pattern:

The watershed for the site is comprised of a single subarea (Subarea C). Currently, the drainage runoff from the site is towards the natural topographic direction from east to the west.

Proposed Drainage Pattern:

The watershed for the site is divided into two subareas; namely Subarea A and Subarea B. Subarea B is the tributary area from the C-store (23,242 sft) and adjacent paved area discharged into the proposed Bioretention basin located north of the driveway from Collier Ave.; and Subarea A is the remainder portion that includes the dispenser area, restaurant and the associated paved parking and driveway areas (62,929 sft). Discharge from the Subarea A is into the proposed Bioretention basin, located west of the driveway from Riverside Drive.

Methodology:

The hydrology calculations performed utilized the Section D -Rational Method of the Riverside County Flood Control and Water Conversation District Hydrology Manual (RCHM), dated April 1978. The 10-Year and 100-Year storm return frequency rainfall was used for existing and developed conditions.

The watershed studied consists of proposed project site is situated within the Riverside County within the 2-year and 100-year l-hour isohyet of 0.57 and 1.45 inches respectively (see enclosed Hydrology Map in Figure 2 to 4). The isohyet for 10-yr 1-hour rainfall was then interpolated from Figure 4 as 0.92 inches. The slope for the rainfall intensity curve for the site area was found to be 0.45 (see Figure 5).

Flood Insurance Rate Maps (FIRM):

The site is located in Zone X of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), Riverside County, California and incorporated areas panel 2028 of 3805 with map number 06065C2028G dated August 28, 2008. A Zone X is designation as areas determined to be outside of the 0.2% annual chance floodplain or areas of 0.2% annual chance flood: areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by leeves from 1% annual chance flood. The majority of the site falls within the later definition of Zone X. The FIRM map for this project is located in Figure 6.

Watershed Precipitation Data:

Precipitation data from the Isohyetal maps of the RCHM was used in this report and is shown below.

Table 1 – Precipitation Data (Rational Method Calculations)

Storm Event	Precipitation (inches)	Ref. Figure/Appendix
10-Yr, 1-Hr	0.92	
25-Yr, 1-Hr	1.12	
100-Yr, 1-Hr	1.45	

Hydrology Calculations & Summary:

Time of Concentration (Tc)

2.55e time of concentration (Tc) was obtained by first defining the subareas and their respective length of flow, elevation difference, and type of development. This data was then plotted onto Figure D-3 (see Figure 7), Time of Concentration Nomograph, in order to obtain the time of concentration for each drainage subarea per RCHM. Subarea Initial Time of Concentrations (Tc) has been shown in Table 2 below:

Table 2 – Time of Concentration

Development Stage (Pre/Post)	Node @ High Elev. (ft)	Node @ Low elev (ft)	Node Elev. Diff. (ft)	Flow length, L (ft)	Tc (min)	Ref. Appendix
Post-dev	1267.10	1264.55	2.55	280	7.6	
Post-dev	1266.25	1265.14	1.11	320	9.5	
Pre-dev	1269.00	1261.00	8.00	510	15.0	

Rainfall Intensity, I (in/hr)

This site-specific precipitation values from Table 1 were plotted onto Plate D-4 (Figure 8) in order to find the rainfall intensities (I), based on the log-log slope of site location (= 0.45) per Figure 5.

Subarea Rainfall Intensity (I) has been shown in table 3 below.

Table 3 – Rainfall Intensity

Subarea	Tc (Min)		100 Yr Rainfall Intensity, I_{100} (in/hr)		25 Yr Rainfall Intensity, I_{25} (in/hr)		10 Yr Rainfall Intensity, I_{10} (in/hr)		Ref. Appendix
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
A(Apn: 378-030-007)		7.6	`	3.65		2.82		2.26	
B(Apn: 378-030-009)		9.5		3.3		2.55		2.06	
A+B	15		2.82		2.08		1.67		

Soil Types and Runoff Index Numbers

Soil types on and near the project site (for on-site tributary) and corresponding Runoff Index Numbers (AMC II) used in this report are shown in Appendix A.

For the entire project site, soil type "B" is shown per Figure 8. For the existing condition, barren soil is selected as the site is 100% undeveloped with single subarea. For the developed condition, the project is composed of pervious (landscape) and impervious (roof, driveway/walkway/retaining wall) areas and the site is divided into two Subareas. Mixed cover has been calculated based on proportioning area of Landscape and Impervious Area.

Table 4 – On-site Pre-developed Runoff Index Numbers

Soil Cover	Soil Type	Quality of Cover	Area (SF)			SCS Curve No. (AMC II)		SCS Curve No. (AMC III)
			Pervious	Imp.	Total			
Barren	B	-	104,045	0	104,045		**86**	**97**
Landscape	B	-	0	0	0		56	
Imp. Area		-	0	0	0		98	
Mixed Cover	B	-				86 (0)	0 (0)	0
						56 (0)		
						98 (0)		

Table 5 – On-site Post-developed Condition Runoff Index Numbers; Subarea A

Soil Cover	Soil Type	Quality of Cover	Area (SF)			SCS Curve No. (AMC II)		SCS Curve No. (AMC III)
			Pervious	Imp.	Total			
Landscape	B	Good		0			56	76
Imp. Area		-	0				98	100
Mixed Cover	B	-					**92**	**98**
			10,605	66,752	77,357	56 (10,605)		
						98 (66,752)		

Table 6 – On-site Post-developed Runoff Index Numbers: Subarea B

Soil Cover	Soil Type	Quality of Cover	Area (SF)			SCS Curve No. (AMC II)		SCS Curve No. (AMC III)
			Pervious	Imp.	Total			
Landscape	B	Good		0			56	76
Imp. Area		-	0				98	100
Mixed Cover	B	-	1,463	25,205	26,668	56 (1,463)	**96**	**99**
						98 (25,205)		

Calculation of Runoff Coefficient, C:

The Runoff Coefficient, C can be calculated based on the % impervious and the Runoff Index based on rainfall intensity (see Appendix B) for the pre- and post-developed conditions and are presented below.

Pre-developed condition (Subarea A+B):
C_{10} = 0.79+((0.81-0.79)/0.5)*.0.17) = 0.80
C_{25}= 0.79+((0.81-0.79)/0.5)*.0.17) = 0.81
C_{100} = 0.83+(0.84-0.83)/0.5)*0.32) = 0.84

Post-developed condition, Subarea A:
C_{10} = 0.89
C_{25} = 0.90
C_{100} = 0.90

Post-developed condition, Subarea B:
C_{10} = 0.90
C_{25} = 0.90
C_{100} = 0.90

Calculation of Flow, Q:

The pre and post-development flow computations were performed and are presented below.

Table 7 – Runoff Flow

Subarea	Develop-ment Stage (Pre/Post)	Area, A (Ac)	Design Storm Frequency		Rainfall Intensity, I (in/hr)	Runoff Coefficient, C	Flow, Q = CIA, (cfs)
			Yr	Hr			
A	Post	1.78	10	1	2.26	0.9	3.61
			100		3.65	0.90	5.83
B	Post	0.61	10	1	2.06	0.9	1.14
			100		3.3	0.90	1.82
A+B	Pre	2.39	10	1	1.67	0.80	3.19
			100		2.82	0.84	5.66

Summary:

For the entire project site, Subarea A+B:

Pre-developed Q_{100} = 5.66 cfs

Pre-developed Q_{25} = 4.02 cfs

Pre-developed Q_{10} = 3.19 cfs

For Subarea A:

Post-developed Q_{100} = 5.83 cfs

Post-developed Q_{25}= 4.51 cfs

Post-developed Q_{10} = 3.57 cfs

For Subarea B:

Post-developed Q_{100} = 1.82 cfs

Post-developed Q_{25}= 1.41 cfs

Post-developed Q_{10} = 1.14 cfs

For Subarea A+B:

Post-developed Q_{100} = 7.75 cfs

Post-developed Q_{25}= 5.92 cfs

Post-developed Q_{10} = 3.75 cfs

Delta Q_{100} = 7.75-5.66 = 2.09 cfs;

Delta Q_{25} = 5.92-4.02 = 1.9 cfs;

Delta Q_{10} = 3.61-3.19 = 0.42 cfs

Results:

This hydrology study indicates that the Q100-yr storm events will produce a runoff of 5.83 cfs for Subarea A and 1.82 cfs for Subarea B respectively and that of and 10-yr storm events will produce a runoff of 3.61 cfs for Subarea A and 1.14 cfs for Subarea B respectively in the post- development stage from the subject site.

The Q25-yr storm events will produce a runoff of 4.51 cfs for Subarea A and 1.41 cfs for Subarea B respectively in the post-development stage from the subject site. Total runoff for 100- yr/25-yr/10-yr storm would be 7.75 cfs/5.92cfs/3.75 cfs respectively.

The differences of flows in 100-yr storm event would be 2.09 cfs or (2.09/5.66*100 =) 37% increase and that of 25-yr would be 1.9 cfs or (1.9/4.02*100=) 47.3% increase and that of 10-yr would be 0.42 cfs or (0.42/3.19*100=) 13.1% increase. The difference in all cases of storm events between the pre-and post-developed conditions are still within the range of moderate increase. Furthermore, the flow pattern would be reversed as opposed to the pre-developed condition and the storm water will be captured in on-site in landscape area where bioretention basins are proposed. Only excess runoff would be allowed to overflow onto street gutters through via parkway culvert. Considering the flow of 25-yr rainfall events, corresponding design storm drain overflow channel of 3' widex 3" deep (metal) for Subarea A and 3-4" PVC (SDR 35) pipe for Subarea B (see Appendix C).

Further analysis was done (see Appendix C) to find out the required minimum pad elevation considering the highest Q at Node 2 which resulted in a channel depth of 0.0782 ft (1") over the entire parking area of Subarea A. Therefore, the proposed minimum pad elevation (1265.33') is okay.

Conclusions:

The increase in runoff cause by this development will be mitigated by containing the 100 year runoff within the street r/w. The on-site BMP and storage facilities are adequate to handle the increase runoff .

FIGURES

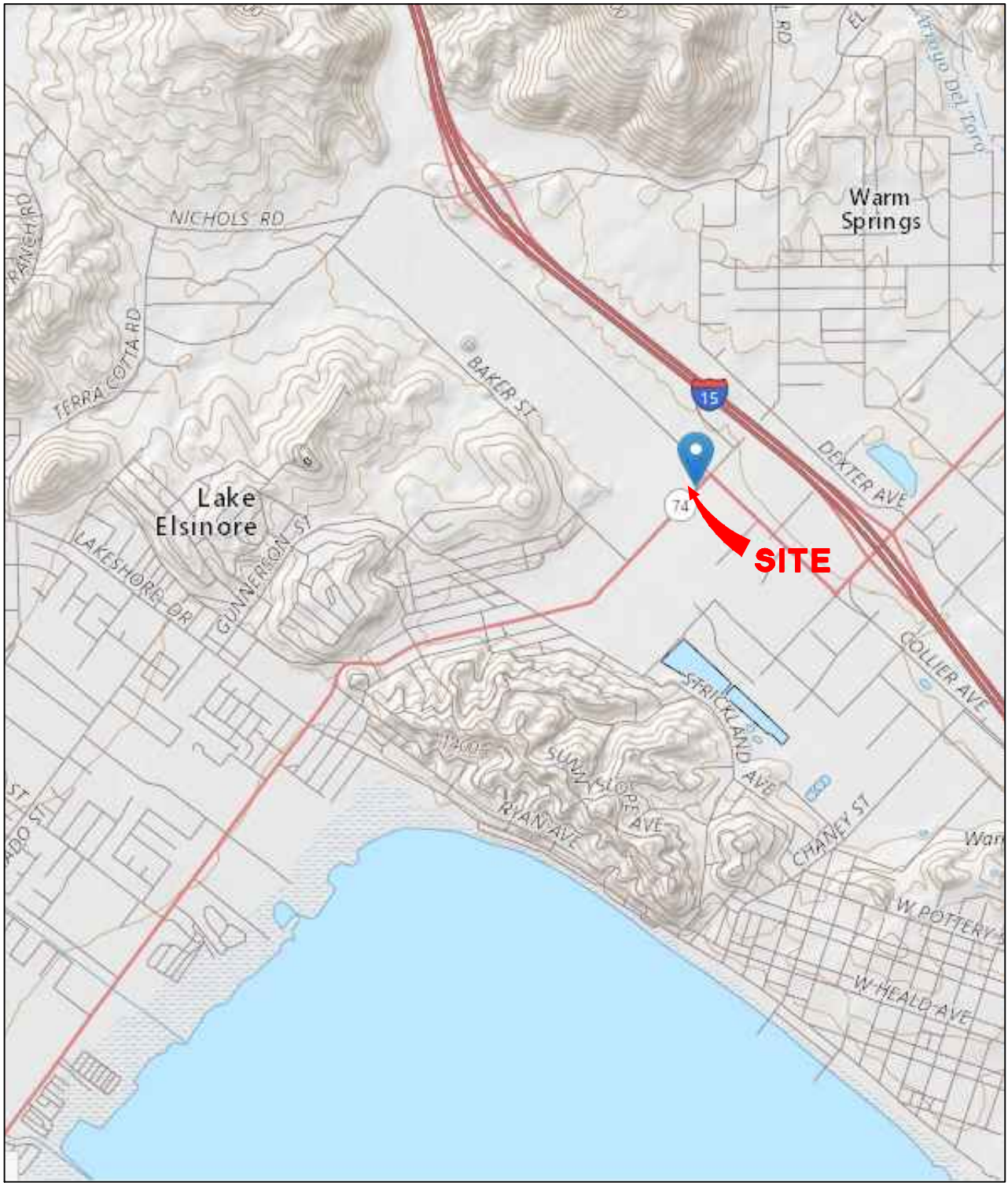


FIGURE 1
SITE VICINITY MAP
NOT TO SCALE

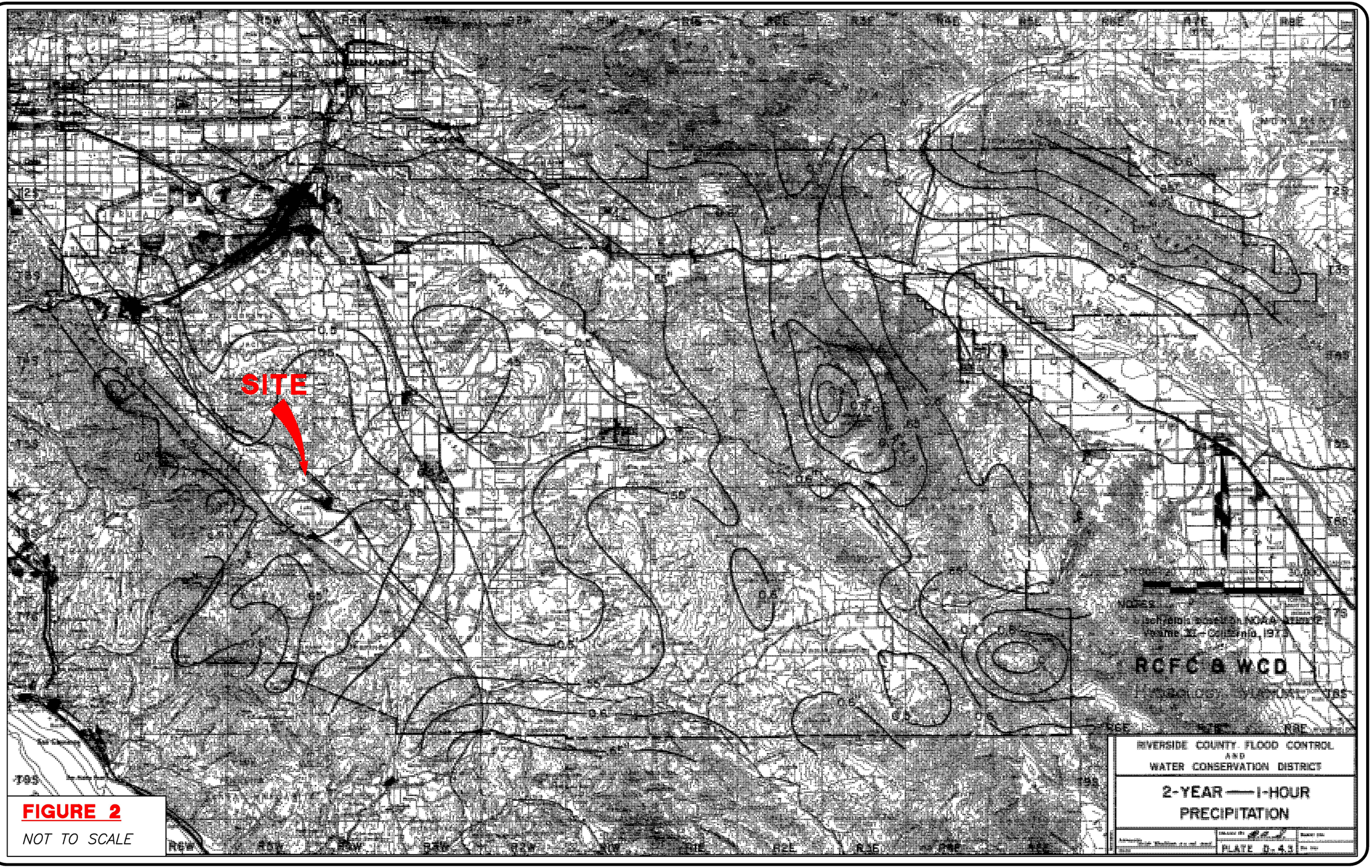


FIGURE 2

NOT TO SCALE

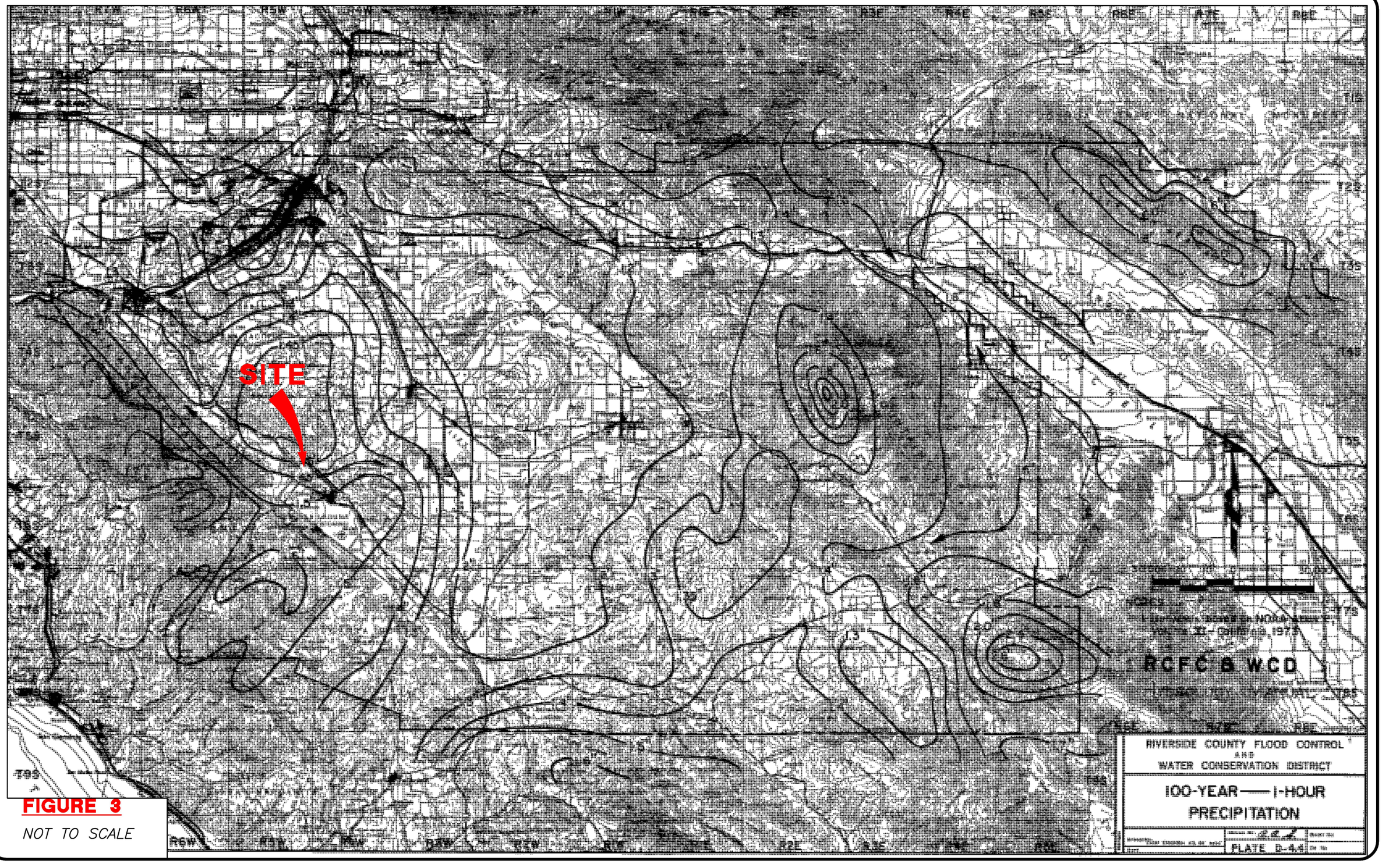
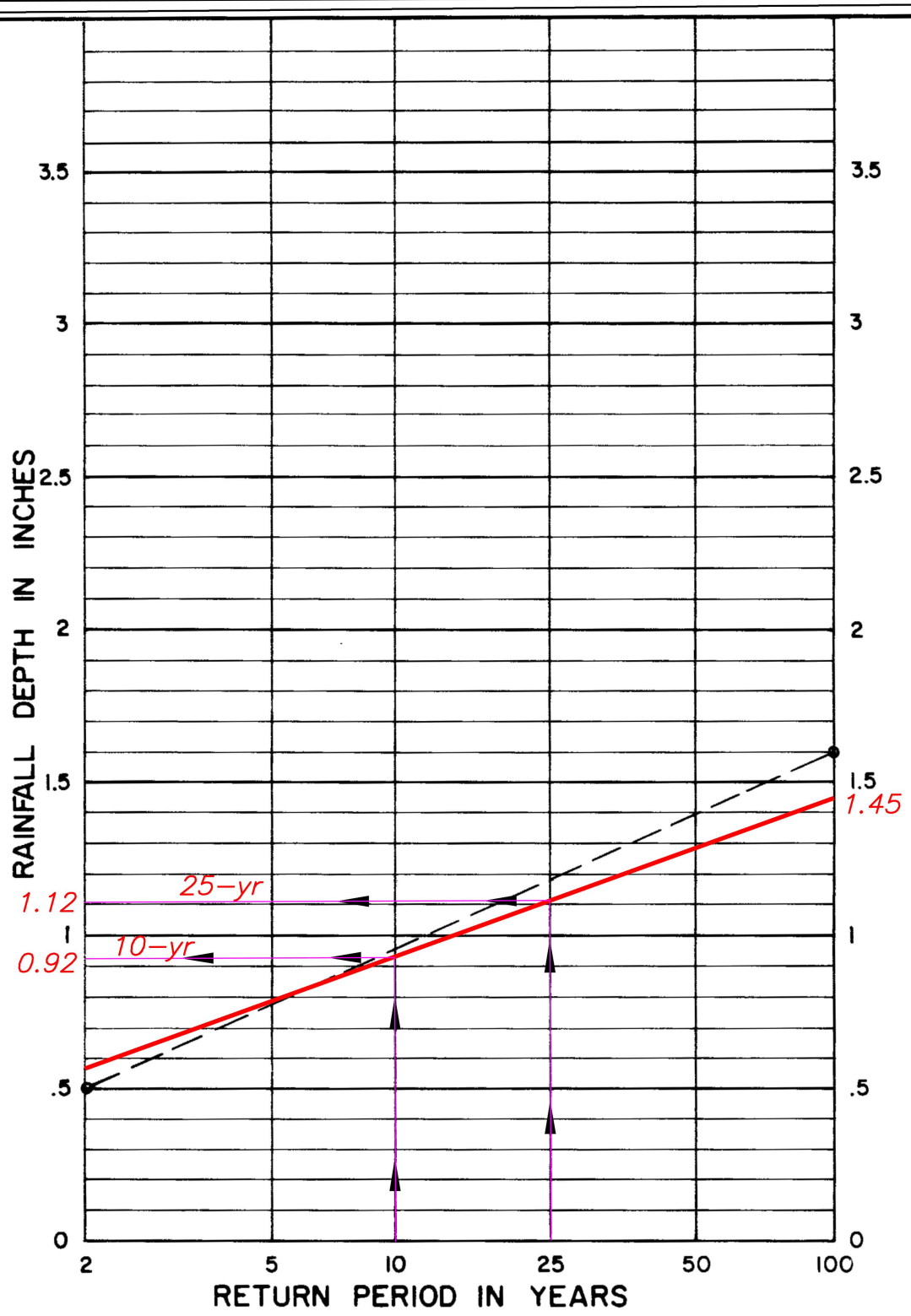


FIGURE 3

NOT TO SCALE



NOTE:

1. For intermediate return periods plot 2-year and 100-year one hour values from maps, then connect points and read value for desired return period. For example given 2-year one hour = .50" and 100-year one hour = 1.60", 25-year one hour = 1.18"

Reference: NOAA Atlas 2, Volume XI - California, 1973.

RCFC & WCD

HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

FIGURE 4

PLATE D-4.5

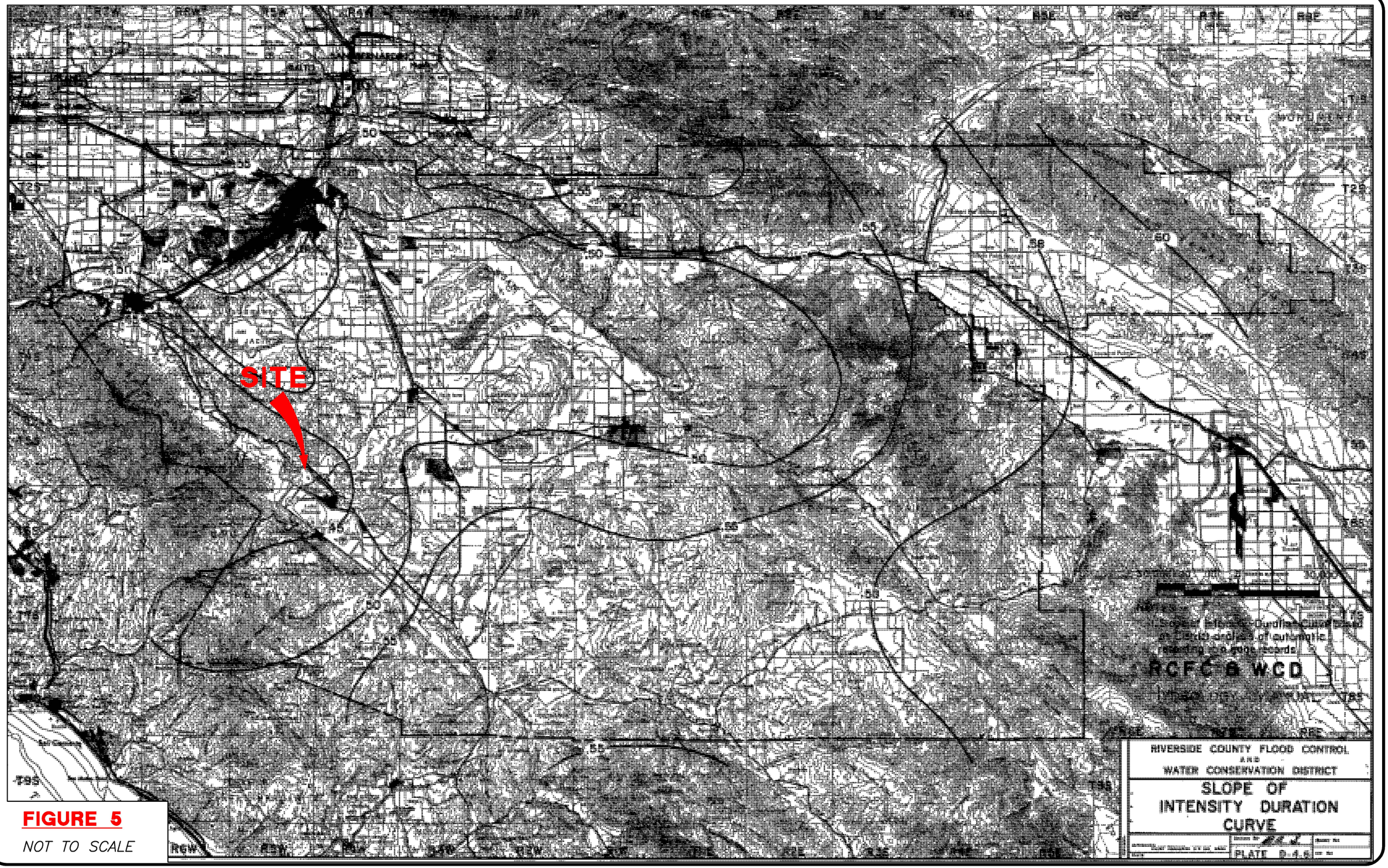
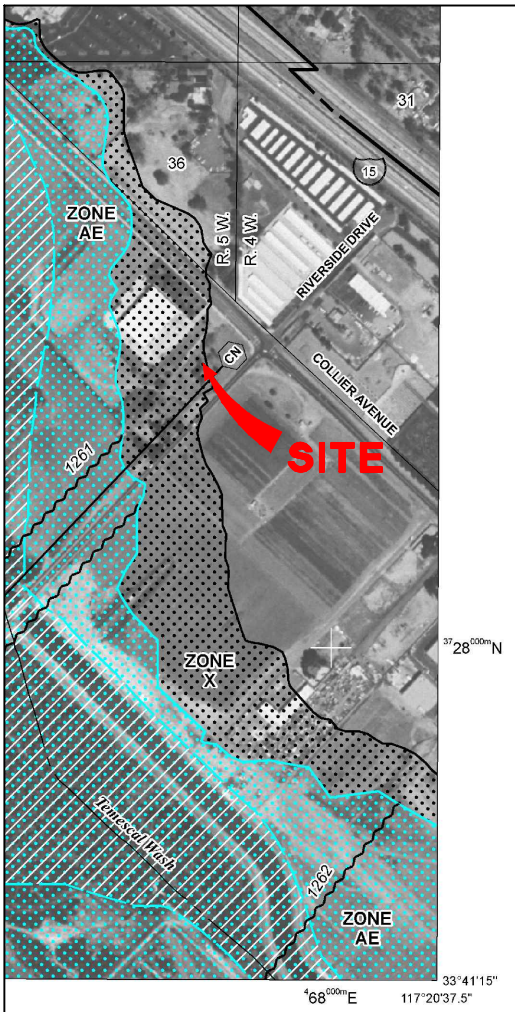


FIGURE 5

NOT TO SCALE



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS 150 0 150 300

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2028G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 2028 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAKE ELSINORE, CITY OF	060636	2028	G
RIVERSIDE COUNTY	060245	2028	G

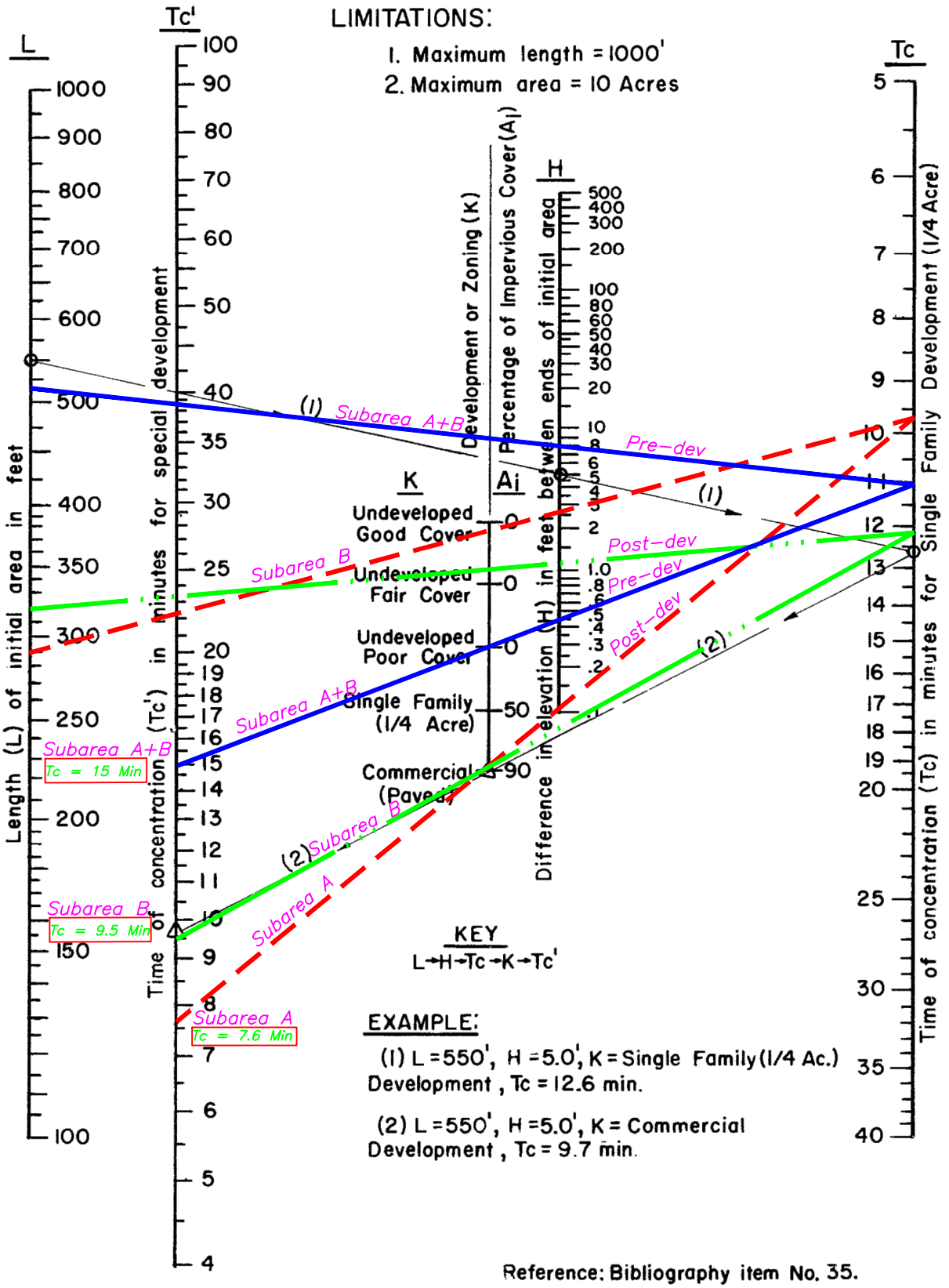
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C2028G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

FIGURE 6
FLOOD INSURANCE RATE MAP (FIRM)
NOT TO SCALE



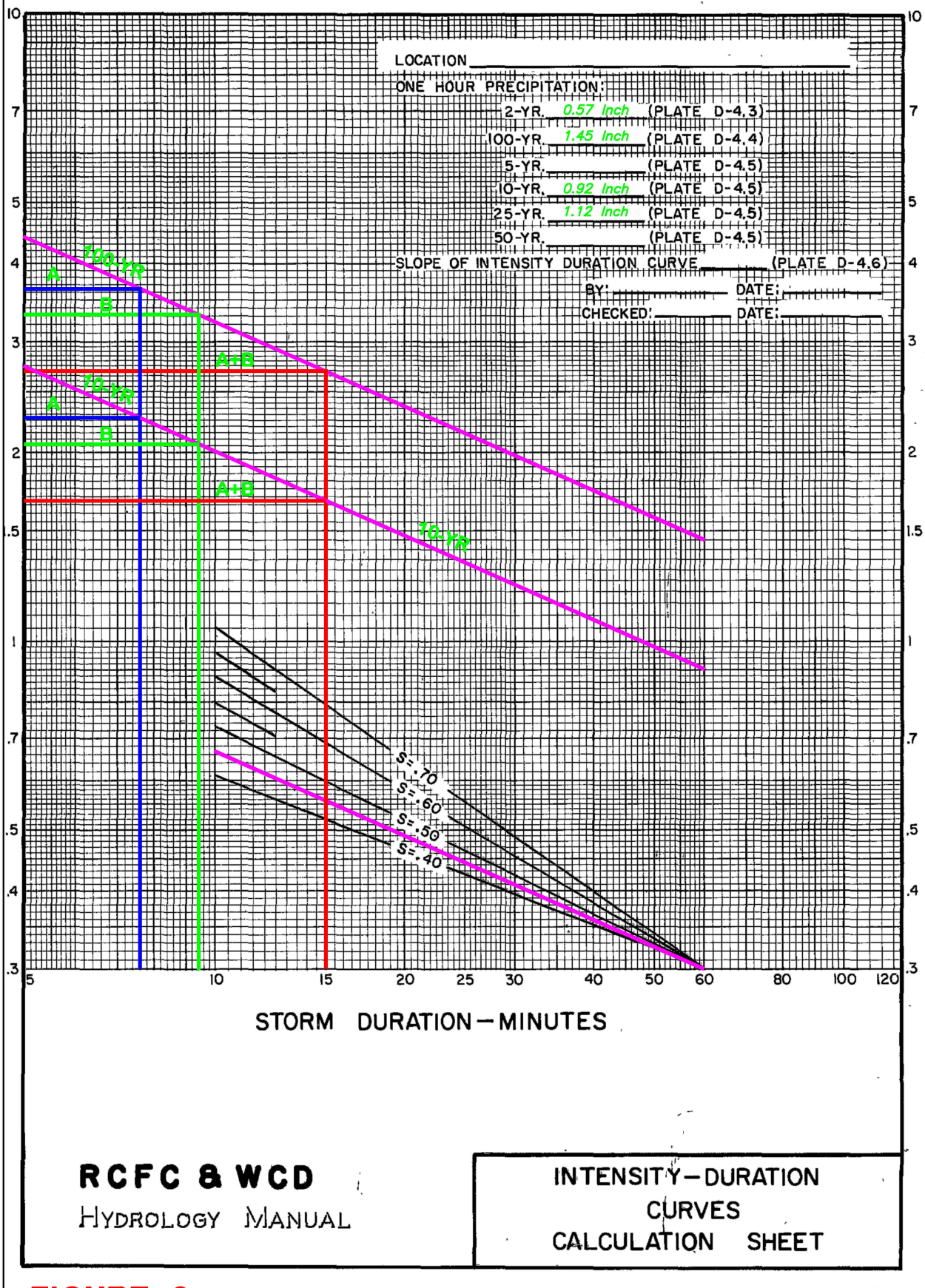
Reference: Bibliography item No. 35.

RCFC & WCD
HYDROLOGY MANUAL

TIME OF CONCENTRATION
FOR INITIAL SUBAREA

FIGURE 7

PLATE D-3



100-YR
I=3.65"/hr
I=3.30"/hr
I=2.82"/hr

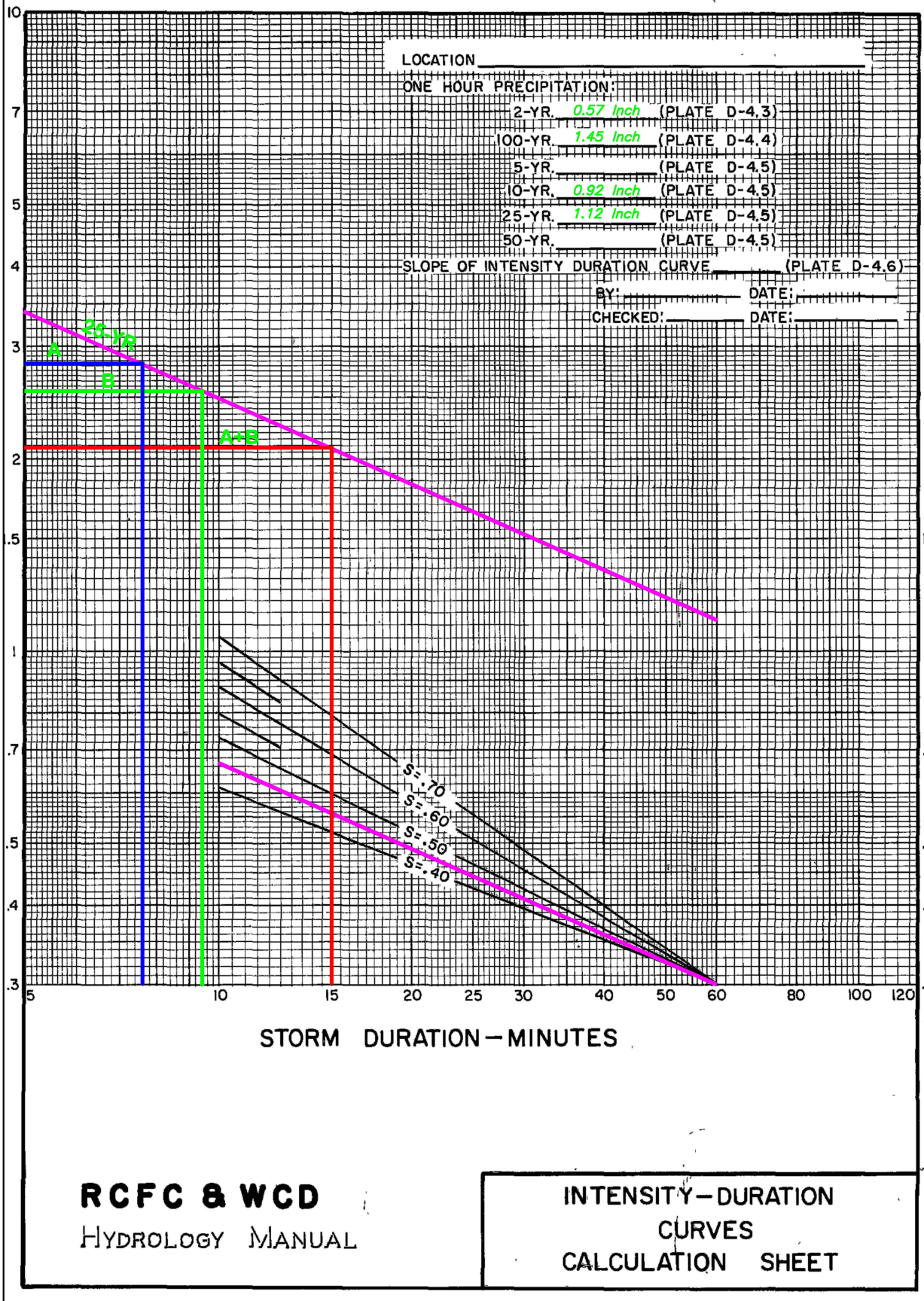
10-YR
I=2.26"/hr
I=2.06"/hr
I=1.67"/hr

RCFC & WCD
HYDROLOGY MANUAL

INTENSITY-DURATION
CURVES
CALCULATION SHEET

FIGURE 8-a

PLATE D-4.7



25-YR
I=2.82"/hr
I=2.55"/hr
I=2.08"/hr

RCFC & WCD
HYDROLOGY MANUAL

INTENSITY — DURATION
CURVES
CALCULATION SHEET

FIGURE 8-b

PLATE D-4.7

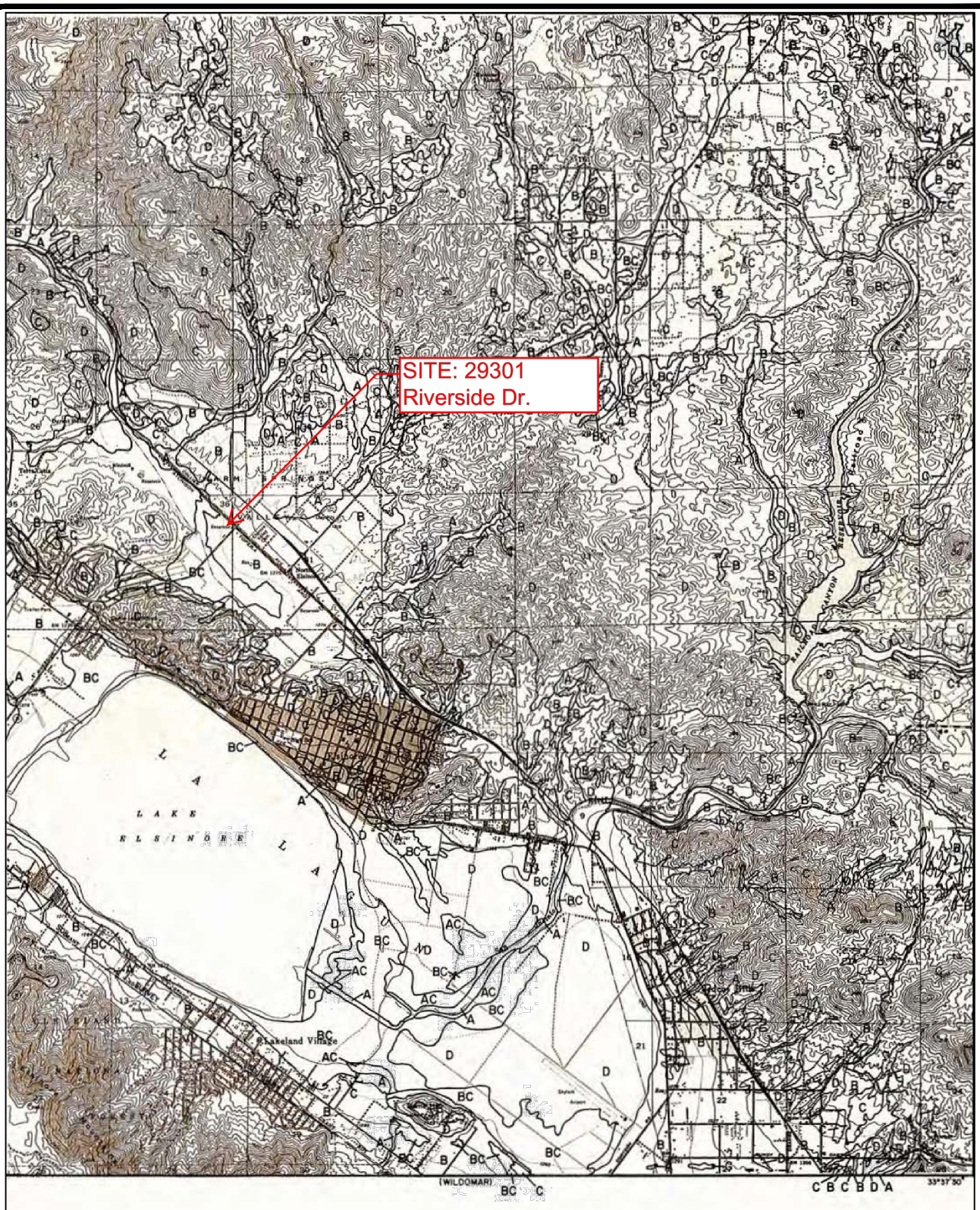
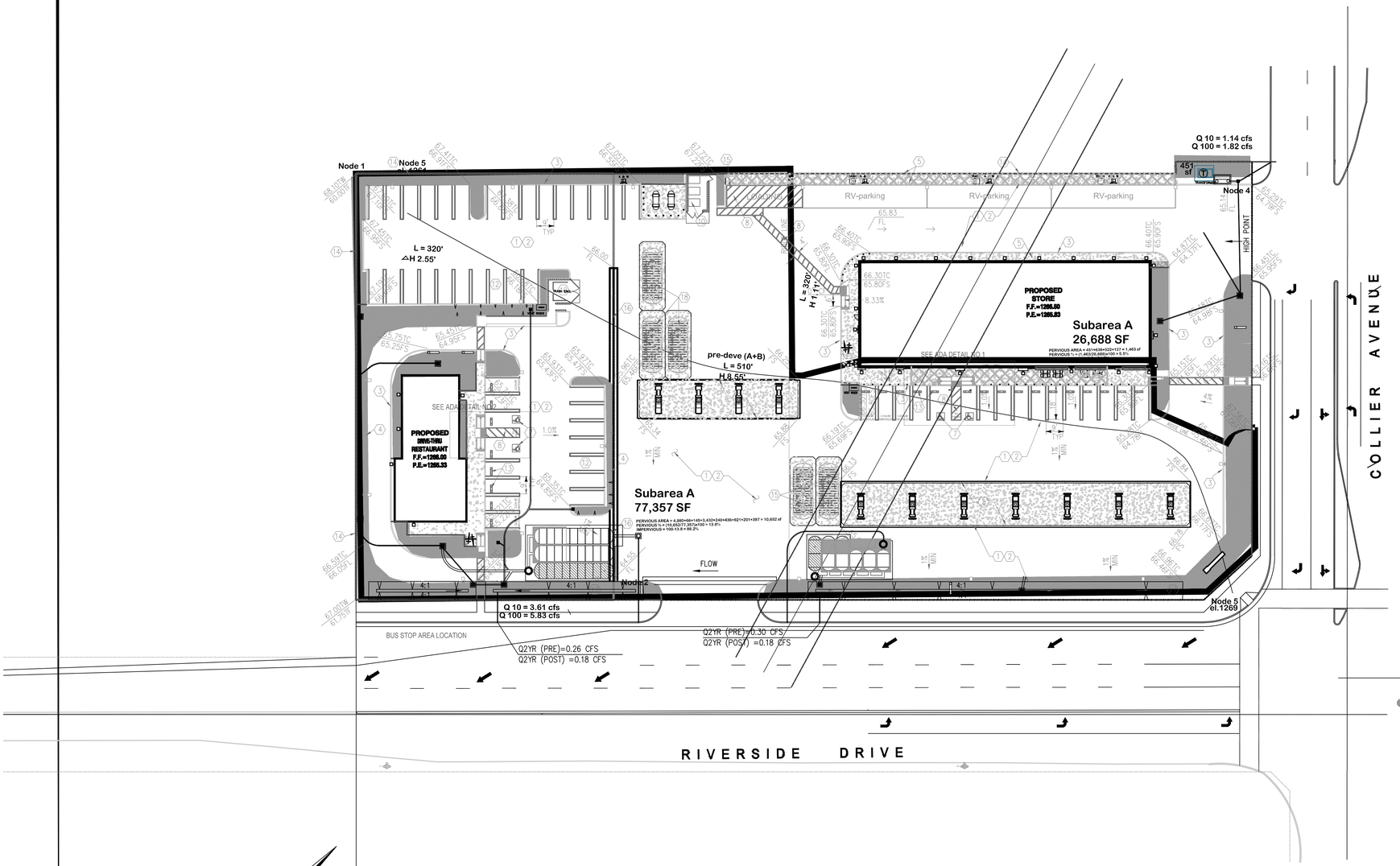

SITE: 29301
Riverside Dr.
LAKE
ELSINORE
Lakeland Village
(WILDOMAR)
LEGEND
SOILS GROUP BOUNDARY
A SOILS GROUP DESIGNATION
RCFC&WCD
HYDROLOGY MANUAL
0 FEET 5000
HYDROLOGIC SOILS GROUP MAP
FOR
ELSINORE
PLATE C-1.41

FIGURE 9



LEGEND

- BLDG./PAVED AREA
- LANDSCAPE
- (17) CONSTRUCTION NOTES (SEE ATTACHED GRADING PLAN)
- (A) OUTLET PIPE, 4" PVC SDR 35

GRAPHIC SCALE

30 0 15 30 60 90

(IN FEET)

1 inch = 30 ft.

Underground Service Alert

Call: TOLL FREE 1-800 227-2600

TWO WORKING DAYS BEFORE YOU DIG

REVISIONS

SEAL: REGISTERED PROFESSIONAL ENGINEER — MOKSUDUR RAHMAN — No. C69263 — Exp. 6-30-18 — CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:

RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:

MOKSUDUR RAHMAN
R.C.E. NO. 36117 EXP. DATE :

ACCEPTED BY:

DATE:

SCALE

Horizontal

1" =30'

Vertical

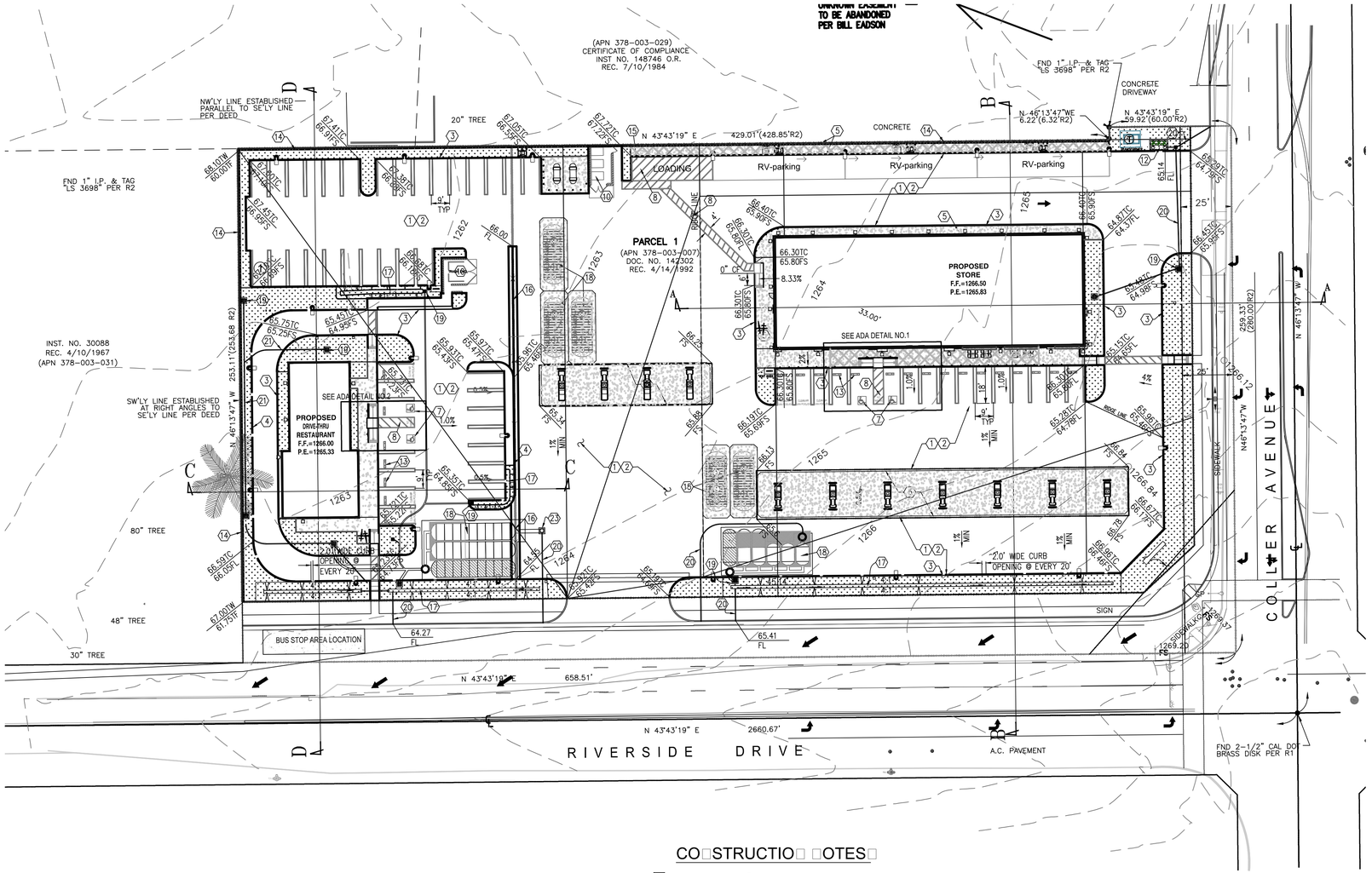
N/A

CITY OF LAKE ELSINORE

HYDROLOGIC SUBAREAS

THE KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CA 92530

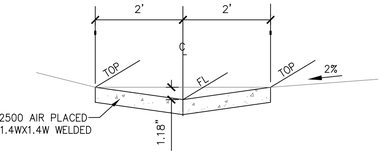
1 OF 1 SHEETS



CONSTRUCTION NOTES

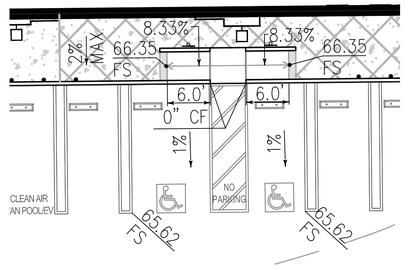
1. CONSTRUCT 3" AC PAVEMENT OR PER SOILS ENGINEER RECOMMENDATIONS
2. CONSTRUCT 6" A.B OR PER SOILS ENGINEER RECOMMENDATIONS
3. CONSTRUCT TYPE 6A CURB PER CITY OF LAKE ELSINORE STD. DWG 202
4. CONSTRUCT TYPE 6 INTERGRAL CURB & GUTTER PER CITY OF LAKE ELSINORE STD. DWG 200
5. CONSTRUCT 4" CONCRETE SLAB/WALKWAY
6. PAINT 4" WHITE SOLID PARKING STRIPES
7. PAINT PAVEMENT ADA MARKING SYMBOL SIGNS
8. PAINT PAVEMENT ADA BLUE HATCH (VAN ACCESSIBLE)
9. INSTALL HANDICAPPED PARKING SIGN
10. CONSTRUCT TRASH ENCLOSURE PER ARCHITECTURAL PLANS.
11. REMOVE EXISTING TREES
12. CONSTRUCT 4'x8' MODULAR WETLAND SYSTEM (MWS-LINEAR) BY BIOCLEAN OR APPROVED EQUAL
13. CONSTRUCT 4' LONG CONCRETE WHEEL STOP
14. CONSTRUCT RETAINING WALL (UNDER SEPARATE PERMIT).
15. UNDERGROUND STORAGE TANKS (BY OYHERS)
16. CONSTRUCT RIBBON GUTTER PER DETAIL HEREON
17. CONSTRUCT BIORETENTION BASIN PER DETAIL PN SHEET 3
18. CONSTRUCT STORMTECH MC-3500 UNDERGROUND CHAMBERS OR APPROVED EQUAL PER DETAIL ON SHEET 3T 3
19. CONSTRUCT 24"x24" JENSEN GRATE INLET OR APPROVED EQUAL W/ FOSSIL FILTER
20. CONSTRUCT 4" PVC PIPE
21. CONSTRUCT 6" PVC PIPE
22. CONSTRUCT 124" PVC PIPE
23. CONSTRUCT 24"x24" JENSEN CONC. MANHOLE OR APPROVED EQUAL W/ FOSSIL FILTER

GRAPHIC SCALE
30 0 15 30 60 90
(IN FEET)
1 inch = 30 ft.



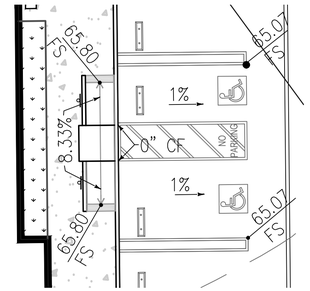
RI□□O□ GUTTER DET□IL

NOT TO SCALE



□D□ DET□IL □O□1

SCALE: 1"=10'



□D□ DET□IL □O□2

SCALE: 1"=10'

NOTE:

1. NO WORK SHALL COMMENCE WITHIN THE ROAD RIGHT OF WAY WITHOUT ISSUANCE OF ENCROACHMENT PERMIT BY TRANSPORTATION DEPARTMENT.
2. SEE STREET IMPROVEMENT PLANS FOR IMPROVEMENTS ALONG RIVERSIDE DRIVE AMD COLLIER AVENUE.

Underground Service Alert
Call: TOLL FREE 1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK
RIVERSIDE COUNTY FLOOD CONTROL DISTRICT BENCHMARK
DESIGNATION: Z 12924
ELEVATION: 1266.57
DESC: FOUND NAIL AND RCFC & WCD TAG FLUSH IN PAVEMENT ON LAKESHORE DRIVE 88 FEET ± EASTERLY OF K-RAILS ON LAKESHORE EASTERLY OF OUTLET

REVISIONS

SEAL: REGISTERED PROFESSIONAL ENGINEER — MOKSUDUR RAHMAN — No. C69263 — Exp. 6-30-20 — CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:
RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:
MOKSUDUR RAHMAN
R.C.E. NO. 36117 EXP. DATE : 6-30-20
ACCEPTED BY:
DATE:

SCALE
Horizontal
1" = 40'
Vertical
N/A

CITY OF LAKE ELSINORE

CONCEPTUAL GRADING PLAN THE KASSAB TRAVEL CENTER 29301 RIVERSIDE DRIVE LAKE ELSINORE, CA 92530

2 OF 3 SHEETS

C:\Land Projects 2004\RRF\2017-PROJECTS\RRF\MR ENGINEERING\KASSAB TRAVEL CENTER\RRF\GRADING\KASSAB-GP-V3.dwg 1-03-19 01:28:32 PM

APPENDICES

APPENDIX A-SOIL COVER TYPE

APPENDIX A

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

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RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

PLATE D-5.5 (1 of 2)

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

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IMPERVIOUS COVER FOR DEVELOPED AREAS

PLATE D-5.6

RUNOFF COEFFICIENT CURVE DATA

The data in the following tables may be used to develop runoff coefficient (C) curves for any combination of runoff index (RI) number and antecedent mositure condition (AMC). For an RI number with an AMC of II (from Plate D-5.5) enter the tables on the following pages and plot the "C" curve data directly on Plate D-5.8. "C" curve data is given for even RI numbers only, but values may easily be interpolated for odd RI numbers.

For an AMC of I or III enter the tabulation on this page with the RI for AMC II, and read the appropriate RI for AMC I or III. Use this revised RI to enter the tables on the following pages to determine "C". For example if RI = 40 for AMC II, then RI = 22 for AMC I and RI = 60 for AMC III.

AMC ADJUSTMENT RELATIONSHIPS

RI FOR AMC II	RI FOR OTHER AMC CONDITIONS: AMC I	AMC III	RI FOR AMC II	RI FOR OTHER AMC CONDITIONS: AMC I	AMC III
10	--	22	55	35	74
11	--	24	56	36	75
12	--	25	57	37	75
13	--	27	58	38	76
14	--	28	59	39	77
15	--	30	60	40	78
16	--	31	61	41	78
17	--	33	62	42	79
18	--	34	63	43	80
19	--	36	64	44	81
20	--	37	65	45	82
21	10	38	66	46	82
22	10	39	67	47	83
23	11	41	68	48	84
24	11	42	69	50	84
25	12	43	70	51	85
26	12	44	71	52	86
27	13	46	72	53	86
28	14	47	73	54	87
29	14	49	74	55	88
30	15	50	75	57	88
31	16	51	76	58	89
32	16	52	77	59	89
33	17	53	78	60	90
34	18	54	79	62	91
35	18	55	80	63	91
36	19	56	81	64	92
37	20	57	82	66	92
38	21	58	83	67	93
39	21	59	84	68	93
40	22	60	85	70	94
41	23	61	86	72	94
42	24	62	87	73	95
43	25	63	88	75	95
44	25	64	89	76	96
45	26	65	90	78	96
46	27	66	91	80	97
47	28	67	92	81	97
48	29	68	93	83	98
49	30	69	94	85	98
50	31	70	95	87	98
51	31	70	96	89	99
52	32	71	97	91	99
53	33	72	98	94	99
54	34	73	99	97	--

APPENDIX B-RUNOFF COEFFICIENT

APPENDIX B

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RUNOFF COEFFICIENT
CURVE DATA

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 84

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.60	.72	.77	.80	.82	.83	.84	.85	.86	.86
5.	.04	.61	.73	.78	.80	.82	.83	.84	.85	.86	.87
10.	.09	.63	.74	.78	.81	.83	.84	.85	.85	.86	.87
15.	.13	.64	.75	.79	.81	.83	.84	.85	.85	.86	.87
20.	.18	.66	.75	.80	.82	.83	.84	.85	.86	.87	.87
25.	.22	.67	.76	.80	.82	.84	.85	.85	.86	.87	.87
30.	.27	.69	.77	.81	.83	.84	.85	.86	.86	.87	.87
35.	.31	.70	.78	.82	.83	.85	.85	.86	.87	.87	.88
40.	.36	.72	.79	.82	.84	.85	.86	.86	.87	.87	.88
45.	.40	.73	.80	.83	.84	.85	.86	.87	.87	.88	.88
50.	.45	.75	.81	.83	.85	.86	.86	.87	.87	.88	.88
55.	.49	.76	.82	.84	.85	.86	.87	.87	.88	.88	.88
60.	.54	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
65.	.58	.79	.84	.85	.86	.87	.88	.88	.88	.88	.89
70.	.63	.81	.85	.86	.87	.88	.88	.88	.88	.89	.89
75.	.67	.82	.85	.87	.87	.88	.88	.88	.89	.89	.89
80.	.72	.84	.86	.87	.88	.88	.89	.89	.89	.89	.89
85.	.76	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
90.	.81	.87	.88	.89	.89	.89	.89	.89	.89	.90	.90
95.	.86	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 86

10-Yr Rainfall

100-Yr Rainfall

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.63	.74	.79	.81	.83	.84	.85	.85	.86	.87
5.	.04	.64	.75	.79	.82	.83	.84	.85	.86	.86	.87
10.	.09	.65	.76	.80	.82	.84	.85	.85	.86	.87	.87
15.	.13	.67	.76	.80	.83	.84	.85	.86	.86	.87	.87
20.	.18	.68	.77	.81	.83	.84	.85	.86	.86	.87	.87
25.	.22	.70	.78	.81	.83	.85	.85	.86	.87	.87	.88
30.	.27	.71	.79	.82	.84	.85	.86	.86	.87	.87	.88
35.	.31	.72	.80	.83	.84	.85	.86	.87	.87	.88	.88
40.	.36	.74	.80	.83	.85	.86	.86	.87	.87	.88	.88
45.	.40	.75	.81	.84	.85	.86	.87	.87	.87	.88	.88
50.	.45	.76	.82	.84	.86	.86	.87	.87	.88	.88	.88
55.	.49	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
60.	.54	.79	.84	.85	.86	.87	.88	.88	.88	.89	.89
65.	.58	.80	.84	.86	.87	.87	.88	.88	.88	.89	.89
70.	.63	.82	.85	.87	.87	.88	.88	.88	.89	.89	.89
75.	.67	.83	.86	.87	.88	.88	.88	.89	.89	.89	.89
80.	.72	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
85.	.76	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
90.	.81	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
95.	.86	.89	.89	.89	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 88

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.66	.76	.80	.82	.84	.85	.86	.86	.87	.87
5.	.04	.67	.77	.81	.83	.84	.85	.86	.86	.87	.87
10.	.09	.68	.78	.81	.83	.85	.85	.86	.86	.87	.88
15.	.13	.70	.78	.82	.84	.85	.86	.86	.87	.87	.88
20.	.18	.71	.79	.82	.84	.85	.86	.86	.87	.87	.88
25.	.22	.72	.80	.83	.84	.85	.86	.87	.87	.88	.88
30.	.27	.73	.80	.83	.85	.86	.86	.87	.87	.88	.88
35.	.31	.74	.81	.84	.85	.86	.87	.87	.87	.88	.88
40.	.36	.76	.82	.84	.85	.86	.87	.87	.88	.88	.88
45.	.40	.77	.82	.85	.86	.87	.87	.88	.88	.88	.89
50.	.45	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
55.	.49	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
60.	.54	.80	.84	.86	.87	.88	.88	.88	.88	.89	.89
65.	.58	.82	.85	.87	.87	.88	.88	.88	.89	.89	.89
70.	.63	.83	.86	.87	.87	.88	.88	.88	.89	.89	.89
75.	.67	.84	.87	.88	.88	.88	.89	.89	.89	.89	.89
80.	.72	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
85.	.76	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
90.	.81	.88	.89	.89	.89	.89	.90	.90	.90	.90	.90
95.	.86	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 90

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.69	.78	.82	.84	.85	.86	.86	.87	.87	.88
5.	.04	.70	.79	.82	.84	.85	.86	.87	.87	.88	.88
10.	.09	.71	.80	.83	.84	.85	.86	.87	.87	.88	.88
15.	.13	.73	.80	.83	.85	.86	.86	.87	.87	.88	.88
20.	.18	.74	.81	.84	.85	.86	.87	.87	.87	.88	.88
25.	.22	.75	.81	.84	.85	.86	.87	.87	.88	.88	.88
30.	.27	.76	.82	.84	.86	.86	.87	.87	.88	.88	.88
35.	.31	.77	.82	.85	.86	.87	.87	.88	.88	.88	.89
40.	.36	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
45.	.40	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
50.	.45	.80	.84	.86	.87	.87	.88	.88	.88	.89	.89
55.	.49	.81	.85	.86	.87	.88	.88	.88	.89	.89	.89
60.	.54	.82	.85	.87	.88	.88	.88	.89	.89	.89	.89
65.	.58	.83	.86	.87	.88	.88	.89	.89	.89	.89	.89
70.	.63	.84	.87	.88	.88	.88	.89	.89	.89	.89	.89
75.	.67	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
80.	.72	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
85.	.76	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
90.	.81	.88	.89	.89	.89	.89	.90	.90	.90	.90	.90
95.	.86	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENT CURVE DATA

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 92

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.73	.81	.84	.85	.86	.87	.87	.87	.88	.88
5.	.04	.74	.81	.84	.85	.86	.87	.87	.88	.88	.88
10.	.09	.75	.82	.84	.86	.86	.87	.87	.88	.88	.88
15.	.13	.76	.82	.85	.86	.87	.87	.88	.88	.88	.89
20.	.18	.76	.83	.85	.86	.87	.87	.88	.88	.88	.89
25.	.22	.77	.83	.85	.86	.87	.87	.88	.88	.88	.89
30.	.27	.78	.83	.85	.87	.87	.88	.88	.88	.89	.89
35.	.31	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
40.	.36	.80	.84	.86	.87	.88	.88	.88	.88	.89	.89
45.	.40	.81	.85	.86	.87	.88	.88	.88	.89	.89	.89
50.	.45	.82	.85	.87	.88	.88	.88	.89	.89	.89	.89
55.	.49	.82									
60.	.54	.83									
65.	.58	.84	.87	.88	.88	.89	.89				
70.	.63	.85	.87	.88	.89	.89	.89	.89	.89	.89	.89
75.	.67	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
80.	.72	.87	.88	.89	.89	.89	.89	.89	.89	.90	.90
85.	.76	.87	.89	.89	.89	.89	.89	.90	.90	.90	.90
90.	.81	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
95.	.86	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

10-Yr Rainfall

100-Yr Rainfall

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 94

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.77	.83	.85	.86	.87	.88	.88	.88	.88	.89
5.	.04	.78	.83	.85	.87	.87	.88	.88	.88	.89	.89
10.	.09	.78	.84	.86	.87	.87	.88	.88	.88	.89	.89
15.	.13	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
20.	.18	.80	.84	.86	.87	.88	.88	.88	.89	.89	.89
25.	.22	.80	.85	.86	.87	.88	.88	.88	.89	.89	.89
30.	.27	.81	.85	.87	.87	.88	.88	.89	.89	.89	.89
35.	.31	.81	.85	.87	.88	.88	.88	.89	.89	.89	.89
40.	.36	.82	.86	.87	.88	.88	.89	.89	.89	.89	.89
45.	.40	.83	.86	.87	.88	.88	.89	.89	.89	.89	.89
50.	.45	.83	.86	.88	.88	.89	.89	.89	.89	.89	.89
55.	.49	.84	.87	.88	.88	.89	.89	.89	.89	.89	.89
60.	.54	.85	.87	.88	.89	.89	.89	.89	.89	.89	.89
65.	.58	.85	.88	.88	.89	.89	.89	.89	.89	.89	.90
70.	.63	.86	.88	.89	.89	.89	.89	.89	.89	.90	.90
75.	.67	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
80.	.72	.87	.89	.89	.89	.89	.90	.90	.90	.90	.90
85.	.76	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
90.	.81	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
95.	.86	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 96

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.81	.85	.87	.88	.88	.88	.89	.89	.89	.89
5.	.04	.81	.85	.87	.88	.88	.88	.89	.89	.89	.89
10.	.09	.82	.86	.87	.88	.88	.89	.89	.89	.89	.89
15.	.13	.82	.86	.87	.88	.88	.89	.89	.89	.89	.89
20.	.18	.83	.86	.87	.88	.88	.89	.89	.89	.89	.89
25.	.22	.83	.86	.88	.88	.89	.89	.89	.89	.89	.89
30.	.27	.84	.87	.88	.88	.89	.89	.89	.89	.89	.89
35.	.31	.84	.87	.88	.88	.89	.89	.89	.89	.89	.89
40.	.36	.85	.87	.88	.89	.89	.89	.89	.89	.89	.90
45.	.40	.85	.87	.88	.89	.89	.89	.89	.89	.89	.90
50.	.45	.85	.88	.88	.89	.89	.89	.89	.89	.90	.90
55.	.49	.86	.88	.89	.89	.89	.89	.89	.89	.90	.90
60.	.54	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
65.	.58	.87					89				
70.	.63	.87					90				
75.	.67	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
80.	.72	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
85.	.76	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
90.	.81	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
95.	.86	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

10-Yr Rainfall

100-Yr Rainfall

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 98

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.85	.88	.88	.89	.89	.89	.89	.89	.90	.90
5.	.04	.86	.88	.88	.89	.89	.89	.89	.89	.90	.90
10.	.09	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
15.	.13	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
20.	.18	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
25.	.22	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
30.	.27	.87	.88	.89	.89	.89	.89	.90	.90	.90	.90
35.	.31	.87	.88	.89	.89	.89	.89	.90	.90	.90	.90
40.	.36	.87	.89	.89	.89	.89	.90	.90	.90	.90	.90
45.	.40	.87	.89	.89	.89	.89	.90	.90	.90	.90	.90
50.	.45	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
55.	.49	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
60.	.54	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
65.	.58	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
70.	.63	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
75.	.67	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
80.	.72	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
85.	.76	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
90.	.81	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
95.	.86	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

APPENDIX C-DESIGN CALCULATIONS

Subarea A

Hydraulic Analysis Report

Project Data

Project Title:

Designer:

Project Date: Sunday, December 31, 2017

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width: 3.0000 ft

Longitudinal Slope: 0.0300 ft/ft

Manning's n: 0.0130

Flow: 4.5100 cfs

Result Parameters

Depth: 0.2253 ft

Area of Flow: 0.6758 ft^2

Wetted Perimeter: 3.4505 ft

Hydraulic Radius: 0.1958 ft

Average Velocity: 6.6739 ft/s

Top Width: 3.0000 ft

Froude Number: 2.4780

Critical Depth: 0.4125 ft

Critical Velocity: 3.6445 ft/s

Critical Slope: 0.0046 ft/ft

Critical Top Width: 3.00 ft

Calculated Max Shear Stress: 0.4217 lb/ft^2

Calculated Avg Shear Stress: 0.3666 lb/ft^2

Subarea B

Hydraulic Analysis Report

Project Data

Project Title:

Designer:

Project Date: Tuesday, January 02, 2018

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Circular

Pipe Diameter: 0.3300 ft

Longitudinal Slope: 0.0500 ft/ft

Manning's n: 0.0090

Flow: 0.5000 cfs

Result Parameters

Depth: 0.2306 ft

Area of Flow: 0.0638 ft^2

Wetted Perimeter: 0.6534 ft

Hydraulic Radius: 0.0977 ft

Average Velocity: 7.8319 ft/s

Top Width: 0.3028 ft

Froude Number: 3.0057

Critical Depth: 0.3251 ft

Critical Velocity: 5.8639 ft/s

Critical Slope: 0.0317 ft/ft

Critical Top Width: 0.08 ft

Calculated Max Shear Stress: 0.7196 lb/ft^2

Calculated Avg Shear Stress: 0.3049 lb/ft^2

Appendix I

Project Specific Water Quality Management Plan

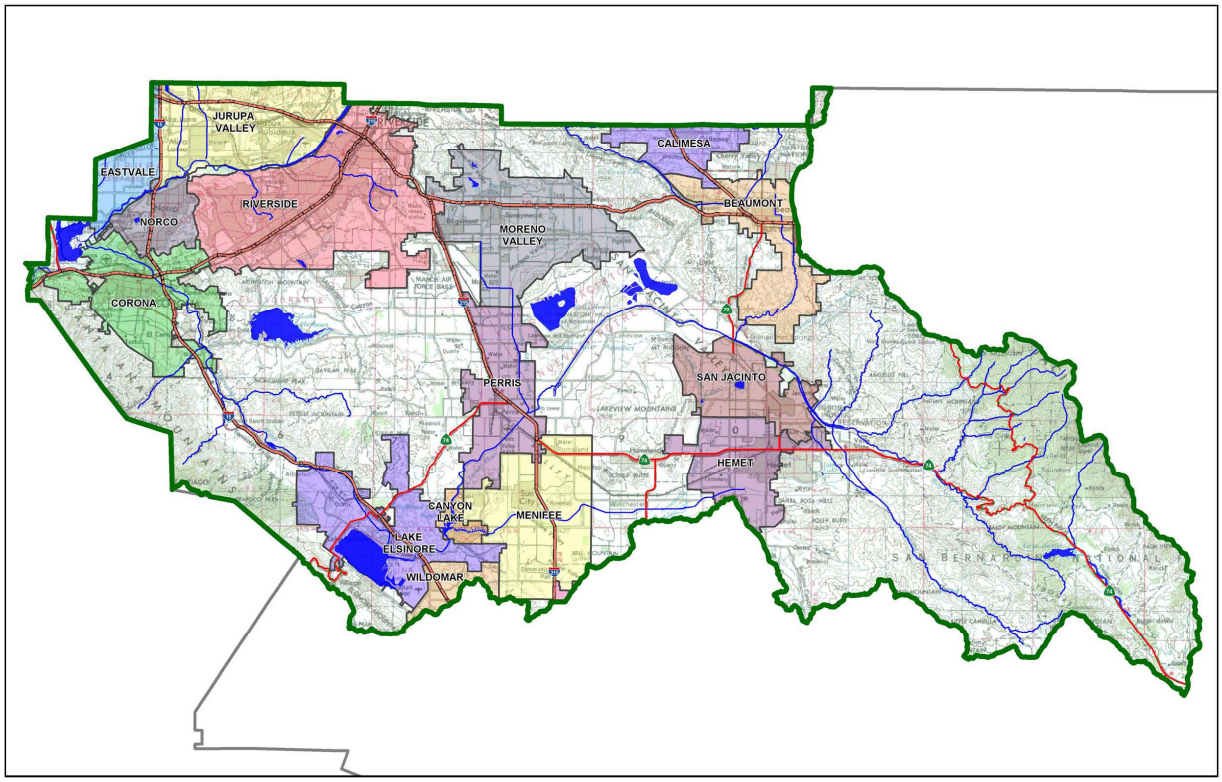
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: KASSAB TRAVEL CENTER

Development No: PA-2016-00112

Design Review/Case No: PWQMP-2018-00001



☒ **Preliminary**
☐ **Final**

Original Date Prepared: JULY 15, 2017

Revision Date(s): October 4, 2018
December 27, 2018

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

Contact Information:

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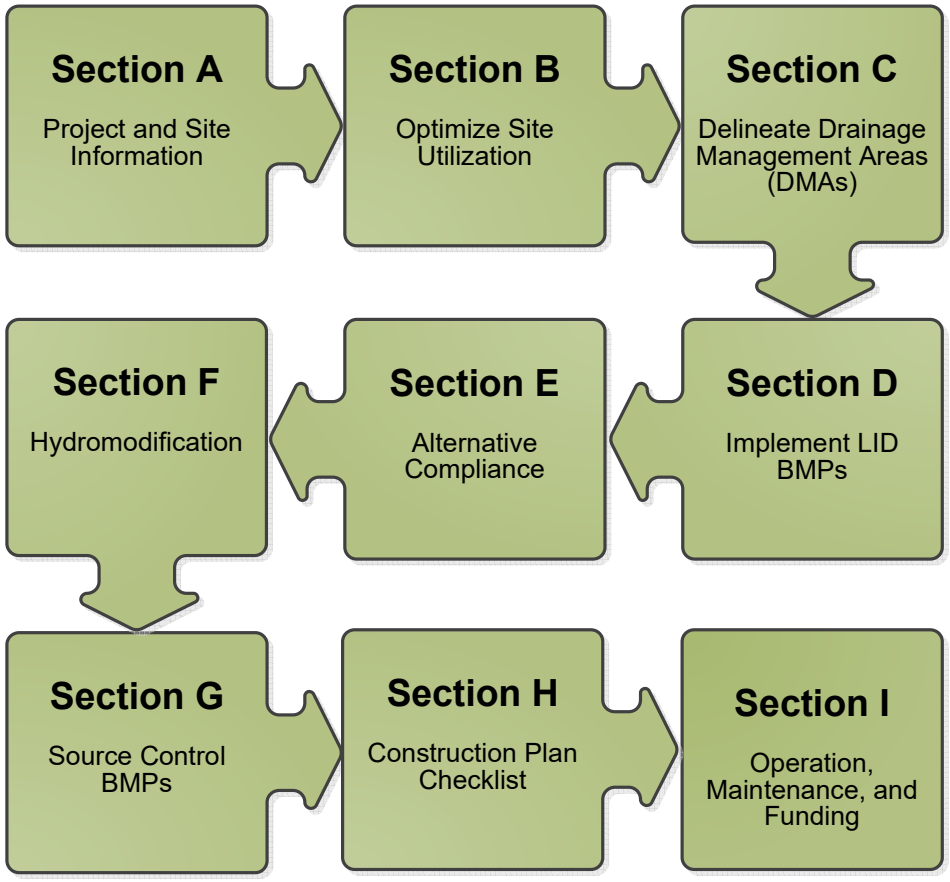
6939 SCHAEFFER RD, STE D-170
CHINO, CA., 91710
TEL; (213) 400-8078

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Ron Kassab by Moksud Rahman, PE for the Kassab Travel Center facility project.

This WQMP is intended to comply with the requirements of CITY OF LAKE ELSINORE for ORD. # (Municipal Code Section 754.2), which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under CITY OF LAKE ELSINORE Water Quality Ordinance (Municipal Code Section 754.2).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

↗Owner's Signature

12/21/2018

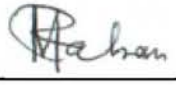
Date

Ron Kassab

Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."



Preparer's Signature

Date:

Moksudur Rahman , PE

Professional Civil Engineer

Preparer's Licensure: PE C69263

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	COMMERCIAL
Planning Area:	I-15 CORRIDOR
Community Name:	LAKE ELSINORE
Development Name:	I-15 CORRIDOR/ NORTH ELSINORE
PROJECT LOCATION	
Latitude & Longitude (DMS): LAT: 33º 41' 41.65" Long: 117º 20' 49.64"	
Project Watershed and Sub-Watershed: Santa Ana River , Temescal Reach	
APN(s): 378-030-007 & 009	
Map Book and Page No.: Page 866 Grid C1 & C2	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Commercial
Proposed or Potential SIC Code(s)	
Area of Impervious Project Footprint (SF)	92,011 SF
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	92,011 SF
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	0
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	N/A
What is the Water Quality Design Storm Depth for the project?	0.70

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
TEMESCAL WASH	PH, INDICATOR BACTERIA	REC1, REC2, WARM, WILD	RARE (5.4 MILES)
SANTA ANA RIVER	COPPER, LEAD, PATHOGENS, INDICATOR BACTERIA, PATHOGENS	AGR, GWR, REC1, REC2, WARM, WILD, RARE	RARE

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☐ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* City of Lake Elsinore Grading permit City of Lake Elsinore Building permit	☒ Y	☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

NO. EXISTING DRAINAGE PATTERN WAS NOT PRESERVE BECAUSE ADJACENT PROPERTIES WOULD NOT ALLOW TO ACCEPT THE INCREASE RUNOFF SO PROJECT WAS DESIGN TO FLOW TOWARDS THE LANDSACPE AREAS THEN OUT TO THE STREETS.

Did you identify and protect existing vegetation? If so, how? If not, why?

NO. WHOLE SITE WILL BE DEVELOPED.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

YES, BY CONCENTRATING THE DEVELOPMENT ON PORTIONS OF THE SITE WITH LESS PERMEABLE SOIL AND PRESERVE THE SITE THAT CAN PROMOTE INFILTRATION. SOME LANDSCAPE AREAS ARE CONSIDERED SELF TREATING AREAS WHICH PRESERVE NATURAL INFILTRATION AND SOME AREAS BIORETENTION BMP WILL BE CONSTRUCTED.

Did you identify and minimize impervious area? If so, how? If not, why?

YES, BY INCORPORATING LANDSCAPE AREAS TO MINIMIZE IMPERVIOUS AREAS

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

YES, ALL DRAINAGE FLOWS WILL BE CAPTURED BY THE PROPOSED RIBBON GUTTERS TOWARDS TO THE PROPOSED BMPS.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DMA "A"	Mixed type (A.C pavement, landscape	27,456	TYPE "D"
DMA "B"	Mixed type (A.C pavement, landscape, Roof)	26,397	TYPE "D"
DMA "C"	Landscape	1,457	TYPE "A"
DMA "D"	Mixed type (A.C pavement, landscape	5,536	TYPE "D"
DMA "E"	Mixed type (A.C pavement, landscape	3,383	TYPE "D"
DMA "F"	Mixed type (A.C pavement, landscape, roof)	4,697	TYPE "D"
DMA "G"	Mixed type (A.C pavement, landscape	5,672	TYPE "D"
DMA "H"	Mixed type (A.C pavement, landscape	29,939	TYPE "D"

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA "C"	1,457	GRASS VEGETATION	SPRINKLER SYSTEM

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name / ID	[C] from Table C.4 =	Required Retention Depth (inches)
		[A]	[B]		[C]	[D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product		Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]	DMA name /ID	[D]	[C]/[D]

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA A	LANDSCAPE AREAS/BIORETENTION
DMA B	BIOFILTRATION (PROPRIETARY)
DMA D	BIORETENTION
DMA E	LANDSCAPE AREAS
DMA F	LANDSCAPE AREAS
DMA G	BIORETENTION
DMA H	LANDSCAPE AREAS/BIORETENTION

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: A, B, D, G & H	X	
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment –

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: _____0.29 ac_____

Type of Landscaping (Conservation Design or Active Turf): ___CONSERVATION DESIGN

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 0.25ac

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: 1.32

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: _____0.33_____AC

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	**Available Irrigated Landscape (Step 1)**
_____0.33_____AC	_____0.29_____ AC

Note: The proposed project cannot meet or exceed the minimum ratio, therefore Harvest and use is not feasible.

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: ____35_____

Project Type: COMMERCIAL

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 0.25 AC

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 150

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: _____37.5_____

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
_____37.5_____	_____35__

Note: The proposed project cannot meet or exceed the minimum demand, therefore Harvest and use is not feasible.

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

N/A

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: N/A

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: N/A

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: N/A

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required useN/A

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
N/A	N/A

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

X LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA A	☐	☐	☒	☐	☐
DMA B	☐	☐	☐	☒	☐
	☐	☐	☐	☐	☐
DMA D	☐	☐	☒	☐	☐
DMA E	☐	☐	☒	☐	☐
DMA F	☐	☐	☒	☐	☐
DMA G	☐		☒		
DMA H			☒		

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Insert narrative description here.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Enter BMP Name / Identifier Here*** ***BIO-RETENTION NO.1***		
	[A]		[B]	[C]	[A] x [C]			
DMA A	*27,456*	*MIXED TYPE*	*0.86*	*0.67*	*18,396*	*Design Storm Depth (in)*	*Design Capture Volume,* ***V_{BMP}*** *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	27,456				18,396	0.70	1080.30	1,140

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

NOTE: THE DMA RUMOFF FACTOR WAS AUTOMATICALLY CALCULATED FRPM THE WORKSHEET FOR CALCULATING THE VOLUME bmp, SEE APPENDIX 6.

						Modular wetlands		
DMA B	26,327	MIXED TYPE	0.96	0.82	21,588	0.70	1267.7	1500

						BIORETENTION		
DMA D	5,536	MIXED TYPE	1.0	0.89	4,927	0.70	288.10	312

+

						BIORETENTION		
DMA E	3,383	A.C PVMT	0.42	0.29	981.07	0.70	60.80	176

						BIORETENTION		
DMA F	4,697	A.C PVMT	0.64	0.44	2066.60	0.70	120.8	121

						BIORETENTION		
DMA G	5,612	A.C PVMT	0.62	0.42	2357	0.70	139.0	176

						BIORETENTION		
DMA H	29,939	MIX TYPE	0.95	.81	24,251	0.70	1409.30	1410

IMPERVIOUS FRACTION CALCULATION

A. DMA-A

TOTAL AREA = 0.63 AC
A.C PAVEMENT = 0.53 AC
LANDSCAPING = 0.10 AC

If= (0.63)(1.0) + (0.53)(1.0) + (0.10)(0.10) / 0.63

IMPERVIOUS FRACTION (If) = 0.86

B. DMA-B

TOTAL AREA = 0.61AC
A.C PAVEMENT and ROOF= 0.58 AC
LANDSCAPING = 0.03 AC

If= (0.58)(1.0) + (0.03)(0.10) /0.61

IMPERVIOUS FRACTION (If) = 0.96

C. DMA-D

TOTAL AREA = 0.12 AC
A.C PAVEMENT=0.12 AC

If= (0.12)(1.0) / 0.12

IMPERVIOUS FRACTION (If) = 1.0

D. DMA-E

TOTAL AREA = 0.11AC
A.C PAVEMENT=0.04
LANDSCAPING = 0.07AC

If= (0.04)(1.0)+(0.07)(0.10) / 0.11

IMPERVIOUS FRACTION (If) = 0.42

E. DMA-F

TOTAL AREA = 0.11 AC
A.C PAVEMENT AND ROOF=0.07

If= 0.07)(1.0) / 0.11

IMPERVIOUS FRACTION (If) = 0.64

F. DMA-G

TOTAL AREA = 0.13 AC
A.C PAVEMENT =0.11
LANDSCAPING = 0.02AC

If= 0.11)(1.0)+(0.02)(0.1) / 0.13

IMPERVIOUS FRACTION (If) = 0.62

G. DMA-H

TOTAL AREA = 0.69 AC
A.C PAVEMENT AND ROOF=0.65
LANDSCAPING=0.04 AC

If= 0.65)(1.0)+(0.04)(0.10) / 0.69

IMPERVIOUS FRACTION (If) = 0.95

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address some of the Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

List DMAs here.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☒ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☒ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☒	☒	☐	☐	☐	☐	☐	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
Total Credit Percentage[1]	

[1]Cannot Exceed 50%

[2]Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Area x Runoff Factor**		***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12

[H] is from the Total Credit Percentage as Calculated from Table E.2 above

[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
Modular Wetlands	Bacterial Indicators, Metals, Trash & Debris	90%

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.
[2] Cross Reference Table E.1 above to populate this column.
[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	N/A	N/A	N/A
Volume (Cubic Feet)	N/A	N/A	N/A

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

HCOC IS MITIGATED BY ACHIEVING CONDITION C. DISCHARGE FROM THE SITE WAS LIMITED TO A FLOW RATE NOT GREATER THAN 10% OF THE PRE-DEVELOPED 2 YEAR PEAK FLOW. SEE APPENDIX 7 FOR SUPPORTING CALCULATIONS.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm Drain Inlets	*Mark all Inlets " Only Rain Down the storm drain*	*-Maintain and periodically repaint or replace inlet markings* *-Provide stormwater pollution prevention information to new site owners, lessees or operators* *-Include in Lease agreement: "Tenant shall not allow anyone to discharge anything to storm drains or store or deposit materials so as to create a potential discharge to storm drains".*
Landscape/Outdoor Pesticide Use	*Design Landscaping to Minimize Irrigation and Runoff, to promote*	*Maintain Landscaping using minimum or no pesticides.*

	surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution	
Parking lots, sidewalks, plazas		*Sweep parking lots regularly to prevent accumulation of liter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer and not to storm drain.* *Sweep plazas, sidewalks and parking lots regularly to prevent accumulation of liter and debris. Collect debris from presuure washing to prevent entry to storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to sanitary sewer not to storm drain.*
Roofings, Gutters & Trims	Avoid roofing. Gutters & trim made of copper and other unprotected metals that may leach into runoff.	

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)
BMP NO.1	LANDSCAPE AREA/BIORETENTION	SHT 2 OF GRADING PLANS
BMP NO. 2	BIOCLEAN MODULAR WETLANDS	SHT 2 OF GRADING PLANS
BMP NO.3	LANDSCAPE	SHTC 2 OF GRADING PLAN
BMP NO.4	BIORETENTION	SHT 2 OF GRADING PLAN
BMP NO.5	LANDSCAPE AREA	SHT 2 OF GRADING PLAN
BMP NO.6	LANDSCAPE AREA	SHT 2 OF GRADING PLANS
BMP NO.7	BIORETENTION	SHT 2 OF GRADING PLAN
BMP NO.8	LANDSCAPE AREA/BIORETENTION	SHT 2 OF GRADING PLAN

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: Insert text here.

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

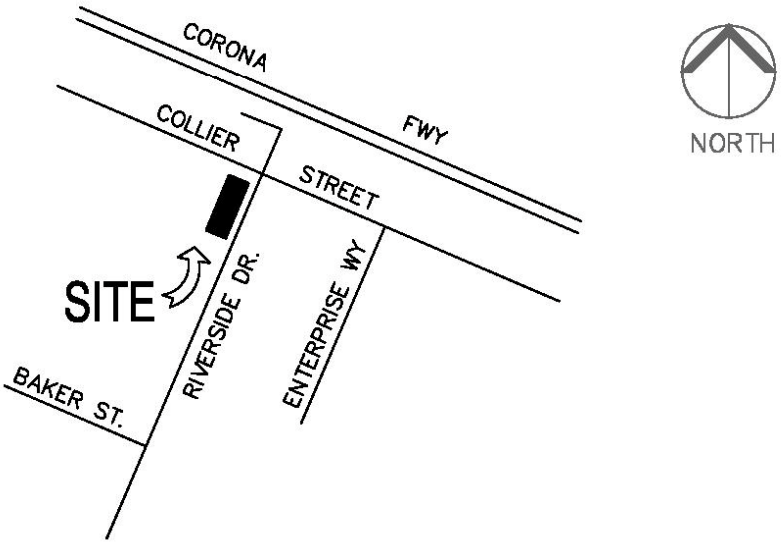
☒ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

THIS SECTION WILL BE ADDRESSED AND COMPLETED AT THE TIME OF FINAL WQMP SUBMITTAL.

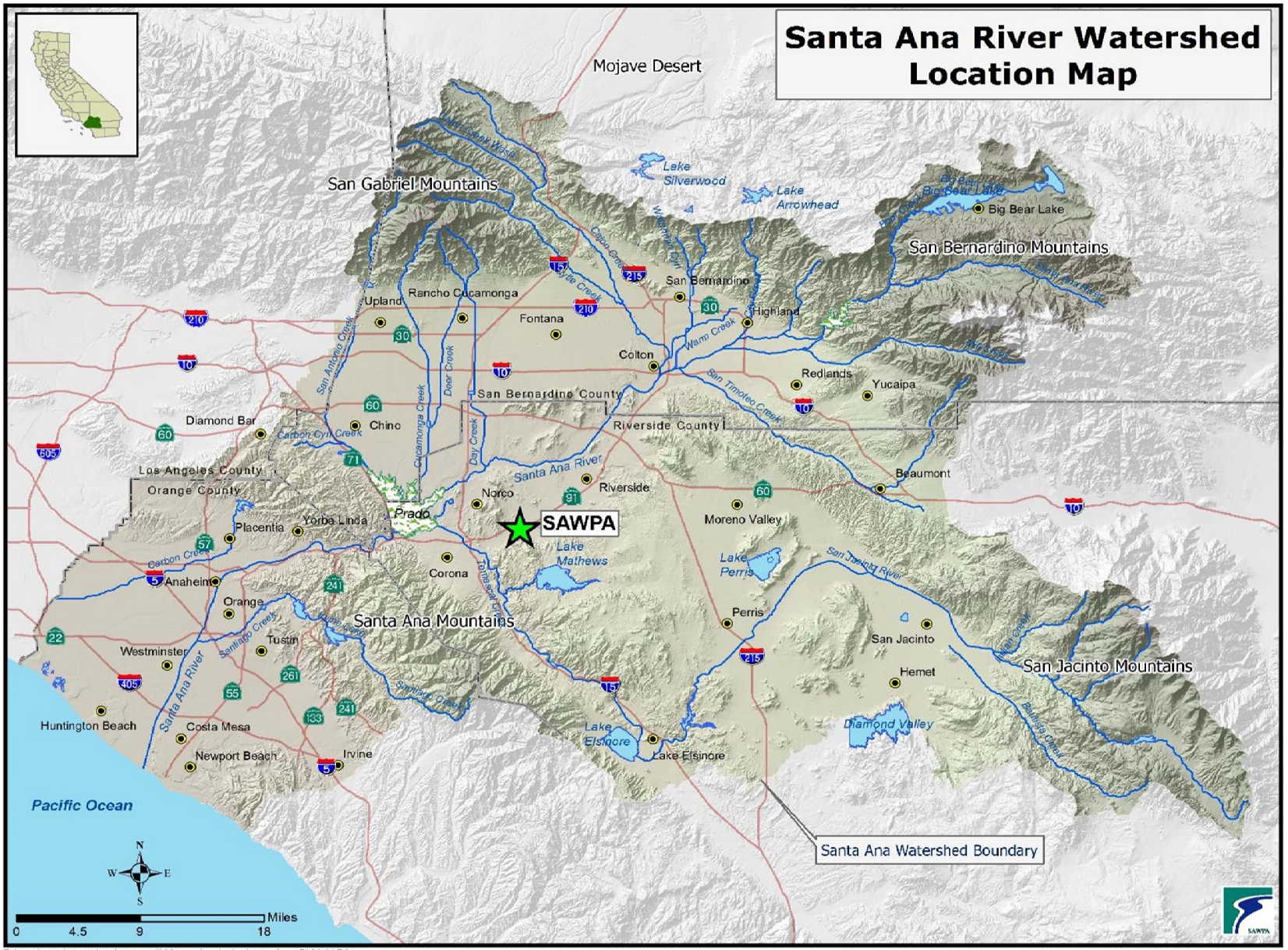
Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map



VICINITY MAP:

NOT TO SCALE


Santa Ana River Watershed
Location Map
Mojave Desert
San Gabriel Mountains
San Bernardino Mountains
San Jacinto Mountains
Santa Ana Mountains
Lake Silverwood
Lake Arrowhead
Big Bear Lake
Rancho Cucamonga
Upland
Fontana
San Bernardino
Highland
Colton
Redlands
Yucaipa
San Bernardino County
Riverside County
Los Angeles County
Orange County
Diamond Bar
Chino
Norco
Riverside
Prado
SAWPA
Lake Mathews
Lake Perris
Moreno Valley
Beaumont
Placentia
Yorba Linda
Corona
Anaheim
Orange
Tustin
Westminster
Perris
San Jacinto
Hemet
Huntington Beach
Costa Mesa
Newport Beach
Irvine
Lake Elsinore
Diamond Valley
Pacific Ocean
Santa Ana River
Santa Ana Watershed Boundary
N
W
E
S
Miles
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4.5
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18
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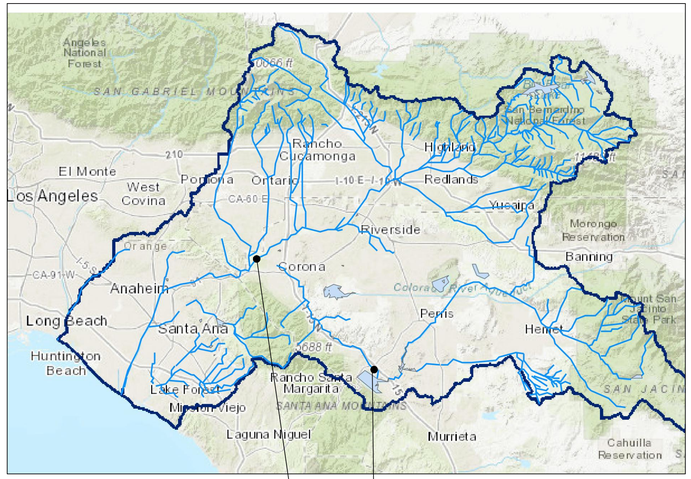
□ □□ □MP SITE PL□□



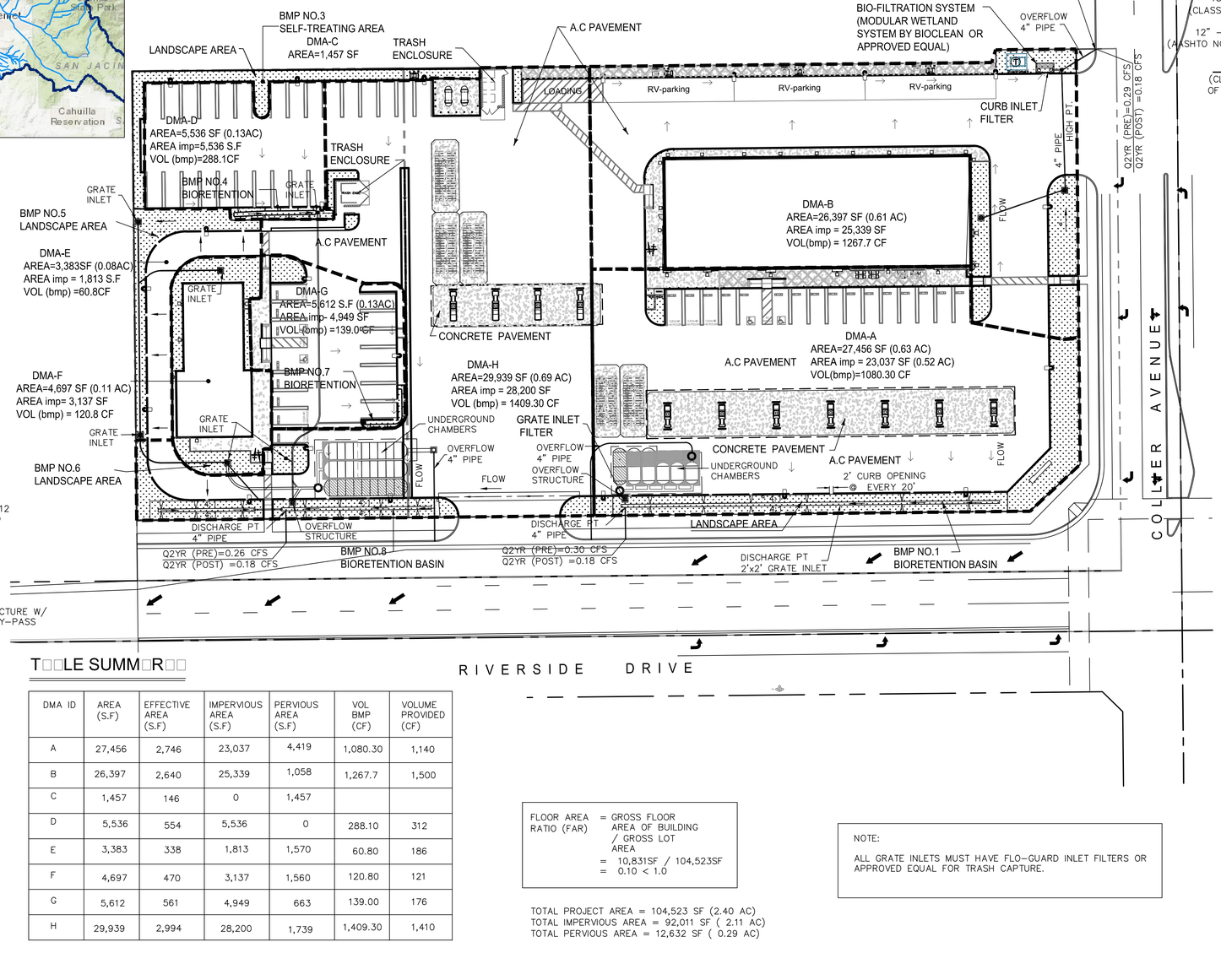
LOCATION MAP

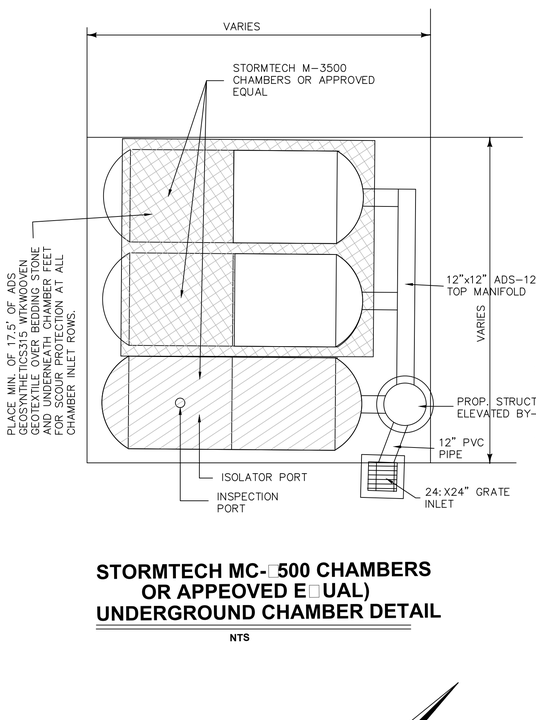
NTS

LEGE□D OR □E□ TO S□M□OLS

- PROPERTY LINE
- PROPOSED SLOPE
- 1950 — PROPOSED ELEV.
- (1940) — EXISTING ELEV.
- DRAINAGE FLOW
- DRAINAGE BOUNDARY

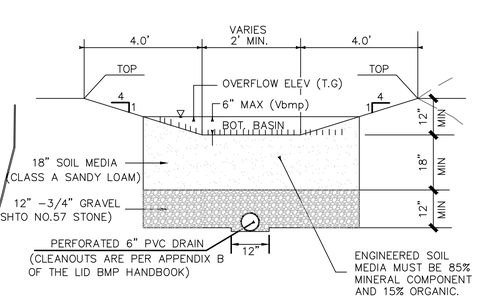
FULL TRASH CAPTURE DEVICES:
1. CURB INLET FILTER
2. FLO-GUARD GRATE INLET INSERTS





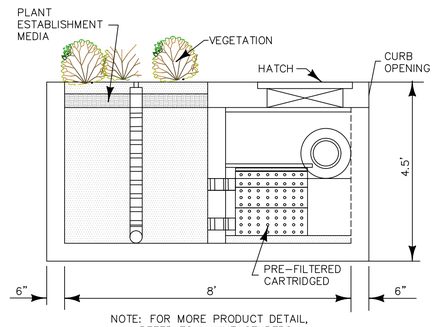
STORMTECH MC-□500 CHAMBERS OR APPEOVED E□UAL) UNDERGROUND CHAMBER DETAIL

NTS



TYPICAL BIORETENTION DETAIL

NTS



NOTE: FOR MORE PRODUCT DETAIL, REFER TO MANUFACTURERS STD, DETAILS

BIOCLEAN MODULAR WETLAND SYSTEM

NTS

T□□LE SUMM□R□□

DMA ID	AREA (S.F)	EFFECTIVE AREA (S.F)	IMPERVIOUS AREA (S.F)	PERVIOUS AREA (S.F)	VOL. BMP (CF)	VOLUME PROVIDED (CF)
A	27,456	2,746	23,037	4,419	1,080.30	1,140
B	26,397	2,640	25,339	1,058	1,267.7	1,500
C	1,457	146	0	1,457		
D	5,536	554	5,536	0	288.10	312
E	3,383	338	1,813	1,570	60.80	186
F	4,697	470	3,137	1,560	120.80	121
G	5,612	561	4,949	663	139.00	176
H	29,939	2,994	28,200	1,739	1,409.30	1,410

FLOOR AREA RATIO (FAR) = GROSS FLOOR AREA OF BUILDING / GROSS LOT AREA
= 10,831SF / 104,523SF
= 0.10 < 1.0

TOTAL PROJECT AREA = 104,523 SF (2.40 AC)
TOTAL IMPERVIOUS AREA = 92,011 SF (2.11 AC)
TOTAL PERVIOUS AREA = 12,632 SF (0.29 AC)

NOTE:

ALL GRATE INLETS MUST HAVE FLO-GUARD INLET FILTERS OR APPROVED EQUAL FOR TRASH CAPTURE.

SOURCE CO□TROL □MP□S

NON- STRUCTURAL SOURCE BMP
EDUCATION OF PROPERTY OWNERS, TENANTS, AND OCUPANYS ON STORMWATER BMP'S
SPILL CONTINGENCY PLAN
HAZARDOUS MATERIAL DISCLOSUE COMPIANCE
UNIFORM FIRE CODE IMPLEMENTATION
LITER/DEBRIS CONTROL PTOGRAM
EMPLOYEE TRAINING
VACUUM SWEEPING OF PRIVATE STREETS AND PARKIBG LOTS.
OTHER NON STRUCTURAL MEASURES FOR PUBLIC AGENCY PROJECTS.
COMPLY WITH ALL NPDES PERMITS.

STRUCTURAL SOURCE BMP
DESIGN AND CONSTRUCT TRASH AND AND WASTE STORAGE TO REDUCE POLLUTION INTRODUCTION.
USE EFFICIENT IRRIGATION SYSTEM AND LANDSCAPE DESIGN, WATER CONSERVATION.
FINISH GRADE OF LANDSCAPE AREAS IS 1" TO 2' BELOW TOP OF CURB, SIDEWALK OR PAVEMENT.
MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES
SWEEP PARKING LOTS REGILARLY TO PREVENT ACCUMULATION OF TRASH AND DEBRIS
MARK INLETS "ONLY RAIN DOWN THE STORM DRAIN".

GRAPHIC SCALE
30 0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

Underground Service Alert
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1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK
RIVERSIDE COUNTY FLOOD CONTROL DISTRICT BENCHMARK
DESIGNATION: Z 12924
ELEVATION: 1266.57
DESC: FOUND NAIL AND RCFC & WCD TAG FLUSH IN PAVEMENT ON LAKESHORE DRIVE .88 FEET ± EASTERLY OF K-RAILS ON LAKESHORE EASTERLY OF OUTLET

REVISIONS

SEAL: REGISTERED PROFESSIONAL ENGINEER — MOKSUDUR RAHMAN — No. C69263 — Exp. 6-30-20 — CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:
RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:
MOKSUDUR RAHMAN
R.C.E. NO. C69263 EXP. DATE :
ACCEPTED BY:
DATE:

SCALE
Horizontal
1" = 30'
Vertical
N/A

CITY OF LAKE ELSINORE

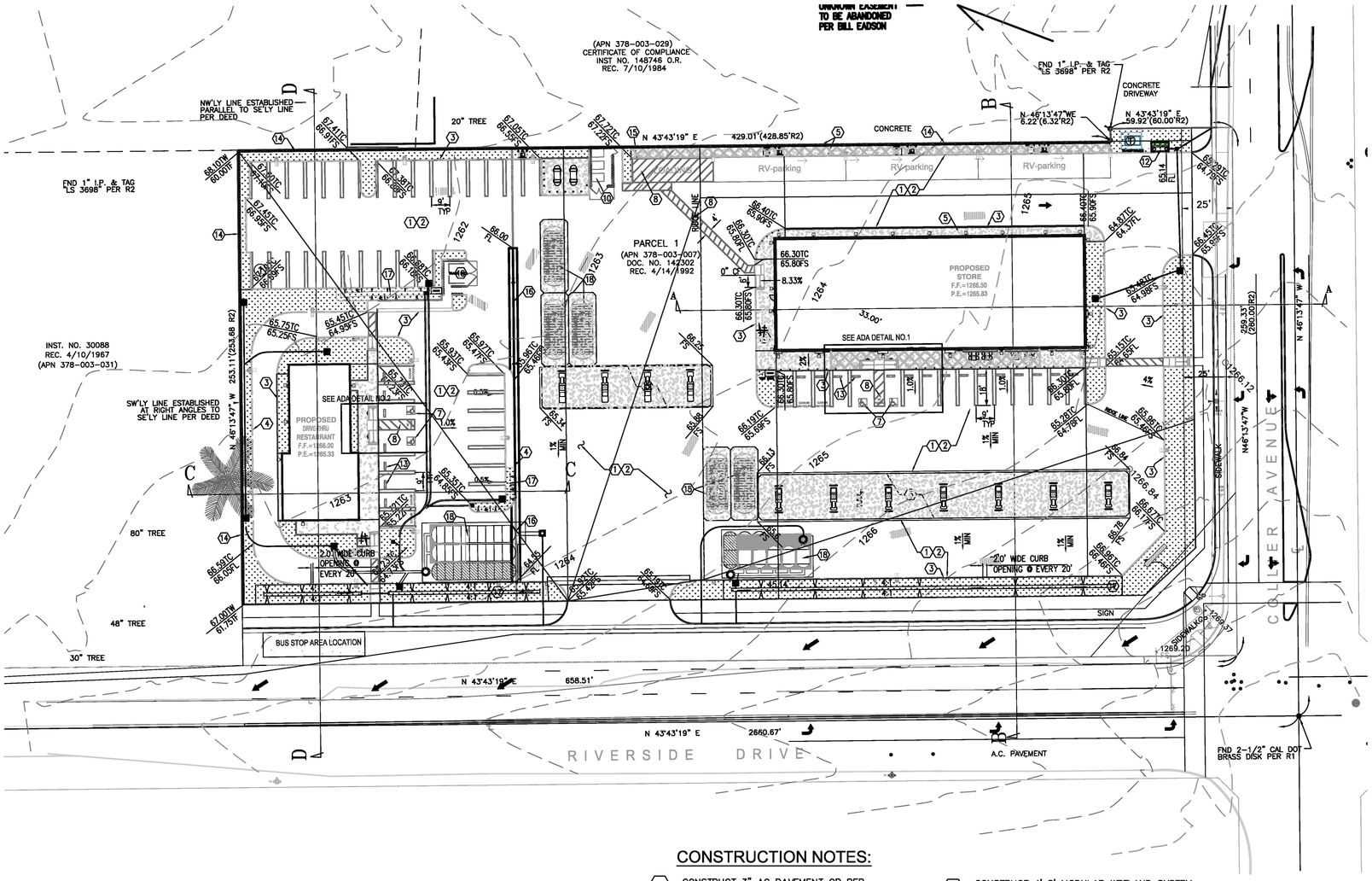
W.Q.M.P
THE KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CA 92530

1 OF 1 SHEETS

C:\Land Projects 2018\RR\2017-PROJECTS\RR\MR ENGINEERING\KASSAB TRAVEL CENTER\RR WQMP\K-WQMP SITE PLAN-V4.dwg 1-03-19 11:01:28 AM

Appendix 2: Construction Plans

Grading and Drainage Plans



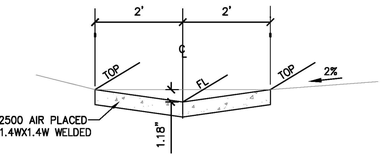
GRAPHIC SCALE

30 0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

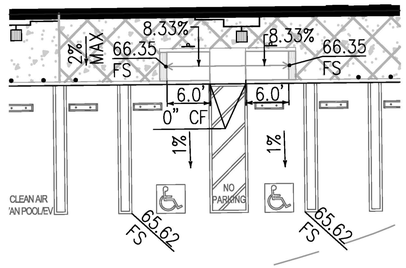
CONSTRUCTION NOTES:

1. CONSTRUCT 3" AC PAVEMENT OR PER SOILS ENGINEER RECOMMENDATIONS
2. CONSTRUCT 6" A.B OR PER SOILS ENGINEER RECOMMENDATIONS
3. CONSTRUCT TYPE 6A CURB PER CITY OF LAKE ELSINORE STD. DWG 202
4. CONSTRUCT TYPE 6 INTERGRAL CURB & GUTTER PER CITY OF LAKE ELSINORE STD. DWG 200
5. CONSTRUCT 4" CONCRETE SLAB/WALKWAY
6. PAINT 4" WHITE SOLID PARKING STRIPES
7. PAINT PAVEMENT ADA MARKING SYMBOL SIGNS
8. PAINT PAVEMENT ADA BLUE HATCH (VAN ACCESSIBLE)
9. INSTALL HANDICAPPED PARKING SIGN
10. CONSTRUCT TRASH ENCLOSURE PER ARCHITECTURAL PLANS.
11. REMOVE EXISTING TREES
12. CONSTRUCT 4'x8' MODULAR WETLAND SYSTEM (MWS-LINEAR) BY BIOCLEAN OR APPROVED EQUAL
13. CONSTRUCT 4' LONG CONCRETE WHEEL STOP
14. CONSTRUCT RETAINING WALL (UNDER SEPARATE PERMIT).
15. UNDERGROUND STORAGE TANKS (BY OYHERS)
16. CONSTRUCT RIBBON GUTTER PER DETAIL HEREON
17. CONSTRUCT BIORETENTION BASIN PER DETAIL PN SHEET 3
18. CONSTRUCT STORMTECH MC-3500 UNDERGROUND CHAMBERS OR APPROVED EQUAL PER DETAIL ON SHEET 3T 3
19. CONSTRUCT 24"x24" JENSEN GRATE INLET OR APPROVED EQUAL



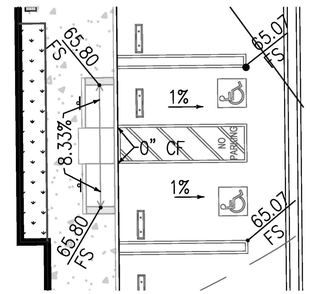
RIBBON GUTTER DETAIL

NOT TO SCALE



ADA DETAIL NO.1

SCALE: 1"=10'



ADA DETAIL NO.2

SCALE: 1"=10'

NOTE:

1. NO WORK SHALL COMMENCE WITHIN THE ROAD RIGHT OF WAY WITHOUT ISSUANCE OF ENCROACHMENT PERMIT BY TRANSPORTATION DEPARTMENT.
2. SEE STREET IMPROVEMENT PLANS FOR IMPROVEMENTS ALONG RIVERSIDE DRIVE AMD COLLIER AVENUE.

Underground Service Alert

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1-800
227-2600

TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK

RIVERSIDE COUNTY FLOOD CONTROL
DISTRICT BENCHMARK
DESIGNATION: Z 12924
ELEVATION: 1266.57
DESC: FOUND NAIL AND RCFC & WCD
TAG FLUSH IN PAVEMENT ON LAKESHORE
DRIVE 88 FEET ± EASTERLY OF
K-RAILS ON LAKESHORE EASTERLY
OF OUTLET

REVISIONS

SEAL:

REGISTERED PROFESSIONAL ENGINEER
MOKSUDUR RAHMAN
No. C69263
Exp. 6-30-20
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED BY:

RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:

MOKSUDUR RAHMAN
R.C.E. NO. 36117 EXP. DATE : 6-30-20

ACCEPTED BY:

DATE:

SCALE

Horizontal
1" = 40'
Vertical
N/A

CITY OF LAKE ELSINORE

CONCEPTUAL GRADING PLAN
THE KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CA 92530

2 OF 3 SHEETS

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Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017
Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: **Infiltration/Percolation Testing for Stormwater Retention**
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

As requested, we have performed percolation/infiltration testing on the subject site in order to determine the infiltration potential of the surface soils. The percolation rates determined should be useful in assessing stormwater retention needs. It is our understanding that on-site stormwater retention will be required. It is proposed to collect the stormwater runoff within subsurface percolation chambers. This report presents the results of our study, discussion of our findings, and provides percolation rates for the subject system.

PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to determine the general percolation rates and physical characteristics of the onsite soils in order to provide design parameters for the proposed onsite infiltration system. Services provided for this study are in accordance with our agreement and consisted of the following:

- Site exploration consisting of the excavation and logging of three test holes;
- Percolation testing in the test holes (P-1, P-2 and P-3);
- Compilation of this report, which presents the results of our study and provides percolation rates for the design of an onsite infiltration system.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The subject property is presently occupied by a vacant land. The project consists of construction of Gas Station, RV Fueling Station and associated improvements. Further information regarding proposed development and test hole locations is shown on Figure 1, Percolation Test Holes Location Map.

FIELD INVESTIGATION

Our field investigation consisted of excavating three shallow exploratory test holes, which were also used as percolation test holes. Hollow-stem drilled equipment was utilized to excavate the exploratory test holes. An engineer logged and observed the test holes excavations. Soil classification was based on visual observation. The approximate locations of the exploratory and

percolation test holes are shown on Figure 1 (Percolation Test Holes Location Map). Logs of the exploratory test holes are presented in Appendix A.

SUBSURFACE SOILS CONDITIONS

SOIL PROFILE

The soils encountered within our test holes consisted of native soil materials. Native soils encountered within the exploratory test holes consisted primarily of sandy clay and clay. A more detailed description of these materials is provided in the exploratory test holes logs included in the enclosed Appendix A. Soils encountered were classified according to the Unified Soil Classification System (USCS).

GROUNDWATER

Groundwater was not encountered within the exploratory test holes to the maximum explored depth of 5 feet below ground surface (bgs). Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

PERCOLATION TESTING AND PROCEDURE

Percolation testing was performed to assess the general percolation rates of the onsite soils for the design of an onsite infiltration system.

The continuous pre-soak (falling-head) test procedure was utilized for testing. Water was allowed to presoak in each test hole prior to obtaining test readings. Following the presoak period, the drop in water level in each hole was monitored every 10 to 30 minutes to determine the appropriate method for testing. Test holes were refilled following each reading or when the water depth was below 6 inches. Test times ranged from 120 to 150 minutes. The drop in water level was recorded to the nearest $1/10^{th}$ inch to produce conservative water level readings.

SUMMARY OF INFILTRATION TEST RESULTS

Tests results are summarized below:

Test Hole No.	Rate (Inch/Hour)
1	1.3
2	1.4
3	1.2

Based on the obtained field data, 1.2 inches per hour should be utilized in the design of the proposed onsite drain system. The base of the system should be founded into natural soils.

It should be noted that the infiltration rates determined are ultimate rates based upon field test results. An appropriate safety factor should be applied to account for subsoil inconsistencies and potential silting of the percolating soils. The safety factor should be determined with consideration to other factors in the stormwater retention system design (particularly stormwater volume estimates) and the safety factors associated with those design components.

The Storm water Manager's Resource Center (SMRC) web site (http://www.stormwatercenter.net/) includes guidelines for disposal of storm water with respect to setback of structures. It is included in the criteria that infiltration facilities should be setback 10 feet down-gradient from structures. In order to avoid potential adversely impacting any existing structures, we recommend that any infiltration system be kept a horizontal distance of at least 10 feet from the edge of new building and the property line.

LIMITATIONS

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering and engineering geologic principals and practice within our opinion at this time in Southern California. Our conclusions and recommendations are based on the results of the field investigations, combined with an interpolation of subsurface conditions between and beyond exploration locations.

As the project evolves, our continued consultation and construction monitoring should be considered. GeoBoden should review plans and specifications to ensure the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this study are valid. Where significant design changes occur, GeoBoden may be required to augment or modify these recommendations. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and/or modified recommendations. This report was written for Client, and the design team members, and only for the proposed development described herein. We are not responsible for technical interpretations made by others, or exploratory information that has not been described or documented in this report. Specific questions or interpretations concerning our findings and conclusions may require written clarification.

We appreciate the opportunity to provide service to you on this project. If you have questions regarding this letter or the data included, please contact the undersigned.

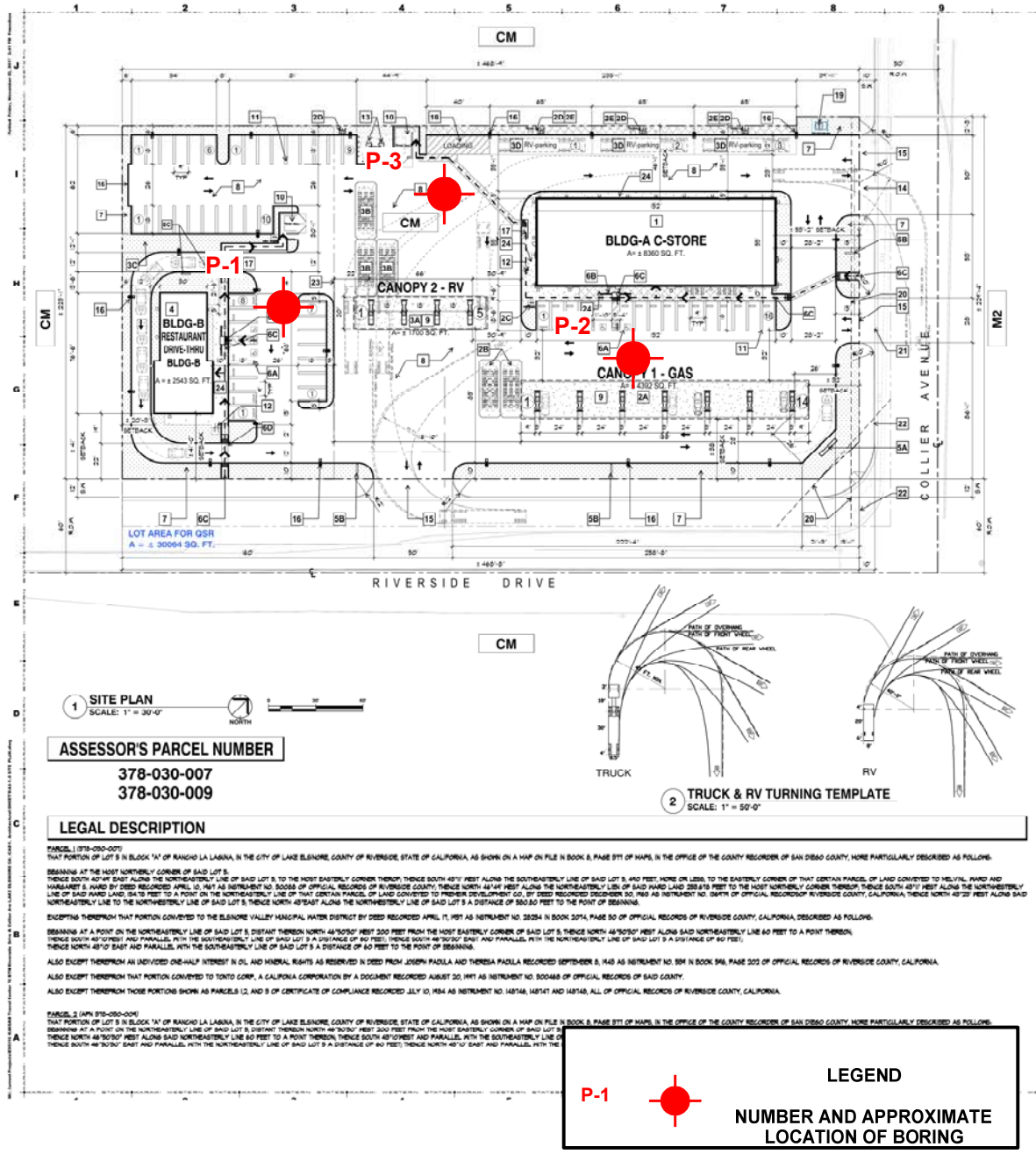
Sincerely,
GEOBODEN, INC.

Cyrus Radvar
Principal Engineer, G.E. 2742

Copies: 3/Addressee

Attachments:

Figure 1 – Percolation Test Holes Location Map
Appendix A – Test Holes Logs



ASSESSOR'S PARCEL NUMBER

378-030-007
378-030-009

LEGAL DESCRIPTION

PARCEL 1 (378-030-007)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 5;
THENCE SOUTH 40°49' EAST ALONG THE NORTHEASTERLY LINE OF SAID LOT 5, TO THE MOST EASTERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE SOUTHEASTERLY LINE OF SAID LOT 5, 440 FEET, MORE OR LESS, TO THE EASTERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO MELVIN L. WARD AND MARGARET S. WARD BY DEED RECORDED APRIL 10, 1961 AS INSTRUMENT NO. 30058 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY; THENCE NORTH 40°49' WEST ALONG THE NORTHEASTERLY LINE OF SAID WARD LAND, 284.78 FEET TO A POINT ON THE NORTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND CONVEYED TO PIONEER DEVELOPMENT CO., BY DEED RECORDED DECEMBER 30, 1960 AS INSTRUMENT NO. 138479 OF OFFICIAL RECORDSOF RIVERSIDE COUNTY, CALIFORNIA; THENCE NORTH 49°23' WEST ALONG SAID NORTHEASTERLY LINE TO THE NORTHWESTERLY LINE OF SAID LOT 5; THENCE NORTH 49°EAST ALONG THE NORTHWESTERLY LINE OF SAID LOT 5 A DISTANCE OF 550.50 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT BY DEED RECORDED APRIL 17, 1957 AS INSTRUMENT NO. 28254 IN BOOK 3074, PAGE 50 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5; THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON;
THENCE SOUTH 40°10'10" WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE NORTH 40°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN OIL AND MINERAL RIGHTS AS RESERVED IN DEED FROM JOSEPH PADILLA AND THERESA PADILLA RECORDED SEPTEMBER 8, 1948 AS INSTRUMENT NO. 594 IN BOOK 596, PAGE 202 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO TONTO CORP., A CALIFONIA CORPORATION BY A DOCUMENT RECORDED AUGUST 20, 1991 AS INSTRUMENT NO. 300468 OF OFFICIAL RECORDS OF SAID COUNTY.

ALSO EXCEPT THEREFROM THOSE PORTIONS SHOWN AS PARCELS 12, AND 9 OF CERTIFICATE OF COMPLIANCE RECORDED JULY 10, 1984 AS INSTRUMENT NO. 148746, 148747 AND 148748, ALL OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (APN 378-030-004)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5;
THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON; THENCE SOUTH 40°10' WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE
THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE NORTH 40°10' EAST AND PARALLEL WITH THE

P-1 — **LEGEND**

NUMBER AND APPROXIMATE LOCATION OF BORING

LEGEND

- NO. OF PARKING SPACES
- ACCESSIBLE PARKING
- PROPERTY LINE (BEFORE R.O.W. DEDICATION)
- PROPERTY LINE (AFTER R.O.W. DEDICATION)
- HANDICAP PATH OF TRAVEL
- CONCRETE PAVING AREA
- LANDSCAPED AREA
- DECORATIVE STAMPED CONCRETE
- WALL MOUNTED AREA LIGHTS
- DIRECTIONAL ARROW
- AREA LIGHTS
- (E) FIRE HYDRANT

SITE KEY NOTES

1 CONVENIENCE STORE
2A GAS STATION CANOPY AND FUEL DISPENSERS FOR AUTOS
2B UNDERGROUND STORAGE TANK
2C VENT RISER WITH CARBON CANISTER
2D AIR & WATER UNIT
2E TRASH BIN
3A GAS STATION CANOPY AND FUEL DISPENSERS OR R.V. & TRUCKS
3B UNDERGROUND STORAGE TANK
3C VENT RISER WITH CARBON CANISTER
3D RV PARKING W/ DUMP STATION
4 FASTFOOD WITH DRIVE-THRU
5A MONUMENT SIGN (UNDER SEPARATE PERMIT)
5B PRICE SIGN (UNDER SEPARATE PERMIT)
5C DRIVE THRU MENU BOARD SIGN
6A ACCESSIBLE PARKING (WITH WHEELCHAIR WHERE REQUIRED)
6B ACCESSIBLE PARKING SIGN
6C ADA ACCESSIBLE RAMP & TRUNCATED DOME PAVER
6D ADA ACCESSIBLE PATH STRIPING (2% MAX CROSS SLOPE)
7 LANDSCAPE WITH 6" CONCRETE CURB
8 ASPHALT PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
9 CONCRETE PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
10 TRASH ENCLOSURE (PER CITY STANDARD WHERE APPLICABLE)
11 PARKING STRIPING AS PER CITY STANDARDS (WITH WHEELCHAIR WHERE REQUIRED)
12 BIKE PARKING RACK
13 PROPANE TANK
14 (E) DRIVEWAY TO REMOVE, CONSTRUCT (N) SIDEWALK PER CITY STANDARDS
15 (N) DRIVEWAY PER CITY STANDARDS NO. 108A
16 AREA LIGHTS
17 SERVICE RAMP
18 SERVICE LOADING AREA
19 PROPOSED LOCATION OF TRANSFORMER
20 (E) WATER & TELEPHONE EASEMENT
21 (E) POWER POLE (TO BE RELOCATED PER CITY R.O.W. WIDENING)
22 (E) CURB, GUTTER & SIDEWALK (TO BE RELOCATED PER CITY R.O.W. WIDENING)
23 PROPOSED NEW PARCEL LINE FOR QSR WITH DRIVE-THRU
24 CONCRETE WALKWAY

VICINITY MAP

PROJECT DATA

ZONING	C-M (COMMERCIAL MANUFACTURING)	
LAND USE	COMMERCIAL	
AREA OF SITE	± 124,045 S.F. (± 2.85 ACRES) (BEFORE R.O.W. DEDICATION) ± 104,824 S.F. (± 2.34 ACRES) (AFTER R.O.W. DEDICATION)	
BLDG SETBACKS	REQUIRED	PROPOSED
FRONT	20'-0"	20'-0" / 41'-0"
REAR	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	46'-1"
SIDE (YARD)	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	20'-9"
SIDE (STREET)	15'-0"	52'-0" / 51'-0"
LANDSCAPE AREA	12%	16.45% (± 17,140 S.F.)
FLOOR AREA RATIO	-	0.152
LOT COVERAGE	-	18.2%
MAXIMUM HEIGHT	45'-0"	± 26'-0"
PARKING (SEE PARKING COMPUTATION BELOW)	64	75

BUILDING DATA

(N) BLDG-A CONVENIENCE STORE

AREA	± 8,360 SF
OCCUPANCY	M
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 26'-0"
FIRE SPRINKLER	YES

(N) BLDG CANOPY (FOR AUTOS)

AREA	± 4,312 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 18'-0"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG CANOPY (FOR R.V.s)

AREA	± 1,700 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 14'-8"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG-B FASTFOOD REATAURANT W/ DRIVE-THRU

AREA	± 2,543 SF
OCCUPANCY	A-2
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 22'-2"
FIRE SPRINKLER	NONE

PARKING ANALYSIS

PARKING STANDARDS

TYPE	SIZE
REGULAR	9'-0" X 18'-0"
PARALLEL	8'-0" X 23'-0"
HANDICAP	11'-0" X 18'-0" VAN ACCESSIBLE
LOADING	12'-0" X 40'-0" (TYPE-B)

PARKING REQUIREMENTS

USE	REQUIRED	PROPOSED
C-STORE (RETAIL AREA) (± 8,760 SF)	17	14 (4 CANOPIES)
FORMULA: 1 SP PER 400 SF (CM-DISTRICT)		
C-STORE (QSR AREA) (± 1,800 SF)	21	25
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		
FASTFOOD RESTAURANT	31	31
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		

HANDICAP PARKING REQUIREMENTS

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (3)		(4)

CLEAN AIR VEHICLE PARKING

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (6)		(6)

TOTAL PARKING SPACES	64	75

KARAKI WSe
WESTERN STATES ENGINEERING
A DESIGN-BUILD COMPANY
4667 E. LA PALMA STE. 707
TEL: (714)693-9300 FAX: (714)693-1002
CONSULTANT/ SEALS

SUBMITTAL
NO. DESCRIPTION BY DATE
1
2
3
4

REVISIONS
NO. DESCRIPTION BY DATE
△
△
△
△

OWNER NAME & ADDRESS
MR. RON KASSAB

PROJECT NAME & ADDRESS
THE KASSAB TRAVEL CENTER
Gas Station, RV Fueling Station
QSR w/ Drive-Thru
29301 RIVERSIDE DRIVE
LAKE ELSINORE CA 92530

NOTE TO CONTRACTOR

CONFIDENTIALITY STATEMENT

DESIGNED BY: WS
DRAWN BY: WS
CHECKED BY: JK
DATE DRAWN: 11.03.17
SCALE: 1" = 30'-0"
SHEET TITLE
SITE PLAN

BLDG SHEET NUMBER
AS-1.0
JOB No E95010
CUP No. CUP NO.

GEOBODEN INC. Geotechnical Consultants	PERCOLATION BORING LOCATION PLAN Proposed Kassab Travel Center 29301 Riverside Drive Lake Elsinore, California	Figure By S.R. Map No. XX Date 12-30-17 Project No. Lake Elsinore Figure No. 2

GEOBODEN, INC.

BORING NUMBER P-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER P-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

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GEOBODEN, INC.

BORING NUMBER P-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): strong brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE

Lake Elsinore, California

Prepared for:
MR. RON KASSAB

Prepared by:
GEOBODEN INC.
Irvine, CA 92620

December 30, 2017

Project No. Lake Elsinore-1-01

GEOBODEN INC.

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

MR. RON KASSAB

Prepared by:

GEOBODEN INC.
5 Hodgenville, Suite A.
Irvine, California 92620

December 30, 2017

JOB NO. Lake Elsinore-1-01

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017 Project No. Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: Geotechnical Investigation Report
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

GeoBoden, Inc. (GeoBoden) is pleased to submit herewith our geotechnical investigation report for the Proposed Kassab Travel Center to be constructed at 29301 Riverside Drive in the city of Lake Elsinore, California.

This report presents the results of our field investigation, laboratory testing and our engineering judgment, opinions, conclusions and recommendations pertaining to geotechnical design aspects of the proposed development.

It has been a pleasure to be of service to you on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please do not hesitate to contact us.

Respectfully submitted,
GEOBODEN, INC.

Cyrus Radvar,
Principal Engineer, G.E. 2742

Copies: 4/Addressee

GEOTECHNICAL INVESTIGATION REPORT

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

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FIGURES

Figure 1 Vicinity Map
Figure 2 Boring Location Plan

APPENDIXES

Appendix A Boring Logs
Appendix B Laboratory Testing

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
Lake Elsinore, California

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by GeoBoden, Inc. (GeoBoden) for the Proposed Kassab Travel Center to be located at 29301 Riverside Drive in Lake Elsinore, California. The general location of the project is shown on Figure 1.

The purposes of this investigation were to determine the geotechnical properties of subsurface soil conditions, to evaluate their in-place characteristics, evaluate site seismicity, and to provide geotechnical recommendations with respect to site grading and for design and construction of proposed foundations and other site improvements.

The scope of the authorized investigation included performing a site reconnaissance, conducting field exploration and laboratory testing programs, performing engineering analyses, and preparing this Geotechnical Investigation Report. Evaluation of environmental issues or the potential presence of hazardous materials was not within the scope of services provided.

This report has been prepared for RON KASSAB and their other project team members, to be used solely in the development of facilities described herein. This report may not contain sufficient information for other uses or the purposes of other parties.

2.0 SITE LOCATION AND PROJECT DESCRIPTION

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The site is bounded by Collier Avenue on the east, by an existing building on the north, by a vacant land on the west, and by Riverside Drive on the south. The subject property is presently occupied by a vacant land.

The maximum column load for the new building will be about 75 kips, and the line load will be about 3 kips per lineal feet. Currently, it is our understanding that the proposed building will consist of masonry construction with slab on-grade.

3.0 GEOTECHNICAL INVESTIGATION

Our geotechnical investigation included a field exploration program and a laboratory testing programs. These programs were performed in accordance with our scope of services. The field exploration and laboratory testing programs are briefly described below. A more detailed description of the field exploration and laboratory testing programs is provided in Appendix A and Appendix B, respectively.

3.1 FIELD EXPLORATION PROGRAM

The field exploration program was initiated on December 18, 2017 under the supervision of an engineer. Eight (8) exploratory borings were drilled using a truck-mounted drilling rig equipped with 8-inch diameter hollow stem augers. The borings were advanced to depths of ranging from 11.5 to 31.5 feet (below ground surface). The approximate locations of exploratory borings are shown on Figure 2.

Logs of subsurface conditions encountered in the borings were prepared in the field by a representative of our firm. Soil samples consisting of relatively undisturbed brass ring samples and Standard Penetration Tests (SPT) samples were collected at approximately 5-foot depth intervals and were returned to the laboratory for testing. The SPTs were performed in accordance with ASTM D 1586. Final boring logs were prepared from the field logs and are presented in Appendix A.

3.2 LABORATORY TESTING

Selected samples collected during drilling activities were tested in the laboratory to assist in evaluating controlling engineering properties of subsurface materials at the site. Physical tests performed included moisture and density determination, consolidation, expansion index, No. 200 Sieve, Atterberg limits, and corrosion. The results of laboratory are presented in Appendix B.

4.0 DISCUSSION OF FINDINGS

The following discussion of findings for the site is based on the results of the field exploration and laboratory testing programs.

4.1 SITE AND SUBSURFACE CONDITIONS

Observed subsurface native soils consisted of sandy clay, clay, clay with sand, sand and sand with silt to the maximum explored depth of 31.5 feet below ground surface (bgs).

Based on blow counts recorded during sampling, the clayey soils encountered within borings were found to be firm to stiff. The sandy soil was found to be medium dense. For a more detailed description of the subsurface materials refer to the boring logs included in Appendix A of this report.

4.2 GROUNDWATER CONDITIONS

Groundwater was encountered within our exploratory boring B-1 through B-5 at 15 feet bgs. Based on information from the nearby wells (http://www.water.ca.gov/waterdatalibrary/), the historic high ground water level in the site vicinity is at a depth of greater than 50 feet beneath the existing ground surface.

Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

4.3 SOIL ENGINEERING PROPERTIES

Physical tests were performed on the relatively undisturbed samples to characterize the engineering properties of the native soils. Moisture content determination was performed on the samples to evaluate the in-situ moisture content. Moisture content and dry unit weight results are included in Appendix B.

4.4 CONSOLIDATION CHARACTERISTICS

Consolidation tests were performed on samples of the existing fill and native overburden soils recovered from the boring. Results of the consolidation tests indicate that the overburden material will have moderate compressibility under the anticipated loads. These characteristics are compatible with the allowable bearing capacity values and corresponding settlement estimates presented in Foundations Section of our report.

4.5 COLLAPSE POTENTIALS

Results of consolidation tests on samples of native soil indicate that the native soils will have low collapse potential. Removal and recompaction of the surficial soils is expected to reduce the anticipated amount of total differential settlement within the site.

4.6 EXPANSIVE SOILS

Preliminary laboratory testing of representative sample of onsite soils indicate that these materials exhibit LOW expansion potential. We anticipate that the design and performance of the proposed new building will not be affected by expansion of onsite soils.

5.0 STRONG GROUND MOTION POTENTIAL

The project site is located in a seismically active area typical of Southern California and likely to be subjected to a strong ground shaking due to earthquakes on nearby faults.

The Elsinore (Glen Ivy) rev fault is the closest known active fault, located 1.91-km of the site with an anticipated maximum moment magnitude (M_w) of 7.7.

5.1 CBC DESIGN PARAMETERS

To accommodate effects of ground shaking produced by regional seismic events, seismic design can, at the discretion of the designing Structural Engineer, be performed in accordance with the 2016 edition of the California Building Code (CBC). Table below, 2016 CBC Seismic Parameters, lists (next) seismic design parameters based on the 2016 CBC methodology, which is based on ASCE/SEI 7-10:

2016 CBC Seismic Design Parameters	Value
Site Latitude (decimal degrees)	33.6947
Site Longitude (decimal degrees)	-117.3471
Site Class Definition (ASCE 7 Table 20.3-1)	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Figure 1613.3.1(1))	2.293
Mapped Spectral Response Acceleration at 1s Period, S_1 (Figure 1613.3.1(2))	0.915
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613.3.3(1))	1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613.3.3(2))	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16-37)	2.293
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16-38)	1.372
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16-39)	1.528
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16-40)	0.915

6.0 LIQUEFACTION POTENTIAL

For liquefaction to occur, all of three key ingredients are required: liquefaction-susceptible soils, groundwater within a depth of 50 feet or less, and strong earthquake shaking. Soils susceptible to liquefaction are generally saturated loose to medium dense sands and non-plastic silt deposits below the water table.

Groundwater was encountered within our borings B-1 through B-5 at 15 feet. Historic high groundwater at the site is as deep as 50 feet. Soil materials encountered within our borings are clayey soil. It is our opinion that potential for liquefaction at the site is low.

7.0 DESIGN RECOMMENDATIONS

Based upon the results of our investigation, the proposed development is considered geotechnically feasible provided the recommendations presented herein are incorporated into the design and construction. If changes in the design of the structure are made or variations or changed conditions are encountered during construction, GeoBoden should be contacted to evaluate their effects on these recommendations. The following geotechnical engineering recommendations for the proposed buildings are based on observations from the field investigation program and the physical test results.

7.1 EARTHWORK

All earthworks, including excavation, backfill and preparation of subgrade, should be performed in accordance with the geotechnical recommendations presented in this report and applicable portions of the grading code of local regulatory agencies. All earthwork should be performed under the observation and testing of a qualified geotechnical engineer.

7.2 SITE AND FOUNDATION PREPARATION

All site preparation should be observed by experienced personnel reporting to the project Geotechnical Engineer. Our field monitoring services are an essential continuation of our prior studies to confirm and correlate the findings and our prior recommendations with the actual subsurface conditions exposed during construction, and to confirm that suitable fill soils are placed and properly compacted.

Clearing operations should include the removal of all surface vegetation. Large shrubs, when removed, should be grubbed out to include their stumps and major root systems.

In general, all fill soils within the proposed building footprints should be overexcavated and replaced with engineered fill. As a minimum, removals should extend to competent native soils. At least 3 feet of compacted fill should be provided underneath all spread footings and floor slabs. The compacted fill should extend laterally a minimum of 5 feet beyond the foundation footprints, where possible. All existing low-density, near-surface soils will require removal to competent material from areas to receive newly compacted fill. The basis for establishing a competent exposed surface on which to place fill should consist of competent materials exhibiting an in-place relative compaction of at least 85 percent. Prior to placing structural fill, exposed bottom surfaces in each removal area approved for fill should first be scarified to a depth of at least 6 inches, water or air dried as necessary to achieve 3 percent above optimum moisture conditions, and then recompacted in place to a minimum relative compaction of 90 percent.

Based on the observations made in our borings and the results of pertinent laboratory tests, anticipated depths of removal of unsuitable soils will range from 4 to 5 feet. However, actual removal depths will have to be determined during grading on the basis of in-grading observations and testing performed by a representative of geotechnical consultants.

To provide support for foundations for minor structures and for at-grade concrete walks and slabs, all existing fill and disturbed natural soils should be excavated and replaced with properly compacted fill. Any required fill should be properly compacted as specified below.

At least the upper six (6) inches of all excavated surfaces should be scarified and moisture conditioned to 3 percent above optimum moisture, if necessary, and compacted to at least 90 percent relative compaction as per ASTM Standard D1557 test method, prior to placing any fill and/or structures.

7.3 FILL PLACEMENT AND COMPACTION REQUIREMENTS

Material for engineered fill should be select free of organic material, debris, and other deleterious substances, and should not contain fragments greater than 3 inches in maximum dimension. On-site excavated soils that meet these requirements may be used to backfill the excavated building pad area.

All fill should be placed in 6-inch-thick maximum lifts, watered or air dried as necessary to 3 percent above optimum moisture content, and then compacted in place to a maximum relative compaction of 90 percent. The laboratory maximum dry density and optimum moisture content for each change in soil type should be determined in accordance with Test Method ASTM D 1557. A representative of the project consultant should be present on-site during grading operations to verify proper placement and compaction of all fill, as well as to verify compliance with the other geotechnical recommendations presented herein.

Imported soils, if any, should consist of clean materials exhibiting a VERY LOW expansion potential (Expansion Index less than 20). Soils to be imported should be approved by the project geotechnical consultant prior to importation.

7.4 GEOTECHNICAL OBSERVATIONS

Exposed bottom surfaces in each removal area should be observed and approved by the project geotechnical consultant prior to placing fill. No fill should be placed without prior approval from the geotechnical consultant.

The project geotechnical consultant should be present on site during grading operations to verify proper placement and compaction of fill, as well as to verify compliance with the recommendations presented herein.

7.5 UTILITY TRENCH BACKFIL

All utility trench backfill should be compacted to a minimum relative compaction of 90 percent. Trench backfill materials should be placed in lifts no greater than approximately 6 inches in thickness, watered or air-dried as necessary to 3 percent above optimum moisture content, and then mechanically compacted in place to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should probe and test the backfills to verify adequate compaction.

As an alternative for shallow trenches where pipe or utility lines may be damaged by mechanical compaction equipment, such as under floor slabs, imported clean sand exhibiting a sand equivalent (SE) value of 30 or greater may be utilized. The sand backfill materials should be watered to achieve 3 percent above optimum moisture conditions and then tamped into place. No specific relative compaction will be required; however, observation, probing, and if deemed necessary, testing should be performed by a representative of the project geotechnical consultant to verify an adequate degree of compaction and that the backfill will not be subject to settlement.

Where utility trenches enter the footprint of the floor slabs, they should be backfilled through their entire depths with on-site fill materials, sand-cement slurry, or concrete rather than with any sand or gravel shading. This "Plug" of less- or non-permeable materials will mitigate the potential for water to migrate through the backfilled trenches from outside to the areas beneath the foundations and floor slabs.

7.6 SHALLOW FOUNDATIONS

Following the site and foundation preparation recommended above, foundation for load bearing walls and interior columns may be designed as discussed below.

7.6.1 Bearing Capacity and Settlement

Load bearing walls and interior columns may be supported on continuous spread footings and isolated spread footings, respectively, and should bear entirely upon undisturbed native or properly engineered fill. Continuous and isolated footings should have a minimum width of 18 inches and 24 inches, respectively. All footings should be embedded a minimum depth of 24 inches measured from the lowest adjacent finish grade. Continuous and isolated footings placed on such materials may be designed using an allowable (net) bearing capacity of 1,800 pounds per square foot (psf) respectively. Allowable increases of 200 psf for each additional 1 foot in width and 200 psf for each additional 6 inches in depth may be utilized, if desired. The maximum allowable bearing pressure should be 2,500 psf. The maximum bearing value applies to combined dead and sustained live loads. The allowable bearing pressure may be increased by one-third when considering transient live loads, including seismic and wind forces.

Based on the allowable bearing value recommended above, total settlement of the shallow footings are anticipated to be less than one inch, provided foundation preparations conform to the recommendations described in this report. Differential settlement is anticipated to be approximately half the total settlement for similarly loaded footings spaced up to approximately 30 feet apart.

7.6.2 Lateral Load Resistance

Lateral load resistance for the spread footings will be developed by passive soil pressure against sides of footings below grade and by friction acting at the base of the concrete footings bearing on compacted fill. An allowable passive pressure of 200 psf per foot of depth may be used for design purposes. An allowable coefficient of friction 0.30 may be used for dead and sustained live load forces to compute the frictional resistance of the footings constructed directly on compacted fill. Safety factors of 2.0 and 1.5 have been incorporated in development of allowable passive and frictional resistance values, respectively. Under seismic and wind loading conditions, the passive pressure and frictional resistance may be increased by one-third.

7.6.3 Footing Reinforcement

Reinforcement for footings should be designed by the structural engineer based on the anticipated loading conditions. Footings for structures that are supported in low expansive soils should have No. 4 bars, two top and two bottom.

7.7 CONCRETE SLAB ON-GRADE

Concrete slabs will be placed on undisturbed natural soils or properly compacted fill as outlined in Section 7.2. Moisture content of subgrade soils should be maintained 3 percent above the optimum moisture content.

At the time of the concrete pour, subgrade soils should be firm and relatively unyielding. Any disturbed soils should be excavated and then replaced and compacted to a minimum of 90 percent relative compaction. Slabs should be designed to accommodate low expansive fill soils. The structural engineer should determine the minimum slab thickness and reinforcing depending upon the expansive soil condition intended use. Slabs placed on low expansive soils should be at least 4 inches thick and have minimum reinforcement of No. 3 bars placed at mid-height of the slabs and spaced 18 inches on centers, in both directions. The structural engineer may require thicker slabs with more reinforcement depending on the anticipated slab loading conditions.

If moisture-sensitive floor covering is planned, a layer of open-graded gravel, at least 4 inches thick, should be placed below the concrete slab to form a capillary break. Alternately, moisture-proof membrane (such as 10-mil) may be utilized. The vapor barrier should be placed between sand layers (2 inches above and below) to protect the membrane from damage during construction. Gravel for use under a concrete floor slab should be clean, crushed rock that meets the gradation requirements presented below.

Sieve Size	Percentage
1 inch	100
¾ inch	90-100

No. 4 0-10

7.8 PRELIMINARY PAVEMENT DESIGN

Pavement design should be confirmed at the completion of site grading when the subgrade soils are in-place. This should include sampling and R-Value testing of the actual subgrade soils and an analysis based upon the anticipated traffic loading.

For a preliminary pavement design, recommendations for pavement design section of asphalt parking areas are provided below. These values are based on an assumed R-value of 25.

For pavement design, Traffic indexes (TI) of 4.0 and 5.5 were used for the parking areas and auto driveways, respectively. The preliminary flexible pavement layer thickness is as follows:

RECOMMMENDED ASPHALT PAVEMENT SECTION LAYER THICKNESS

Pavement Material	Recommended Thickness	
	TI = 4.0	TI = 5.5
Asphalt Concrete Surface Course	3 inches	4 inches
Class II Aggregate Base Course	6 inches	8 inches
Compacted Subgrade Soils	12 inches	12 inches

Asphalt concrete should conform to Sections 203 and 302 of the latest edition of the Standard Specifications for Public Works Construction ("Greenbook").

Class II aggregate base should conform to Section 26 of the Caltrans Standard Specifications, latest edition. The aggregate base course should be compacted to at least 95 percent of the maximum dry density as determined by ASTM Method D 1557.

Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for three Traffic Indices are presented below. We have assumed that the portland cement concrete will have a compressive strength of at least 3,000 pounds per square inch.

Assumed Traffic Index	PCC Paving (Inches)	Base Course (Inches)
4½ (Automobile Parking)	7	4
5½ (Driveways and Light Track Traffic)	7½	4
6½ (Roadways and Heavy Truck Traffic)	8	4

7.9 SOLUBLE SULFATES AND SOIL CORROSIVITY

Concrete subject to exposure to sulfates shall comply with the requirements set forth in ACI 318, Section 4.3. Based on the available water soluble sulfate results the corrosion potential to buried concrete should be considered "low", i.e., exposure Class S_0, per ACI 318, Table 4.2.1. Consequently, injurious sulfate attack is not a concern with a minimum 28-day compressive strength of 2,500 psi.

Per CBC 2016, Section 1904.4, concrete reinforcement should be protected from corrosion and exposure to chlorides in accordance with ACI 318, Section 4.4.

The corrosion potential of the on-site materials to buried steel was evaluated in accordance with Caltrans corrosive environment evaluation criteria. Caltrans considers a site corrosive, if at least one of the following conditions exists:

- Chloride content ≥ 500 ppm;
- Soluble sulphate content ≥ 2,000 ppm;
- pH ≤ 5.5.

Observations and laboratory tests indicate that based on the Caltrans' criteria the soils at the site are considered non-corrosive. If additional recommendations are desired, it is recommended that a corrosion specialist be consulted regarding suitable types of piping and necessary protection for underground metal conduits.

8.0 CONSTRUCTION CONSIDERATIONS

Based on our field exploration program, earthwork can be performed with conventional construction equipment.

8.1 TEMPORARY DEWATERING

Groundwater was encountered within our borings at 15 feet below ground surface. Based on the anticipated excavation depths, the need for temporary dewatering is considered low.

8.2 CONSTRUCTION SLOPES

Excavations during construction should be conducted so that slope failure and excessive ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsoils, height of the excavation and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall and desiccation.

Where space permits, and providing that adjacent facilities are adequately supported, open excavations may be considered. In general, unsupported slopes for temporary construction excavations should not be expected to stand at an inclination steeper than 1:1 (horizontal:vertical). The temporary excavation side walls may be cut vertically to a height of 3 feet and then laid back at a 1:1 slope ratio above a height of 3 feet.

Surcharge loads should be kept away from the top of temporary excavations a horizontal distance equal to at least one-half the depth of excavation. Surface drainage should be controlled along the top of temporary excavations to preclude wetting of the soils and erosion of the excavation faces. Even with the implementation of the above recommendations, sloughing of the surface of the temporary excavations may still occur, and workmen should be adequately protected from such sloughing.

If site conditions do not provide sufficient space for sloped excavations at the project site, slot cutting techniques in a repeating "ABC" sequence may be required. First, all the slots designated as "A" should be excavated, backfilled and recompacted. The procedure should continue with the "B" slots and end with the "C" slots. The width of each slot should not exceed 6 feet. If any evidence of potential instability is observed, revised recommendations such as narrower slot cuts may be necessary. All slot excavation and backfilling procedures should be performed under the observation and testing of a qualified geotechnical engineer.

9.0 POST INVESTIGATION SERVICES

Final project plans and specifications should be reviewed prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. Following review of plans and specifications, observation should be performed by the geotechnical engineer during construction to document that foundation elements are founded on/or penetrate onto the recommended soils, and that suitable backfill soils are placed upon competent materials and properly compacted at the recommended moisture content.

10.0 CLOSURE

The conclusions, recommendations, and opinions presented herein are: (1) based upon our evaluation and interpretation of the limited data obtained from our field and laboratory programs; (2) based upon an interpolation of soil conditions between and beyond the borings; (3) are subject to confirmation of the actual conditions encountered during construction; and, (4) are based upon the assumption that sufficient observation and testing will be provided during construction.

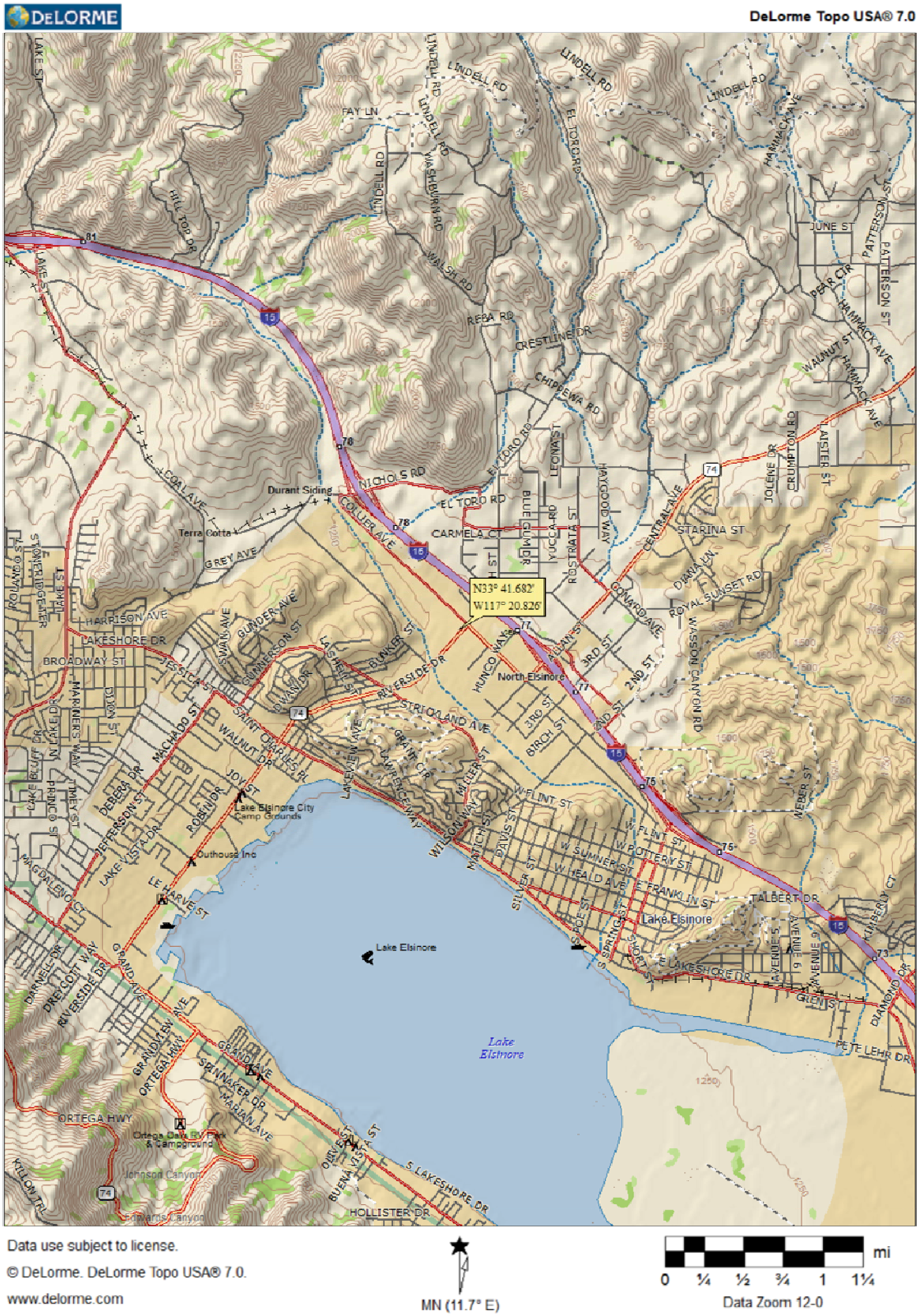
If parties other than GeoBoden are engaged to provide construction geotechnical services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the findings and recommendations in this report or providing alternate recommendations.

If pertinent changes are made in the project plans or conditions are encountered during construction that appear to be different than indicated by this report, please contact this office. Significant variations may necessitate a re-evaluation of the recommendations presented in this report.

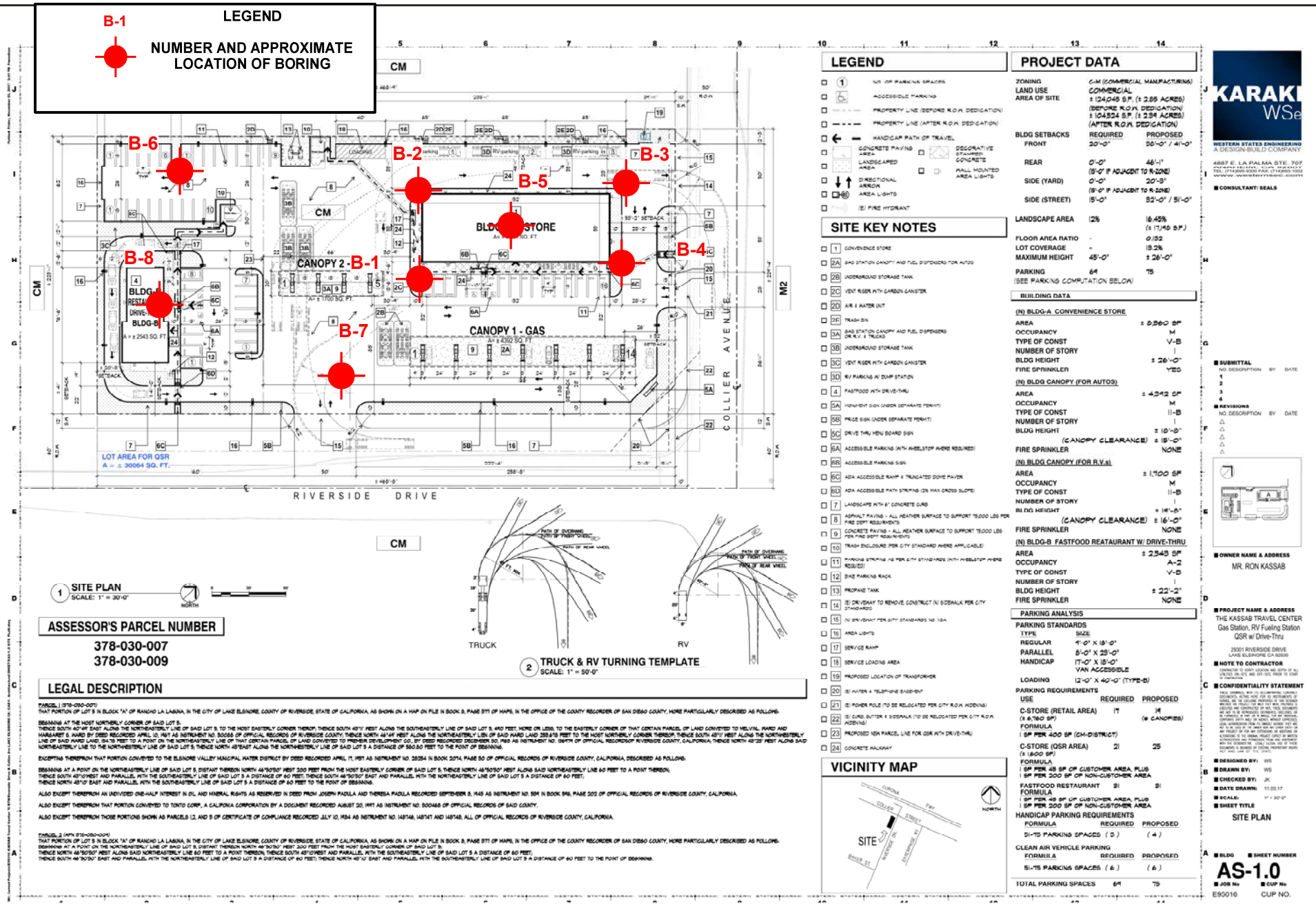
11.0 REFERENCES

California Building Code, 2016 Volume 2.

FIGURES



GEOBODEN INC. Geotechnical Consultants	**SITE VICINITY MAP** **Proposed Kassab Travel Center** **29301 Riverside Drive** **Lake Elsinore, California**	Figure By S.R.	Project No. Lake Elsinore
		Map No. XX	Figure No. 1
		Date 12-30-17	



LEGAL DESCRIPTION

PARCEL 1 (378-030-007)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 5;
THENCE SOUTH 40°48' EAST ALONG THE NORTHEASTERLY LINE OF SAID LOT 5, TO THE MOST EASTERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE SOUTHEASTERLY LINE OF SAID LOT 5, 440 FEET, MORE OR LESS, TO THE EASTERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO MELVIN L. WARD AND MARGARET S. WARD BY DEED RECORDED APRIL 10, 1961 AS INSTRUMENT NO. 50066 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY; THENCE NORTH 46°48' WEST ALONG THE NORTHEASTERLY LINE OF SAID WARD LAND, 259.615 FEET TO THE MOST NORTHERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE NORTHWESTERLY LINE OF SAID WARD LAND, 264.75 FEET TO A POINT ON THE NORTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND CONVEYED TO PREMIER DEVELOPMENT CO., BY DEED RECORDED DECEMBER 30, 1960 AS INSTRUMENT NO. 138478 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA; THENCE NORTH 40°29' WEST ALONG SAID NORTHEASTERLY LINE TO THE NORTHWESTERLY LINE OF SAID LOT 5; THENCE NORTH 49°EAST ALONG THE NORTHWESTERLY LINE OF SAID LOT 5 A DISTANCE OF 560.50 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT BY DEED RECORDED APRIL 17, 1957 AS INSTRUMENT NO. 28294 IN BOOK 2074, PAGE 50 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 46°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5; THENCE NORTH 46°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON;
THENCE SOUTH 43°10'WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE SOUTH 46°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE NORTH 43°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN OIL AND MINERAL RIGHTS AS RESERVED IN DEED FROM JOSEPH PADILLA AND THERESA PADILLA RECORDED SEPTEMBER 8, 1948 AS INSTRUMENT NO. 504 IN BOOK 946, PAGE 202 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO TONTO CORP., A CALIFONIA CORPORATION BY A DOCUMENT RECORDED AUGUST 20, 1991 AS INSTRUMENT NO. 300468 OF OFFICIAL RECORDS OF SAID COUNTY.

ALSO EXCEPT THEREFROM THOSE PORTIONS SHOWN AS PARCELS 1,2, AND 3 OF CERTIFICATE OF COMPLIANCE RECORDED JULY 10, 1984 AS INSTRUMENT NO. 148148, 148147 AND 148149, ALL OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (APN 378-030-004)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 46°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5;
THENCE NORTH 46°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON; THENCE SOUTH 43°10'WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE SOUTH 46°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE NORTH 43°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

GEOBODEN INC. Geotechnical Consultants	BORING LOCATION PLAN Proposed Kassab Travel Center 29301 Riverside Drive Lake Elsinore, California	Figure By S.R.	Project No. Lake Elsinore
		Map No. XX	Figure No. 2
		Date 12-30-17	

APPENDIX A
BORING LOGS

APPENDIX A
SUBSURFACE EXPLORATION PROGRAM

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Prior to drilling, the proposed borings were located in the field by measuring from existing site features.

A total of 8 exploratory borings (B-1 through B-8) were drilled using a hollow-stem auger drill rig equipped with 8-inch outside diameter (O.D.) augers and hand-auger equipment. GeoBoden, Inc. of Irvine, California performed the drilling on December 18, 2017. The borings locations are shown on Figure 2.

Depth-discrete soil samples were collected at selected intervals from the exploratory borings using a 2 ½ -inch inside diameter (I.D.) modified California Split-barrel sampler fitted with 12 brass ring of 2 ½ inches in O.D. and 1-inch in height and one brass liner (2 ½ -inch O.D. by 6 inches long) above the brass rings. The sampler was lowered to the bottom of the boreholes and driven 18 inches into the soil with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the lower 12 inches is shown on the blow count column of the boring logs.

After removing the sampler from the boreholes, the sampler was opened and the brass rings and liner containing the soil were removed and observed for soil classification. Brass rings containing the soil were sealed in plastic canisters to preserve the natural moisture content of the soil. Soil samples collected from exploratory borings were labeled, and were transported for physical testing.

Standard Penetration Tests (SPTs) were also performed. The SPT consists of driving a standard sampler, as described in the ASTM 1586 Standard Method, using a 140-pound hammer falling 30 inches. The number of blows required to drive the SPT sampler the lower 12 inches of the sampling interval is recorded on the blow count column of the boring logs.

The soil classifications and descriptions on field logs were performed using the Unified Soil Classification System as described by the American Society for Testing and Materials (ASTM) D 2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." The final boring logs were prepared from the field logs and are presented in this Appendix.

At the completion of the sampling and logging, the exploratory borings were backfilled with the drilled cuttings.

GEOBODEN, INC.

BORING NUMBER B-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12		97	24	49	18	31	69
10		SANDY CLAY (CL): strong brown, moist, ~30% fine sand, ~70% fines	SS S-2		14			28				70
15		▽ light brown, wet	MC R-3		12							
20			SS S-4		14							
25		brown, wet	SS S-5		12							
30		SAND (SP): yellowish brown, wet, coarse sand	SS S-6		16							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION ___ **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY** ___
AT END OF DRILLING ---
NOTES ___
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, fine sand										
5			MC R-1		16		99	25				
10			SS S-2		11							
15		SANDY CLAY (CL): yellowish brown, moist, ~30% fine sand, ~70% fines ▽	MC R-3		12							
20		SAND (SP): light yellowish brown, wet, coarse sand	SS S-4		15							
25		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines	SS S-5		21							
30			SS S-6		26							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		13		100	26				
10			SS S-2		16							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
15		▽	MC R-3		19							
20			SS S-4		14							
25		wet	SS S-5		12							
		SAND w. SILT (SP-SM): yellowish brown, wet										
30			SS S-6		16							
		Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-4

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		CLAY (CL): grayish brown, moist										
5			MC R-1		19		103	27				
		CLAY w. SAND (CL): yellowish brown, moist, ~20% fine sand, ~80% fines [NATIVE]										
10			SS S-2		26							
15		▽	MC R-3		36							
20			SS S-4		29							
		Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-5

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		14		104	27				
10		CLAY (CL): brown, moist, ~10% fine sand, ~90% fines	SS S-2		11							
15	▽		MC R-3		14							
20			SS S-4		18							

Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-6

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		11		103	26				
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		14							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-7

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		16							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-8

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		16							
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		18							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

APPENDIX B
LABORATORY TESTING

APPENDIX B
LABORATORY TESTING
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Laboratory tests were performed on selected samples to assess the engineering properties and physical characteristics of soils at the site. The following tests were performed:

- moisture content and dry density
- No. 200 Wash sieve
- Atterberg limits
- consolidation
- expansion potential
- corrosion

Test results are summarized on laboratory data sheets or presented in tabular form in this appendix.

Moisture Density Tests

The field moisture contents, as a percentage of the dry weight of the soils, were determined by weighing samples before and after oven drying. The dry density, in pounds per cubic foot, was also determined fir all relatively undisturbed ring samples collected. These analyses were performed in accordance with ASTM D 2937. The results of these determinations are shown on the boring logs in Appendix A.

No. 200 Wash Sieve

A quantitative determination of the percentage of soil finer than 0.075 mm was performed on a selected soil sample by washing the soil through the No. 200 sieve. Test procedures were performed in accordance with ASTM Method D1140. The results of the tests are shown on the boring logs.

Atterberg Limits

Liquid limit, plastic limit, and plasticity index were determined for selected soil sample in accordance with ASTM D 4318. The soil sample was air-dried and passed through a No. 40 sieve and moisturized. The liquid and plastic limit tests were performed on the fraction passing the No. 40 sieve. Results of the Atterberg limits tests are shown graphically and presented in this Appendix.

Consolidation

The test was performed in accordance with ASTM Test method D 2345. The compression curve from the consolidation test is presented in this Appendix.

Expansion Potential

Expansion index test was performed on a representative sample of the on-site soils in accordance with ASTM D4829. The result of the expansion test is summarized in Table B-1.

TABLE B-1 (Expansion Index Test Data)

Boring Designation	**Depth (ft)**	Expansion Index (EI)
B-1	0-5	22

Corrosion Potential

A selected soil sample was tested to determine the corrosivity of the site soil to steel and concrete. The soil sample was tested for soluble sulfate (Caltrans 417), soluble chloride (Caltrans 422), and pH and minimum resistivity (Caltrans 643). The results of corrosion tests are summarized in Table B-2.

TABLE B-2 (Corrosion Test Results)

Boring No.	**Depth (ft)**	**Chloride Content (Calif. 422) ppm**	**Sulfate Content (Calif. 417) % by Weight**	**pH (Calif. 643)**	**Resistivity (Calif. 643) Ohm*cm**
B-1	0-5	89	0.0178	7.6	1,058

GEOBODEN, INC.

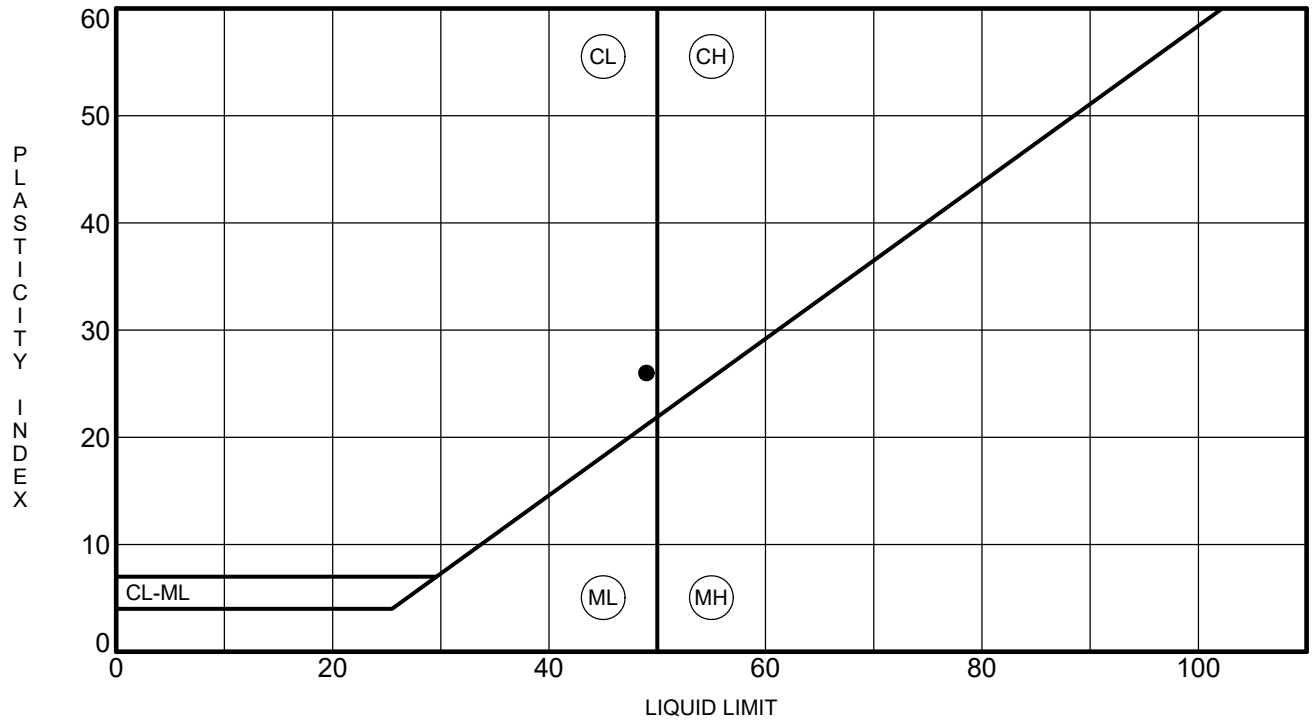
ATTERBERG LIMITS' RESULTS

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**B-1**	**5.0**	**49**	**23**	**26**	**69**	**SANDY LEAN CLAY(CL)**

ATTERBERG LIMITS - GINT STD US LAB.GDT - 12/30/17 11:40 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

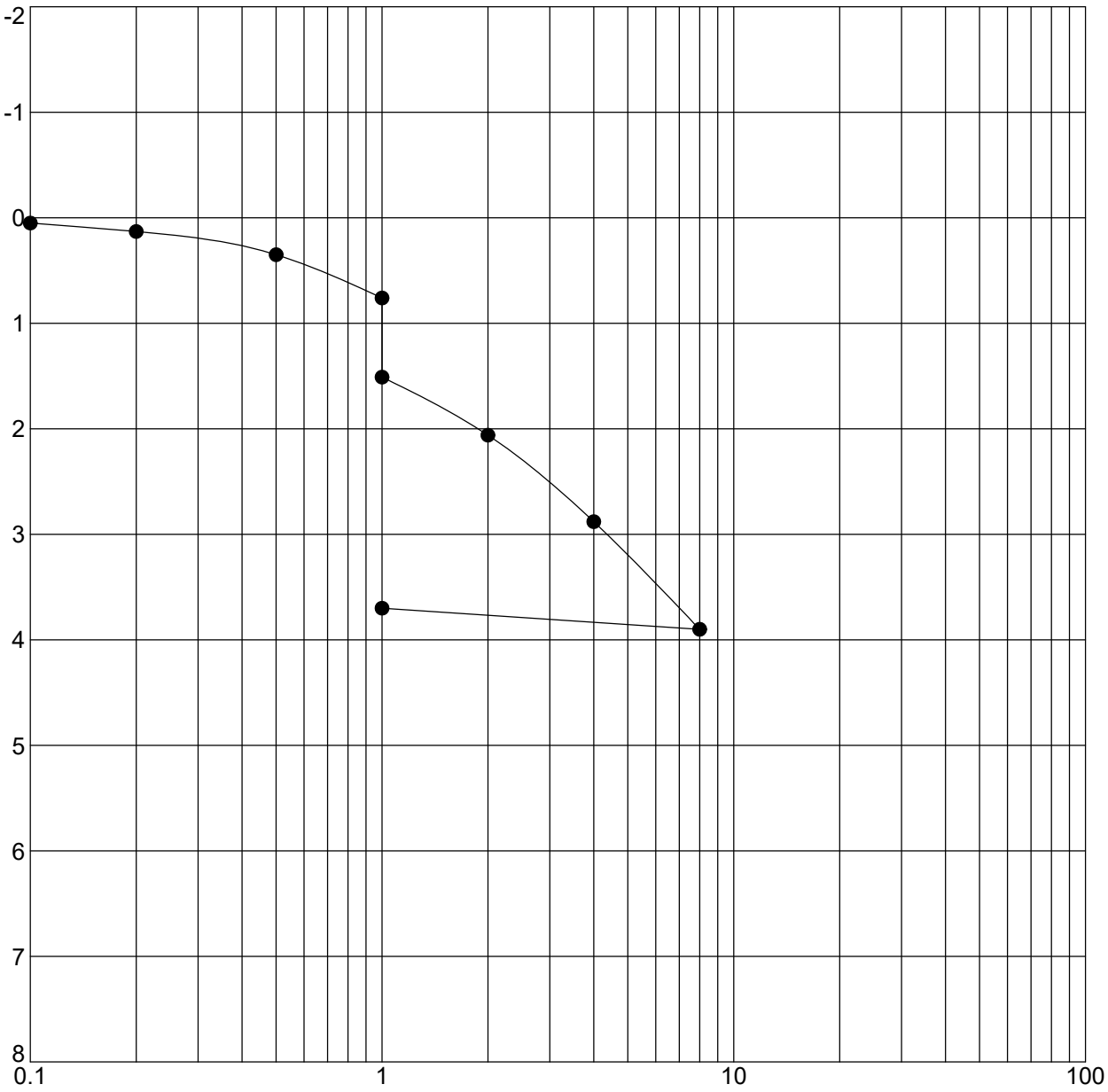
CONSOLIDATION TEST

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



Specimen Identification		Classification	γ_d	MC%
● B-1 5.0		**SANDY LEAN CLAY(CL)**	**97**	**24**

CONSOL STRAIN - GINT STD US LAB.GDT - 12/30/17 11:41 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

Appendix 4: Historical Site Conditions

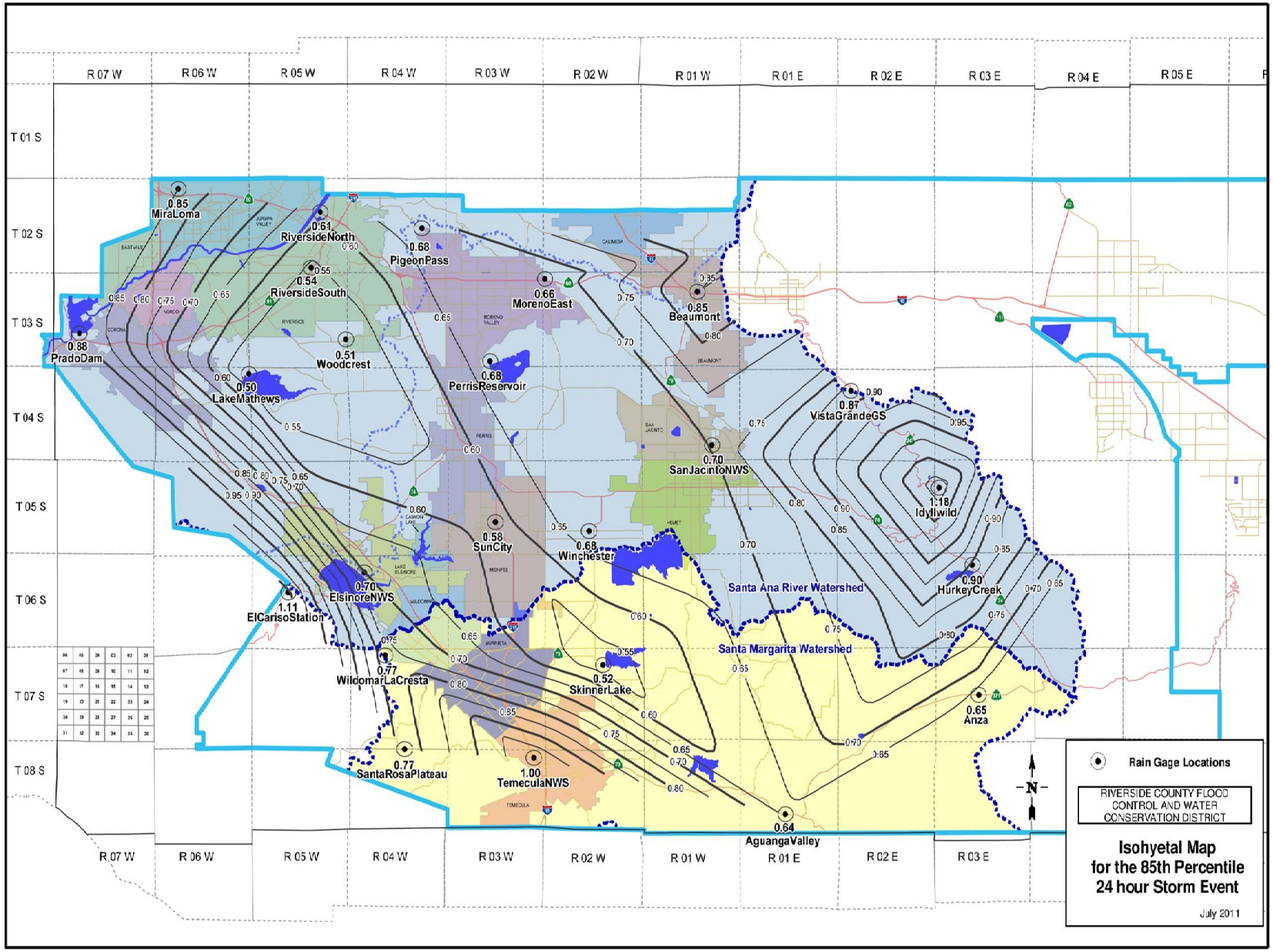
Phase I Environmental Site Assessment or Other Information on Past Site Use

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation


R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
0.85 MiraLoma
0.61 RiverSideNorth
0.68 PigeonPass
0.54 RiverSideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.68 PerrisReservoir
0.50 LakeMathews
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
Santa Ana River Watershed
Santa Margarita Watershed
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
N
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*27,456*	*Mixed Surface Types*	*0.86*	*0.67*	*18518.7*			
	27456		*Total*		18518.7	0.70	*1080.3*	*1,140*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 11/30/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-2/ BIOFILTRATION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA B	*26,397*	*Mixed Surface Types*	*0.96*	*0.82*	*21732.5*			
	26397	*Total*			*21732.5*	*0.70*	*1267.7*	*1,500*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 11/26/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-4/ BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA-D	*5,536*	*Concrete or Asphalt*	*1*	*0.89*	*4938.1*			
	5536		***Total***		**4938.1**	**0.70**	***288.1***	***312***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-5/ LANDSCAPE AREAS

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-E	*3,583*	*Mixed Surface Types*	*0.42*	*0.29*	*1042.9*			
	3583		*Total*		1042.9	0.70	*60.8*	*186*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-6/ LANDSCAPE AREAS

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-F	*4,697*	*Mixed Surface Types*	*0.64*	*0.44*	*2070.4*			
	4697		*Total*		*2070.4*	*0.70*	*120.8*	*121*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-7/BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-G	*5,612*	*Mixed Surface Types*	*0.62*	*0.42*	*2382.5*			
	5612		***Total***		**2382.5**	**0.70**	***139***	***176***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-8/LANDSCAPE AREA/BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-H	*29,939*	*Mixed Surface Types*	*0.95*	*0.81*	*24160.1*			
	29939		*Total*		*24160.1*	*0.70*	*1409.3*	*1,410*

Notes:

Bioretention Facility - Design Procedure	BMP ID 1	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 4/25/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.63 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 1,080 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 30.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.33 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 815 ft^2

Proposed Surface Area A= 857 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Trees

Notes:

Bioretention Facility - Design Procedure	BMP ID 4	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 11/26/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.13 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 288 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 234 ft^2

Proposed Surface Area A= 254 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Shrubs

Notes:

Bioretention Facility - Design Procedure	BMP ID 5	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 4/25/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.08 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 61 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 30.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.33 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 46 ft^2

Proposed Surface Area A= 140 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Trees

Notes:

Bioretention Facility - Design Procedure	BMP ID 7	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 11/26/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.13 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 139 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 113 ft^2

Proposed Surface Area A= 143 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Shrubs

Notes:

Bioretention Facility - Design Procedure	BMP ID 8	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 4/25/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.69 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 1,409 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 30.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.33 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 1,063 ft^2

Proposed Surface Area A= 1,172 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Trees

Notes:

Appendix 7:Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

HCOC MITIGATION

Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

THIS CONDITION WAS MET BY SIZING THE OUTLET PIPE COMING OUT OF THE SITE TO CARRY A RUNOFF DISCHARGE OF NOT MORE THAN 10% OF THE 2 YR PRE DEVELOPESD HYDROGRAPH. THE RUNOFF DISCHARGE WAS CALCULATED USING THE MANNING'S FORMULA:

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

USING A 4" DIAMETER PIPE @ THE OUTLET;

$$A = (3.14)(0.33)^2/4$$

$$= 0.085 \text{ SF}$$

$$R^{2/3} = [(0.085/1.0362)]^{2/3}$$

$$= 0.187$$

$$S = .01$$

$$Q = (1.146)(0.085)(0.187)(0.1)$$

$$= 0.18 \text{ CFS} < \text{EXIST. PRE DISCHARGE @ 2 YR PEAK}$$

DMA	PRE DISCHARGE 2 YR-24 HR (CFS)	POST DISCHARGE 2 YR-24 HR (CFS)	REMARKS
A	0.30 CFS	0.18 CFS	@ OUTLET
B	0.29 CFS	0.18 CFS	@ OUTLET
H	0.26 CFS	0.18 CFS	@ OUTLET

IN CVASE OF HIGH WATER FLOWS, RUNOFF WILL FLOW INTO AN OVERFLOW GRATE INLET STRUTURE TOWARDS TO UNDERGROUND RETENTION CHAMBERS. IN AN OVERFLOW 4" PIPE WILL BE INSTALLED TO SERVE AS AN OVERFLOW DEVICE IN THE EVENT WATER RISES UP INSIDE THE CHAMBERS. THE OVERFLOW PIPE WAS SIZED TO CARRY A DISCHARGE LESS THAN THE DISCHARGE RATE ON THE PRE-DEVELOPED CONDITION.

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Kassab Travel Center
Pre-Developed

SUB-AREA:
DMA A Outlet .00098 69. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

Kassab Travel Center
Pre-Developed

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STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA A	0.980E-03		0.128		12.02	0.30	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.842	0.05	0.06	0.07	0.09	0.10	0.11	0.13
11.886	0.14	0.16	0.17	0.19	0.20	0.22	0.23
11.930	0.24	0.25	0.26	0.26	0.27	0.27	0.28
11.975	0.28	0.28	0.28	0.29	0.29	0.29	0.30
12.019	0.30	0.30	0.29	0.28	0.27	0.25	0.24
12.063	0.22	0.20	0.18	0.17	0.15	0.14	0.13
12.107	0.12	0.11	0.11	0.10	0.10	0.09	0.09
12.151	0.09	0.08	0.08	0.08	0.08	0.08	0.07
12.196	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.240	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.284	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.328	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.372	0.06	0.06	0.06	0.05	0.05	0.05	0.05
12.417	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Area or Drainage Rain Gage Runoff Peak Flow

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TR20.inp

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
Pre-Developed

STORM 2-Yr

SUB-AREA:
DMA A Outlet .00098 69. .1

STREAM REACH:

Reach Identifier	Area (sq mi)	ID or Location	Amount (in)	Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.980E-03		0.128		12.02	0.30	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.842	0.05	0.06	0.07	0.09	0.10	0.11	0.13
11.886	0.14	0.16	0.17	0.19	0.20	0.22	0.23
11.930	0.24	0.25	0.26	0.26	0.27	0.27	0.28
11.975	0.28	0.28	0.28	0.29	0.29	0.29	0.30
12.019	0.30	0.30	0.29	0.28	0.27	0.25	0.24
12.063	0.22	0.20	0.18	0.17	0.15	0.14	0.13
12.107	0.12	0.11	0.11	0.10	0.10	0.09	0.09
12.151	0.09	0.08	0.08	0.08	0.08	0.08	0.07
12.196	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.240	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.284	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.328	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.372	0.06	0.06	0.06	0.05	0.05	0.05	0.05
12.417	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Kassab Travel Center
Pre-Developed

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)				
DMA A	0.980E-03		0.30				
OUTLET	0.980E-03		0.30				

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
Pre-Developed

STORM 2-Yr

SUB-AREA:

	DMA A	Outlet	.00098	69.	.1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
Pre-Developed

STORM 2-Yr

SUB-AREA:

	DMA A	Outlet	.00098	69.	.1

STREAM REACH:

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WinTR-20 Printed Page File      Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10                  0         0         0.05
Kassab Travel Center
2yr Post-Developed

SUB-AREA:
          DMA A     Outlet              .00098    92.       .1

STREAM REACH:

STORM ANALYSIS:
          2-Yr                          2.39      Type II   2

STRUCTURE RATING:


GLOBAL OUTPUT:
          2         0.05                YYYYN     YYYYNN



WinTR-20 Printed Page File      End of Input Data List
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Kassab Travel Center
2yr Post-Developed

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA A	0.980E-03		1.096		11.93	1.52	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.932	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.976	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.020	0.05	0.05	0.05	0.06	0.06	0.06	0.06
11.065	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.109	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.153	0.06	0.06	0.07	0.07	0.07	0.07	0.07
11.197	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.241	0.07	0.07	0.07	0.07	0.07	0.08	0.08
11.286	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.330	0.08	0.08	0.08	0.08	0.08	0.08	0.09
11.374	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.462	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.507	0.10	0.10	0.10	0.11	0.11	0.12	0.12
11.551	0.13	0.14	0.15	0.16	0.17	0.18	0.18
11.595	0.19	0.19	0.20	0.20	0.21	0.22	0.23
11.639	0.25	0.26	0.28	0.30	0.32	0.34	0.36
11.683	0.37	0.39	0.40	0.41	0.42	0.44	0.45
11.728	0.46	0.48	0.50	0.53	0.56	0.58	0.61
11.772	0.64	0.66	0.69	0.71	0.73	0.74	0.76
11.816	0.78	0.81	0.84	0.88	0.93	0.98	1.04
11.860	1.10	1.16	1.22	1.28	1.33	1.37	1.42
11.905	1.45	1.48	1.50	1.51	1.52	1.52	1.50
11.949	1.48	1.46	1.43	1.41	1.38	1.36	1.33
11.993	1.31	1.30	1.28	1.27	1.24	1.22	1.18
12.037	1.13	1.06	0.99	0.92	0.84	0.77	0.70
12.081	0.63	0.57	0.52	0.48	0.44	0.41	0.39
12.126	0.37	0.35	0.33	0.31	0.30	0.29	0.28
12.170	0.27	0.26	0.25	0.25	0.24	0.24	0.24
12.214	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.258	0.21	0.21	0.21	0.20	0.20	0.20	0.20
12.302	0.20	0.19	0.19	0.19	0.19	0.19	0.19
12.347	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.391	0.17	0.17	0.17	0.16	0.16	0.16	0.16
12.435	0.16	0.16	0.15	0.15	0.15	0.15	0.14

12.479	0.14	0.14	0.14	0.14	0.14	0.14	0.13
12.523	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.568	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.612	0.12	0.11	0.11	0.11	0.11	0.11	0.11
12.656	0.11	0.11	0.11	0.11	0.11	0.11	0.11

Kassab Travel Center
2yr Post-Developed

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
12.700	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.745	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.789	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.833	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.877	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.921	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.966	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.010	0.09	0.09	0.09	0.09	0.08	0.08	0.08
13.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.231	0.08	0.08	0.08	0.08	0.07	0.07	0.07
13.275	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.319	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.540	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.585	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.629	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.673	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.717	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.761	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.806	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.850	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.894	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.938	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.982	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.027	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.071	0.05	0.05	0.05	0.05	0.05		

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.980E-03		1.096		11.93	1.52	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.932	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.976	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.020	0.05	0.05	0.05	0.06	0.06	0.06	0.06
11.065	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.109	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.153	0.06	0.06	0.07	0.07	0.07	0.07	0.07
11.197	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.241	0.07	0.07	0.07	0.07	0.07	0.08	0.08

Kassab Travel Center
2yr Post-Developed

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.286	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.330	0.08	0.08	0.08	0.08	0.08	0.08	0.09
11.374	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
2yr Post-Developed

STORM 2-Yr

SUB-AREA:
DMA A Outlet .00098 92. .1

STREAM REACH:

11.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.462	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.507	0.10	0.10	0.10	0.11	0.11	0.12	0.12
11.551	0.13	0.14	0.15	0.16	0.17	0.18	0.18
11.595	0.19	0.19	0.20	0.20	0.21	0.22	0.23
11.639	0.25	0.26	0.28	0.30	0.32	0.34	0.36
11.683	0.37	0.39	0.40	0.41	0.42	0.44	0.45
11.728	0.46	0.48	0.50	0.53	0.56	0.58	0.61
11.772	0.64	0.66	0.69	0.71	0.73	0.74	0.76
11.816	0.78	0.81	0.84	0.88	0.93	0.98	1.04
11.860	1.10	1.16	1.22	1.28	1.33	1.37	1.42
11.905	1.45	1.48	1.50	1.51	1.52	1.52	1.50
11.949	1.48	1.46	1.43	1.41	1.38	1.36	1.33
11.993	1.31	1.30	1.28	1.27	1.24	1.22	1.18
12.037	1.13	1.06	0.99	0.92	0.84	0.77	0.70
12.081	0.63	0.57	0.52	0.48	0.44	0.41	0.39
12.126	0.37	0.35	0.33	0.31	0.30	0.29	0.28
12.170	0.27	0.26	0.25	0.25	0.24	0.24	0.24
12.214	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.258	0.21	0.21	0.21	0.20	0.20	0.20	0.20
12.302	0.20	0.19	0.19	0.19	0.19	0.19	0.19
12.347	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.391	0.17	0.17	0.17	0.16	0.16	0.16	0.16
12.435	0.16	0.16	0.15	0.15	0.15	0.15	0.14
12.479	0.14	0.14	0.14	0.14	0.14	0.14	0.13
12.523	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.568	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.612	0.12	0.11	0.11	0.11	0.11	0.11	0.11
12.656	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.700	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.745	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.789	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.833	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.877	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.921	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.966	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.010	0.09	0.09	0.09	0.09	0.08	0.08	0.08
13.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.231	0.08	0.08	0.08	0.08	0.07	0.07	0.07
13.275	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.319	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
13.540	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.585	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
2yr Post-Developed

STORM 2-Yr

SUB-AREA:
DMA A Outlet .00098 92. .1

STREAM REACH:

13.629	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.673	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.717	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.761	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.806	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.850	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.894	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.938	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.982	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.027	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.071	0.05	0.05	0.05	0.05	0.05		

Kassab Travel Center
2yr Post-Developed

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA A	0.980E-03		1.52				

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WinTR-20: Version 1.10                  0         0         0.05
b Travel Center                                                          (continued)
2yr Post-Developed
                                           STORM 2-Yr
SUB-AREA:
          DMA A     Outlet              .00098    92.       .1

STREAM REACH:
OUTLET    0.980E-03                1.52
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WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
KASSAB TRAVEL CENTER
PRE DEVELOPED

SUB-AREA:
DMA B Outlet .00095 69. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

KASSAB TRAVEL CENTER
PRE DEVELOPED

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA B	0.950E-03		0.126		12.02	0.29	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.848	0.06	0.07	0.08	0.10	0.11	0.12	0.14
11.892	0.15	0.17	0.18	0.20	0.21	0.22	0.23
11.937	0.24	0.25	0.26	0.26	0.26	0.27	0.27
11.981	0.27	0.28	0.28	0.28	0.29	0.29	0.29
12.025	0.29	0.28	0.27	0.26	0.25	0.23	0.21
12.069	0.19	0.18	0.16	0.15	0.14	0.13	0.12
12.114	0.11	0.10	0.10	0.09	0.09	0.09	0.08
12.158	0.08	0.08	0.08	0.08	0.07	0.07	0.07
12.202	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.246	0.07	0.06	0.06	0.06	0.06	0.06	0.06
12.290	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.335	0.06	0.06	0.06	0.06	0.06	0.06	0.05
12.379	0.05	0.05	0.05	0.05	0.05	0.05	0.05
12.423	0.05	0.05	0.05				

Area or	Drainage	Rain Gage	Runoff	Peak Flow

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA B	Outlet	.00095	69.	.1	

STREAM REACH:

Reach Identifier	Area (sq mi)	ID or Location	Amount (in)	Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.950E-03		0.126		12.02	0.29	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.848	0.06	0.07	0.08	0.10	0.11	0.12	0.14
11.892	0.15	0.17	0.18	0.20	0.21	0.22	0.23
11.937	0.24	0.25	0.26	0.26	0.26	0.27	0.27
11.981	0.27	0.28	0.28	0.28	0.29	0.29	0.29
12.025	0.29	0.28	0.27	0.26	0.25	0.23	0.21
12.069	0.19	0.18	0.16	0.15	0.14	0.13	0.12
12.114	0.11	0.10	0.10	0.09	0.09	0.09	0.08
12.158	0.08	0.08	0.08	0.08	0.07	0.07	0.07
12.202	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.246	0.07	0.06	0.06	0.06	0.06	0.06	0.06
12.290	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.335	0.06	0.06	0.06	0.06	0.06	0.06	0.05
12.379	0.05	0.05	0.05	0.05	0.05	0.05	0.05
12.423	0.05	0.05	0.05				

KASSAB TRAVEL CENTER
PRE DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)				
DMA B	0.950E-03		0.29				
OUTLET	0.950E-03		0.29				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 69. .1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 69. .1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
KASSAB TRAVEL CENTER
POST DEVELOPED

SUB-AREA:
DMA B Outlet .00095 92. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

KASSAB TRAVEL CENTER
POST DEVELOPED

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA B	0.950E-03		1.088		11.93	1.47	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.963	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.008	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.052	0.05	0.05	0.06	0.06	0.06	0.06	0.06
11.096	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.140	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.185	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.229	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.273	0.07	0.07	0.07	0.08	0.08	0.08	0.08
11.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.361	0.08	0.08	0.08	0.08	0.08	0.09	0.09
11.406	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.450	0.09	0.09	0.09	0.09	0.09	0.09	0.10
11.494	0.10	0.10	0.10	0.10	0.10	0.10	0.11
11.538	0.11	0.12	0.13	0.14	0.15	0.15	0.16
11.582	0.17	0.18	0.18	0.19	0.19	0.20	0.21
11.627	0.21	0.23	0.24	0.26	0.27	0.29	0.31
11.671	0.33	0.35	0.36	0.38	0.39	0.40	0.41
11.715	0.42	0.44	0.45	0.47	0.49	0.51	0.54
11.759	0.57	0.59	0.62	0.64	0.67	0.69	0.71
11.803	0.72	0.74	0.76	0.78	0.81	0.85	0.90
11.848	0.95	1.01	1.07	1.13	1.18	1.24	1.29
11.892	1.33	1.37	1.41	1.43	1.45	1.47	1.47
11.936	1.47	1.46	1.44	1.42	1.39	1.36	1.34
11.980	1.31	1.29	1.27	1.26	1.24	1.23	1.21
12.025	1.18	1.14	1.09	1.03	0.96	0.89	0.82
12.069	0.74	0.68	0.61	0.56	0.51	0.46	0.43
12.113	0.40	0.38	0.35	0.34	0.32	0.30	0.29
12.157	0.28	0.27	0.26	0.25	0.25	0.24	0.24
12.201	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.246	0.21	0.21	0.21	0.20	0.20	0.20	0.19
12.290	0.19	0.19	0.19	0.19	0.19	0.19	0.18
12.334	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.378	0.17	0.17	0.16	0.16	0.16	0.16	0.16
12.422	0.16	0.16	0.15	0.15	0.15	0.15	0.15
12.467	0.14	0.14	0.14	0.14	0.13	0.13	0.13

12.511	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.555	0.12	0.12	0.12	0.12	0.12	0.11	0.11
12.599	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.643	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.688	0.10	0.10	0.10	0.10	0.10	0.10	0.10

KASSAB TRAVEL CENTER
POST DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
12.732	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.776	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.820	0.10	0.10	0.10	0.09	0.09	0.09	0.09
12.865	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.909	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.953	0.09	0.09	0.09	0.09	0.09	0.08	0.08
12.997	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.041	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.086	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.130	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.174	0.08	0.08	0.07	0.07	0.07	0.07	0.07
13.218	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.262	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.307	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.351	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.395	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.439	0.07	0.07	0.07	0.07	0.07	0.06	0.06
13.483	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.528	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.572	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.616	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.660	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.705	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.749	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.793	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.837	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.881	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.926	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.970	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.014	0.05	0.05					

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.950E-03		1.088		11.93	1.47	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.963	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.008	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.052	0.05	0.05	0.06	0.06	0.06	0.06	0.06
11.096	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.140	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.185	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.229	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.273	0.07	0.07	0.07	0.08	0.08	0.08	0.08
11.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.361	0.08	0.08	0.08	0.08	0.08	0.09	0.09

KASSAB TRAVEL CENTER
POST DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.406	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.450	0.09	0.09	0.09	0.09	0.09	0.09	0.10
11.494	0.10	0.10	0.10	0.10	0.10	0.10	0.11

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
POST DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 92. .1

STREAM REACH:

11.538	0.11	0.12	0.13	0.14	0.15	0.15	0.16
11.582	0.17	0.18	0.18	0.19	0.19	0.20	0.21
11.627	0.21	0.23	0.24	0.26	0.27	0.29	0.31
11.671	0.33	0.35	0.36	0.38	0.39	0.40	0.41
11.715	0.42	0.44	0.45	0.47	0.49	0.51	0.54
11.759	0.57	0.59	0.62	0.64	0.67	0.69	0.71
11.803	0.72	0.74	0.76	0.78	0.81	0.85	0.90
11.848	0.95	1.01	1.07	1.13	1.18	1.24	1.29
11.892	1.33	1.37	1.41	1.43	1.45	1.47	1.47
11.936	1.47	1.46	1.44	1.42	1.39	1.36	1.34
11.980	1.31	1.29	1.27	1.26	1.24	1.23	1.21
12.025	1.18	1.14	1.09	1.03	0.96	0.89	0.82
12.069	0.74	0.68	0.61	0.56	0.51	0.46	0.43
12.113	0.40	0.38	0.35	0.34	0.32	0.30	0.29
12.157	0.28	0.27	0.26	0.25	0.25	0.24	0.24
12.201	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.246	0.21	0.21	0.21	0.20	0.20	0.20	0.19
12.290	0.19	0.19	0.19	0.19	0.19	0.19	0.18
12.334	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.378	0.17	0.17	0.16	0.16	0.16	0.16	0.16
12.422	0.16	0.16	0.15	0.15	0.15	0.15	0.15
12.467	0.14	0.14	0.14	0.14	0.13	0.13	0.13
12.511	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.555	0.12	0.12	0.12	0.12	0.12	0.11	0.11
12.599	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.643	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.688	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.732	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.776	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.820	0.10	0.10	0.10	0.09	0.09	0.09	0.09
12.865	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.909	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.953	0.09	0.09	0.09	0.09	0.09	0.08	0.08
12.997	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.041	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.086	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.130	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.174	0.08	0.08	0.07	0.07	0.07	0.07	0.07
13.218	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.262	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.307	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.351	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.395	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.439	0.07	0.07	0.07	0.07	0.07	0.06	0.06
13.483	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.528	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.572	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.616	0.06	0.06	0.06	0.06	0.06	0.06	0.06

Line Start Time (hr) — Flow Values @ time increment of 0.006 hr (cfs)

13.660	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.705	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
POST DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 92. .1

STREAM REACH:

13.749	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.793	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.837	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.881	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.926	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.970	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.014	0.05	0.05					

KASSAB TRAVEL CENTER
POST DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA B	0.950E-03		1.47				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

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WinTR-20: Version 1.10                  0         0         0.05
B TRAVEL CENTER                                                                (continued)
POST DEVELOPED
                                           STORM 2-Yr
SUB-AREA:
          DMA B     Outlet              .00095    92.       .1

STREAM REACH:
OUTLET    0.950E-03                 1.47
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WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
KASSAB TRAVEL CTR
PRE DEVELOPED

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

KASSAB TRAVEL CTR
PRE DEVELOPED

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA G	0.002		0.173		12.02	0.55	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.829	0.06	0.08	0.09	0.11	0.13	0.16	0.18
11.874	0.21	0.24	0.26	0.29	0.32	0.35	0.38
11.918	0.40	0.43	0.45	0.46	0.48	0.49	0.50
11.962	0.50	0.51	0.51	0.52	0.52	0.53	0.54
12.006	0.54	0.55	0.55	0.55	0.54	0.52	0.50
12.050	0.47	0.44	0.40	0.37	0.34	0.31	0.28
12.095	0.26	0.24	0.22	0.21	0.20	0.19	0.18
12.139	0.17	0.17	0.16	0.16	0.15	0.15	0.14
12.183	0.14	0.14	0.14	0.13	0.13	0.13	0.13
12.227	0.13	0.13	0.13	0.12	0.12	0.12	0.12
12.271	0.12	0.12	0.12	0.12	0.11	0.11	0.11
12.316	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.360	0.11	0.11	0.10	0.10	0.10	0.10	0.10
12.404	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.448	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.492	0.09	0.08	0.08	0.08	0.08	0.08	0.08
12.537	0.08	0.08	0.08	0.08	0.08	0.08	0.08
12.581	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.625	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.669	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.714	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.758	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.802	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.846	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.890	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.935	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.979	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.023	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.111	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.156	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.200	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.244	0.05	0.05	0.05	0.05	0.05	0.05	

Area or	Drainage	Rain Gage	Runoff	Peak Flow

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

Reach Identifier	Area (sq mi)	ID or Location	Amount (in)	Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.002		0.173		12.02	0.55	304.11

KASSAB TRAVEL CTR
PRE DEVELOPED

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:
Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.829	0.06	0.08	0.09	0.11	0.13	0.16	0.18
11.874	0.21	0.24	0.26	0.29	0.32	0.35	0.38
11.918	0.40	0.43	0.45	0.46	0.48	0.49	0.50
11.962	0.50	0.51	0.51	0.52	0.52	0.53	0.54
12.006	0.54	0.55	0.55	0.55	0.54	0.52	0.50
12.050	0.47	0.44	0.40	0.37	0.34	0.31	0.28
12.095	0.26	0.24	0.22	0.21	0.20	0.19	0.18

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

12.139	0.17	0.17	0.16	0.16	0.15	0.15	0.14
12.183	0.14	0.14	0.14	0.13	0.13	0.13	0.13
12.227	0.13	0.13	0.13	0.12	0.12	0.12	0.12
12.271	0.12	0.12	0.12	0.12	0.11	0.11	0.11
12.316	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.360	0.11	0.11	0.10	0.10	0.10	0.10	0.10
12.404	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.448	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.492	0.09	0.08	0.08	0.08	0.08	0.08	0.08
12.537	0.08	0.08	0.08	0.08	0.08	0.08	0.08
12.581	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

12.625	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.669	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.714	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.758	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.802	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.846	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.890	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.935	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.979	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.023	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05

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WinTR-20: Version 1.10                  0         0         0.05
B TRAVEL CTR                                                                (continued)
PRE DEVELOPED
                                          STORM 2-Yr
SUB-AREA:
          DMA G     Outlet              .00181    69.       .1

STREAM REACH:
    13.111      0.05      0.05      0.05      0.05      0.05      0.05      0.05
    13.156      0.05      0.05      0.05      0.05      0.05      0.05      0.05
    13.200      0.05      0.05      0.05      0.05      0.05      0.05      0.05
    13.244      0.05      0.05      0.05      0.05      0.05      0.05
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WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA G	Outlet	.00181	69.	.1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

KASSAB TRAVEL CTR
PRE DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA G	0.002		0.55				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:
OUTLET 0.002 0.55

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA G	Outlet	.00181	69.	.1

STREAM REACH:

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA G	Outlet	.00181	69.	.1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

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WinTR-20 Printed Page File      Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10                  0         0         0.05
KASSAB TRAVEL CTR
POSTRE DEVELOPED

SUB-AREA:
          DMA G     Outlet              .00181    92.       .1

STREAM REACH:

STORM ANALYSIS:
          2-Yr                          2.39      Type II   2

STRUCTURE RATING:


GLOBAL OUTPUT:
          2         0.05                YYYYN     YYYYNN



WinTR-20 Printed Page File      End of Input Data List

                                KASSAB TRAVEL CTR
                                POSTRE DEVELOPED

                           Name of printed page file:
                                TR20.out

                                        STORM 2-Yr
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Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA G	0.002		1.326		11.93	2.81	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.193	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.237	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.281	0.05	0.05	0.05	0.05	0.05	0.05	0.06
10.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.547	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.591	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.635	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.679	0.07	0.07	0.08	0.08	0.08	0.08	0.08
10.723	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.768	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.812	0.08	0.08	0.08	0.08	0.09	0.09	0.09
10.856	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.900	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.945	0.09	0.09	0.09	0.10	0.10	0.10	0.10
10.989	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.033	0.10	0.10	0.10	0.10	0.10	0.11	0.11
11.077	0.11	0.11	0.11	0.11	0.11	0.11	0.11
11.121	0.11	0.11	0.11	0.12	0.12	0.12	0.12
11.166	0.12	0.12	0.12	0.12	0.13	0.13	0.13
11.210	0.13	0.13	0.13	0.13	0.13	0.13	0.13
11.254	0.14	0.14	0.14	0.14	0.14	0.14	0.14
11.298	0.14	0.15	0.15	0.15	0.15	0.15	0.15
11.342	0.15	0.15	0.15	0.16	0.16	0.16	0.16
11.387	0.16	0.16	0.16	0.16	0.17	0.17	0.17
11.431	0.17	0.17	0.17	0.17	0.17	0.18	0.18
11.475	0.18	0.18	0.18	0.18	0.18	0.19	0.19
11.519	0.19	0.20	0.21	0.22	0.23	0.25	0.26
11.563	0.28	0.29	0.31	0.32	0.34	0.35	0.36
11.608	0.37	0.38	0.39	0.41	0.43	0.46	0.49
11.652	0.52	0.56	0.59	0.63	0.66	0.69	0.72
11.696	0.74	0.76	0.78	0.80	0.83	0.86	0.89

11.740	0.93	0.98	1.03	1.08	1.13	1.18	1.23
11.785	1.27	1.31	1.34	1.38	1.41	1.45	1.49
11.829	1.55	1.62	1.71	1.81	1.92	2.03	2.15
11.873	2.25	2.36	2.45	2.54	2.61	2.68	2.73
11.917	2.77	2.80	2.81	2.80	2.78	2.74	2.70

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.961	2.65	2.60	2.55	2.50	2.46	2.43	2.40
12.006	2.37	2.34	2.30	2.24	2.17	2.08	1.96
12.050	1.83	1.70	1.56	1.42	1.29	1.17	1.06
12.094	0.96	0.89	0.82	0.76	0.72	0.68	0.64
12.138	0.61	0.58	0.56	0.53	0.51	0.50	0.48
12.182	0.47	0.46	0.45	0.44	0.44	0.43	0.42
12.227	0.42	0.41	0.41	0.40	0.40	0.39	0.39
12.271	0.38	0.38	0.37	0.37	0.36	0.36	0.36
12.315	0.36	0.35	0.35	0.35	0.34	0.34	0.34
12.359	0.33	0.33	0.32	0.32	0.32	0.31	0.31
12.403	0.31	0.30	0.30	0.30	0.30	0.29	0.29
12.448	0.29	0.28	0.28	0.27	0.27	0.26	0.26
12.492	0.26	0.25	0.25	0.25	0.25	0.25	0.24
12.536	0.24	0.24	0.24	0.23	0.23	0.23	0.22
12.580	0.22	0.22	0.22	0.22	0.21	0.21	0.21
12.625	0.21	0.21	0.21	0.21	0.21	0.20	0.20
12.669	0.20	0.20	0.20	0.20	0.20	0.20	0.20
12.713	0.20	0.20	0.20	0.19	0.19	0.19	0.19
12.757	0.19	0.19	0.19	0.19	0.19	0.19	0.19
12.801	0.18	0.18	0.18	0.18	0.18	0.18	0.18
12.846	0.18	0.18	0.18	0.18	0.18	0.17	0.17
12.890	0.17	0.17	0.17	0.17	0.17	0.17	0.17
12.934	0.17	0.17	0.17	0.17	0.17	0.16	0.16
12.978	0.16	0.16	0.16	0.16	0.16	0.16	0.16
13.022	0.16	0.16	0.16	0.16	0.16	0.15	0.15
13.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.111	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.155	0.15	0.14	0.14	0.14	0.14	0.14	0.14
13.199	0.14	0.14	0.14	0.14	0.14	0.14	0.14
13.243	0.14	0.14	0.14	0.14	0.14	0.14	0.14
13.288	0.14	0.14	0.14	0.13	0.13	0.13	0.13
13.332	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.376	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.420	0.13	0.13	0.13	0.13	0.13	0.13	0.12
13.465	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.509	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.553	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.597	0.12	0.12	0.12	0.12	0.11	0.11	0.11
13.641	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.686	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.730	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.774	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.818	0.11	0.10	0.10	0.10	0.10	0.10	0.10
13.862	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.907	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.951	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.995	0.10	0.10	0.10	0.10	0.10	0.10	0.09
14.039	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.083	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.128	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.172	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.216	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.260	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.305	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.349	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.393	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.437	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.481	0.09	0.09	0.09	0.09	0.09	0.09	0.08
14.526	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.570	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.614	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.658	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.702	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.791	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.835	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.879	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.923	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.968	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.012	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.056	0.08	0.08	0.08	0.08	0.08	0.08	0.07
15.100	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.145	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.189	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.233	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.277	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.321	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.366	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.410	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.454	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.498	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

15.542	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.587	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.631	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.675	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.719	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.763	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.852	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.896	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.940	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.985	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.029	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.073	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.117	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.161	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.206	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.250	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.294	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.338	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.382	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.427	0.06	0.06	0.06	0.06	0.06	0.06	0.06

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
16.471	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.515	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.559	0.06	0.06	0.05	0.05	0.05	0.05	0.05
16.603	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.648	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.692	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.736	0.05	0.05	0.05	0.05	0.05	0.05	0.05

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

16.780	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.825	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.869	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.913	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.957	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.001	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.046	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.090	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.134	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.178	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.222	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.267	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.311	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.355	0.05	0.05	0.05	0.05			

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
OUTLET	0.002		1.326		11.93	2.81	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.193	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.237	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.281	0.05	0.05	0.05	0.05	0.05	0.05	0.06
10.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.547	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.591	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.635	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.679	0.07	0.07	0.08	0.08	0.08	0.08	0.08
10.723	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

10.768	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.812	0.08	0.08	0.08	0.08	0.09	0.09	0.09
10.856	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.900	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.945	0.09	0.09	0.09	0.10	0.10	0.10	0.10
10.989	0.10	0.10	0.10	0.10	0.10	0.10	0.10

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.033	0.10	0.10	0.10	0.10	0.10	0.11	0.11
11.077	0.11	0.11	0.11	0.11	0.11	0.11	0.11
11.121	0.11	0.11	0.11	0.12	0.12	0.12	0.12
11.166	0.12	0.12	0.12	0.12	0.13	0.13	0.13
11.210	0.13	0.13	0.13	0.13	0.13	0.13	0.13
11.254	0.14	0.14	0.14	0.14	0.14	0.14	0.14
11.298	0.14	0.15	0.15	0.15	0.15	0.15	0.15
11.342	0.15	0.15	0.15	0.16	0.16	0.16	0.16
11.387	0.16	0.16	0.16	0.16	0.17	0.17	0.17
11.431	0.17	0.17	0.17	0.17	0.17	0.18	0.18
11.475	0.18	0.18	0.18	0.18	0.18	0.19	0.19
11.519	0.19	0.20	0.21	0.22	0.23	0.25	0.26
11.563	0.28	0.29	0.31	0.32	0.34	0.35	0.36
11.608	0.37	0.38	0.39	0.41	0.43	0.46	0.49
11.652	0.52	0.56	0.59	0.63	0.66	0.69	0.72
11.696	0.74	0.76	0.78	0.80	0.83	0.86	0.89
11.740	0.93	0.98	1.03	1.08	1.13	1.18	1.23
11.785	1.27	1.31	1.34	1.38	1.41	1.45	1.49
11.829	1.55	1.62	1.71	1.81	1.92	2.03	2.15
11.873	2.25	2.36	2.45	2.54	2.61	2.68	2.73
11.917	2.77	2.80	2.81	2.80	2.78	2.74	2.70
11.961	2.65	2.60	2.55	2.50	2.46	2.43	2.40

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

12.006	2.37	2.34	2.30	2.24	2.17	2.08	1.96
12.050	1.83	1.70	1.56	1.42	1.29	1.17	1.06
12.094	0.96	0.89	0.82	0.76	0.72	0.68	0.64
12.138	0.61	0.58	0.56	0.53	0.51	0.50	0.48
12.182	0.47	0.46	0.45	0.44	0.44	0.43	0.42
12.227	0.42	0.41	0.41	0.40	0.40	0.39	0.39
12.271	0.38	0.38	0.37	0.37	0.36	0.36	0.36
12.315	0.36	0.35	0.35	0.35	0.34	0.34	0.34
12.359	0.33	0.33	0.32	0.32	0.32	0.31	0.31
12.403	0.31	0.30	0.30	0.30	0.30	0.29	0.29
12.448	0.29	0.28	0.28	0.27	0.27	0.26	0.26
12.492	0.26	0.25	0.25	0.25	0.25	0.25	0.24
12.536	0.24	0.24	0.24	0.23	0.23	0.23	0.22
12.580	0.22	0.22	0.22	0.22	0.21	0.21	0.21
12.625	0.21	0.21	0.21	0.21	0.21	0.20	0.20
12.669	0.20	0.20	0.20	0.20	0.20	0.20	0.20
12.713	0.20	0.20	0.20	0.19	0.19	0.19	0.19
12.757	0.19	0.19	0.19	0.19	0.19	0.19	0.19
12.801	0.18	0.18	0.18	0.18	0.18	0.18	0.18
12.846	0.18	0.18	0.18	0.18	0.18	0.17	0.17
12.890	0.17	0.17	0.17	0.17	0.17	0.17	0.17
12.934	0.17	0.17	0.17	0.17	0.17	0.16	0.16
12.978	0.16	0.16	0.16	0.16	0.16	0.16	0.16
13.022	0.16	0.16	0.16	0.16	0.16	0.15	0.15
13.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.111	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.155	0.15	0.14	0.14	0.14	0.14	0.14	0.14
13.199	0.14	0.14	0.14	0.14	0.14	0.14	0.14
13.243	0.14	0.14	0.14	0.14	0.14	0.14	0.14

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

13.288	0.14	0.14	0.14	0.13	0.13	0.13	0.13
13.332	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.376	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.420	0.13	0.13	0.13	0.13	0.13	0.13	0.12
13.465	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.509	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.553	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.597	0.12	0.12	0.12	0.12	0.11	0.11	0.11
13.641	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.686	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.730	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.774	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.818	0.11	0.10	0.10	0.10	0.10	0.10	0.10
13.862	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.907	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.951	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.995	0.10	0.10	0.10	0.10	0.10	0.10	0.09
14.039	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.083	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.128	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.172	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.216	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.260	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.305	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.349	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.393	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.437	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.481	0.09	0.09	0.09	0.09	0.09	0.09	0.08
14.526	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.570	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.614	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.658	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.702	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.791	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.835	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.879	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

14.923	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.968	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.012	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.056	0.08	0.08	0.08	0.08	0.08	0.08	0.07
15.100	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.145	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.189	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.233	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.277	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.321	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.366	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.410	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.454	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.498	0.07	0.07	0.07	0.07	0.07	0.07	0.07

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.542	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.587	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.631	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.675	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.719	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.763	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.852	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.896	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.940	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.985	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.029	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.073	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.117	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

16.161	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.206	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.250	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.294	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.338	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.382	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.427	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.471	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.515	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.559	0.06	0.06	0.05	0.05	0.05	0.05	0.05
16.603	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.648	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.692	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.736	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.780	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.825	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.869	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.913	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.957	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.001	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.046	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.090	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.134	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.178	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.222	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.267	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.311	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.355	0.05	0.05	0.05	0.05			

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA G	0.002		2.81				
OUTLET	0.002		2.81				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

User Inputs

Chamber Model	MC-3500
Outlet Control Structure	Yes (Outlet)
Project Name	KASSAB -DMA A
Project Location	RIVERSIDE DR, RIVERSIDE
Project Date	11/07/2018
Engineer	RRF
Measurement Type	Imperial
Required Storage Volume	2600 cubic ft.
Stone Porosity	40%
Stone Above Chambers	12 in.
Stone Foundation Depth	9 in.
Average Cover Over Chambers	24 in.
Design Constraint	Length
Design Constraint Dimension	50 ft.

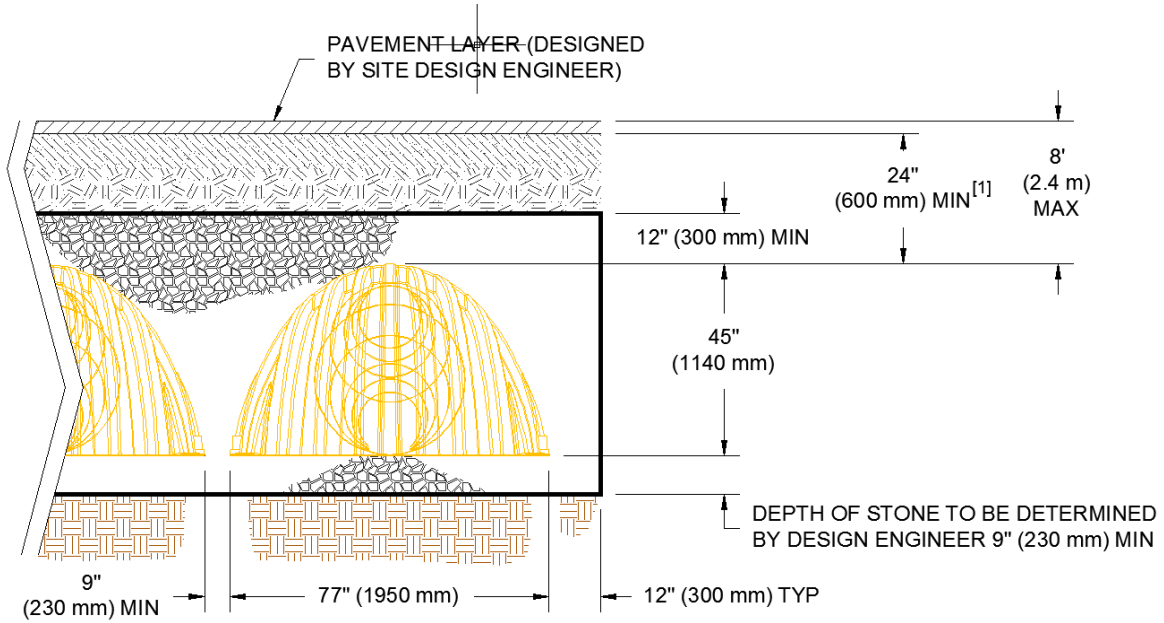
Results

System Volume and Bed Size

Installed Storage Volume	2675 cubic ft.
Storage Volume Per Chamber	178.9 cubic ft.
Storage Volume Per End Cap	46.9 cubic ft.
Number Of Chambers Required	11 each
Number Of End Caps Required	6 each
Rows/Chambers	2 row(s) of 5 chamber(s)
Leftover Rows/Chambers	1 row(s) of 1 chamber(s)
Maximum Length	45.14 ft.
Maximum Width	23.35 ft.
Approx. Bed Size Required	861 square ft.

System Components

Amount Of Stone Required	127 cubic yards
Volume Of Excavation (Not Including Fill)	175 cubic yards
Non-woven Filter Fabric Required	269 square yards
Length Of Isolator Row	39.53 ft.
Woven Isolator Row Fabric	74 square yards



[1] - TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

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ADVANCED DRAINAGE SYSTEMS, INC.

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KASSAB -DMA A

RIVERSIDE DR, RIVERSIDE

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING..
10. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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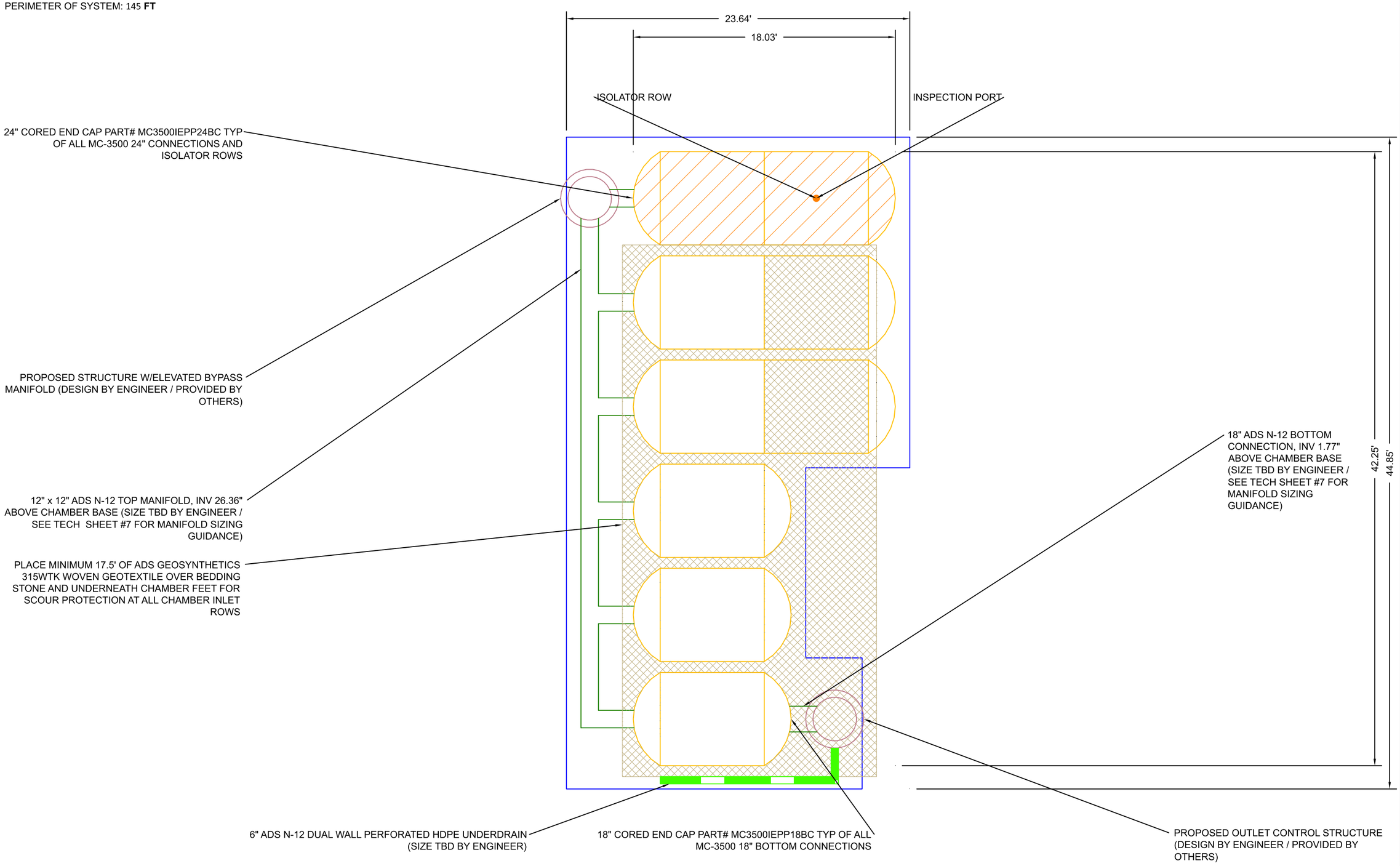
CONCEPTUAL LAYOUT

(9) STORMTECH MC-3500 CHAMBERS
(12) STORMTECH MC-3500 END CAPS
INSTALLED WITH 12 " COVER STONE, 9 " BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 2762 CF
AREA OF SYSTEM: 937 **FT²**
PERIMETER OF SYSTEM: 145 **FT**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



KASSAB -DMA A
RIVERSIDE DR, RIVERSIDE

DATE: 11/07/2018 | DRAWN: RF | CHECKED: ---
PROJECT #: Tool

REV	DRW	CHK	DESCRIPTION

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

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ADS®
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

NOT TO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH MC-□500 CHAMBER SYSTEMS

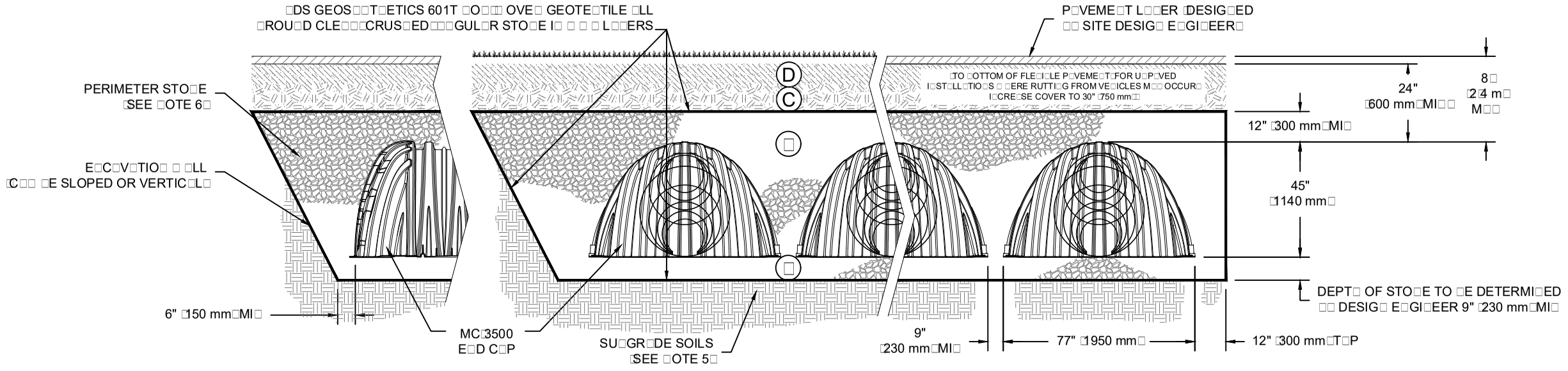
M□TERI□L LOC□TIO□		DESCRIPTIO□	□□S□TO M□TERI□L CL□SSIFIC□TIO□S	COMP□CTIO□ □DE□SIT□ RE□UIREME□T
D	**FINAL FILL:** FILL M□TERI□L FOR L□□ER □D□ST□RTS FROM T□E TOP OF T□E □C□L□□ER TO T□E □OTTOM OF FLE□I□LE P□VEME□T OR U□P□VED FI□IS□ED GR□DE □□OVE□□OTE T□□T P□VEME□T SU□□□SE M□□ □E P□RT OF T□E □D□L□□ER	□□□ SOIL□ROC□ M□TERI□LS□□□TIVE SOILS□OR PER E□GI□EER'S PL□□S□C□EC□ PL□□S FOR P□VEME□T SU□GR□DE RE□UIREME□TS□	□□	PREP□RE PER SITE DESIG□ E□GI□EER'S PL□□S□ P□VED I□ST□LL□TIO□S M□□ □□VE STRI□GE□T M□TERI□L □□D PREP□R□TIO□ RE□UIREME□TS□
C	**INITIAL FILL:** FILL M□TERI□L FOR L□□ER □C□ ST□RTS FROM T□E TOP OF T□E EM□EDME□T STO□E □TO L□□ER□TO 24" □600 mm□□□OVE T□E TOP OF T□E C□□M□ER□□OTE T□□T P□VEME□T SU□□□SE M□□ □E □ P□RT OF T□E □C□L□□ER□	GR□□UL□R □ ELL□GR□DED SOIL□GGREG□TE MI□TURES□□35□ FI□ES OR PROCESSED □GGREG□TE□ MOST P□VEME□T SU□□□SE M□TERI□LS C□□ □E USED I□ LIEU OF T□IS L□□ER□	□□S□TO M145[1] □1□□2□4□□3 OR □□S□TO M43[1] 3□357□4□467□5□56□57□6□67□68□7□78□8□89□ 9□10	□EGI□ COMP□CTIO□S □FTER 24" □600 mm□OF M□TERI□L OVER T□E C□□M□ERS IS RE□C□ED□ COMP□CT □DDITIO□□L L□□ERS I□ 12" □300 mm□ M□□ LIFTS TO □ MI□□95□ PROCTOR DE□SIT□ FOR □ ELL GR□DED M□TERI□L □□D 95□ REL□TIVE DE□SIT□ FOR PROCESSED □GGREG□TE M□TERI□LS□
□	**EMBEDMENT STONE:** FILL SURROU□DI□G T□E C□□M□ERS FROM T□E FOU□D□TIO□ STO□E □TO L□□ER□TO T□E □C□L□□ER □□OVE□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43[1] 3□4	□O COMP□CTIO□ RE□UIRED□
□	**FOUNDATION STONE:** FILL □ELO□ C□□M□ERS FROM T□E SU□GR□DE UP TO T□E FOOT □OTTOM□ OF T□E C□□M□ER□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43[1] 3□4	PL□TE COMP□CT OR ROLL TO □C□IEVE □ FL□T SURFACE. [2 3]

PLE□SE □OTE□

1□ T□E LISTED □□S□TO DESIG□□TIO□S □RE FOR GR□D□TIO□S O□L□□T□E STO□E MUST □LSO □E CLE□□□CRUS□ED□□□GUL□R□FOR E□□MPLE□□ SPECIFIC□TIO□ FOR □4 STO□E □ OULD ST□TE"CLE□□□CRUS□ED□ □□GUL□R □O□4 □□S□TO M43□STO□E"□

2□ STORMTEC□ COMP□CTIO□ RE□UIREME□TS □RE MET FOR □□LOC□TIO□ M□TERI□LS □ □E□ PL□CED □□D COMP□CTED I□ 9" □230 mm□M□□□LIFTS USI□G T□ O FULL COVER□GES □ IT□ □ VI□R□TOR□ COMP□CTOR□

3□ □ □ERE I□FILTR□TIO□ SURF□CES M□□ □E COMPROMISED □□ COMP□CTIO□□FOR ST□□D□RD DESIG□ LO□D CO□DITIO□S□□ FL□T SURF□CE M□□ □E □C□IEVED □□ R□□I□G OR DR□GGI□G □ IT□OUT COMP□CTIO□ E□UIPME□T□FOR SPECI□L LO□D DESIG□S□CO□T□CT STORMTEC□ FOR COMP□CTIO□ RE□UIREME□TS□



NOTES:

1□ MC□3500 C□□M□ERS S□□LL CO□FORM TO T□E RE□UIREME□TS OF □STM F2418 "ST□□D□RD SPECIFIC□TIO□ FOR POL□PROP□LE□E □PP□CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

2□ MC□3500 C□□M□ERS S□□LL □E DESIG□ED I□ □CCORD□□CE □ IT□ □STM F2787 "ST□□D□RD PR□CTICE FOR STRUCTUR□L DESIG□ OF T□ERMOPL□STIC CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

3□ "□CCEPT□□LE FILL M□TERI□LS" T□□LE □□OVE PROVIDES M□TERI□L LOC□TIO□S□DESCRIPTIO□S□GR□D□TIO□S□□□D COMP□CTIO□ RE□UIREME□TS FOR FOU□D□TIO□□EM□EDME□T□□□D FILL M□TERI□LS□

4□ T□E "SITE DESIG□ E□GI□EER" REFERS TO T□E E□GI□EER RESPO□SI□LE FOR T□E DESIG□ □□D L□□OUT OF T□E STORMTEC□ C□□M□ERS FOR T□IS PROJECT□

5□ T□E SITE DESIG□ E□GI□EER IS RESPO□SI□LE FOR □SSESSI□G T□E □E□RI□G RESIST□□CE □□LLO□ □□LE □E□RI□G C□P□CIT□□OF T□E SU□GR□DE SOILS □□D T□E DEPT□ OF FOU□D□TIO□ STO□E □ IT□ CO□SIDER□TIO□ FOR T□E R□□GE OF E□PECTED SOIL MOISTURE CO□DITIO□S□

6□ PERIMETER STO□E MUST □E E□TE□DED □ORI□O□T□LL□ TO T□E E□C□V□TIO□ □ □LL FOR □OT□ VERTIC□L □□D SLOPED E□C□V□TIO□ □ □LLS□

7□ O□CE L□□ER □C□IS PL□CED□□□□ SOIL□M□TERI□L C□□ □E PL□CED I□ L□□ER □D□UP TO T□E FI□IS□ED GR□DE□MOST P□VEME□T SU□□□SE SOILS C□□ □E USED TO REPL□CE T□E M□TERI□L RE□UIREME□TS OF L□□ER □C□ OR □D□□T T□E SITE DESIG□ E□GI□EER'S DISCRETIO□□

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PROJECT □□Tool

REV	DR□	C□□	DESCRIPTIO□

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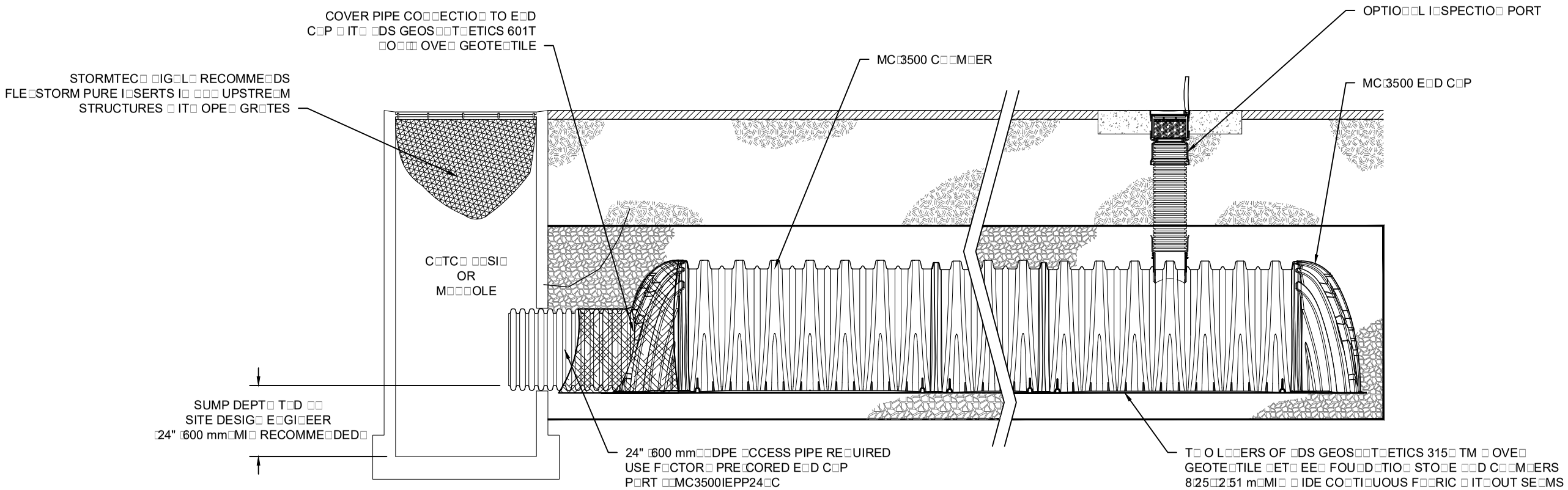
T□IS DR□□ I□G □□S □EE□ PREP□RED □□SED O□ I□FORM□TIO□ PROVIDED TO □DS U□DER T□E DIRECTIO□ OF T□E SITE DESIG□ E□GI□EER OR OT□ER PR RESPO□SI□ILIT□ OF T□E SITE DESIG□ E□GI□EER TO E□SURE T□□T T□E PRODUCT□S DEPICTED □□D □LL □SSOCI□TED DET□ILS MEET □LL □PPLIC□□LE L

SHEET
3 OF 6



MC-□500 ISOLATOR ROW DETAIL

□TS

INSPECTION & MAINTENANCE

STEP 1□ I□SPECT ISOL□TOR RO□ FOR SEDIME□T
□□ I□SPECTIO□ PORTS □IF PRESE□T□
□□1□ REMOVE□OPE□ LID O□ □□LOPL□ST I□LI□E DR□I□
□□2□ REMOVE □□D CLE□□ FLE□STORM FILTER IF I□ST□LLED
□□3□ USI□G □ FL□S□LIG□T □□D ST□DI□ ROD□ME□SURE DEPT□ OF SEDIME□T □□D RECORD O□ M□I□TE□□□CE LOG
□□4□ LO□ ER □ C□MER□ I□TO ISOL□TOR RO□ FOR VISU□L I□SPECTIO□ OF SEDIME□T LEVELS □OPTIO□□L□
□□5□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□
□□ □LL ISOL□TOR RO□ S
□□1□ REMOVE COVER FROM STRUCTURE □T UPSTRE□M E□D OF ISOL□TOR RO□
□□2□ USI□G □ FL□S□LIG□T□I□SPECT DO□ □ T□E ISOL□TOR RO□ T□ROUG□ OUTLET PIPE
i□ MIRRORS O□ POLES OR C□MER□S M□□ □E USED TO □VOID □ CO□FI□ED SP□CE E□TR□
ii□ FOLLO□ OS□□ REGUL□TIO□S FOR CO□FI□ED SP□CE E□TR□ IF E□TERI□G M□□□OLE
□□3□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□

STEP 2□ CLE□□ OUT ISOL□TOR RO□ USI□G T□E JETV□C PROCESS
□□ □ FI□ED CULVERT CLE□□I□G □O□□LE □ IT□ RE□R F□CI□G SPRE□D OF 45" □1□1 m□OR MORE IS PREFERRED
□□ □PPL□ MULTIPLE P□SSES OF JETV□C U□TIL □□C□FLUS□ □ □TER IS CLE□□
C□ V□CUUM STRUCTURE SUMP □S RE□UIRED

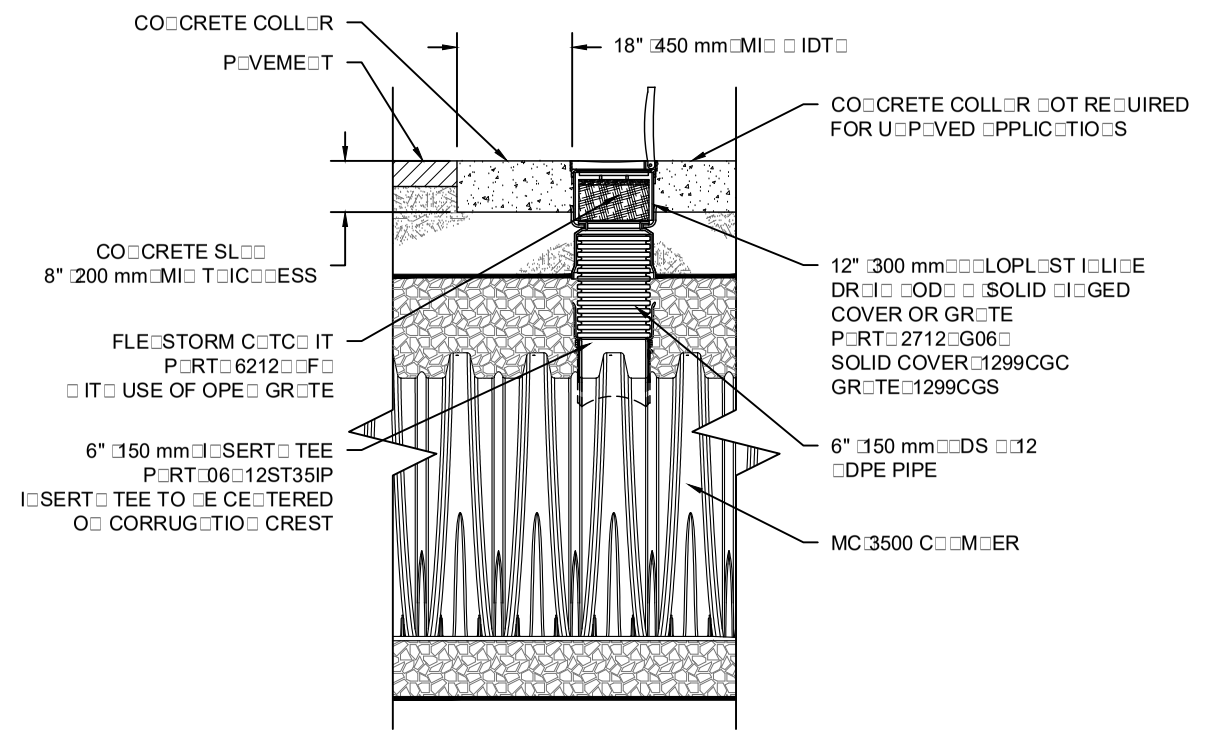
STEP 3□ REPL□CE □LL COVERS□GR□TES□FILTERS□□□D LIDS□RECORD O□SERV□TIO□S □□D □CTIO□S□

STEP 4□ I□SPECT □□D CLE□□ □□SI□S □□D M□□□OLES UPSTRE□M OF T□E STORMTEC□ S□STEM□

NOTES

1□ I□SPECT EVER□ 6 MO□T□S DURI□G T□E FIRST □E□R OF OPER□TIO□□□DJUST T□E I□SPECTIO□ I□TERV□L □□SED O□ PREVIOUS O□SERV□TIO□S OF SEDIME□T □CCUMUL□TIO□ □□D □IG□ □ □TER ELEV□TIO□S□

2□ CO□DUCT JETTI□G □□D V□CTORI□G □□□U□LL□ OR □ □E□ I□SPECTIO□ S□O□ S T□□T M□I□TE□□□CE IS □ECESS□R□□



MC-□500 6" INSPECTION PORT DETAIL

□TS

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D□TE□ 11/07/2018 | DR□□ □□ RF
PROJECT □□Tool | C□EC□ED□ □□□

REV	DR□	C□□	DESCRIPTIO□

T□IS DR□□ I□G □□S □EE□ PREP□RED □□SED O□ I□FORM□TIO□ PROVIDED TO □DS U□DER T□E DIRECTIO□ OF T□E SITE DESIG□ E□GI□EER S□□LL REVIE□ T□IS DR□□I□G PRIOR TO CO□STRUCTIO□ □IT IS T□E ULTIM□TE RESPO□SI□ILIT□ OF T□E SITE DESIG□ E□GI□EER TO E□SURE T□□T T□E PRODUCT S□ DEPICTED □□D □LL □SSOCI□TED DET□ILS MEET □LL □PPLIC□□LE □□S□REGUL□TIO□S□ □S□□□D PROJECT RE□UIREME□TS□

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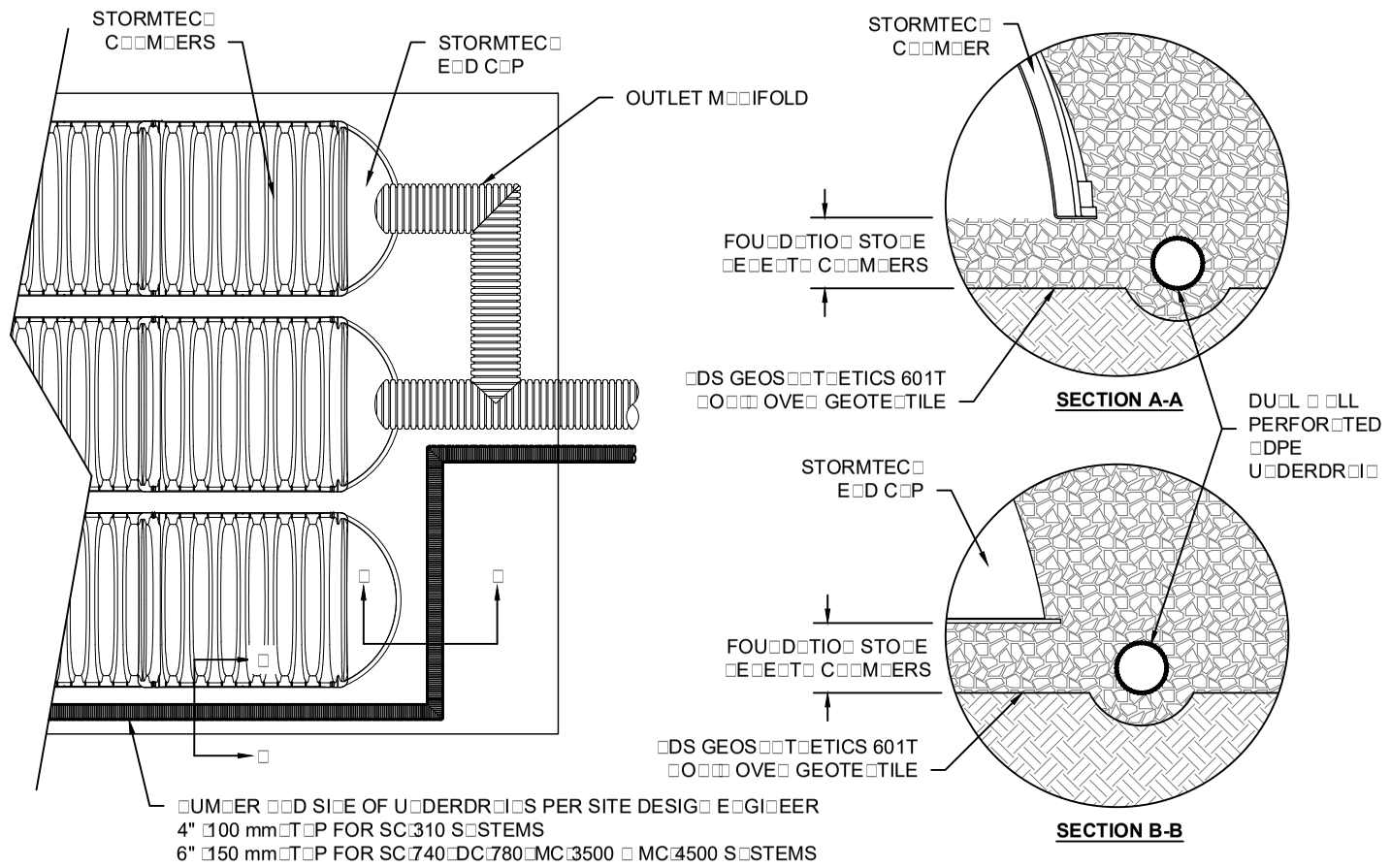
SHEET
4 OF 6

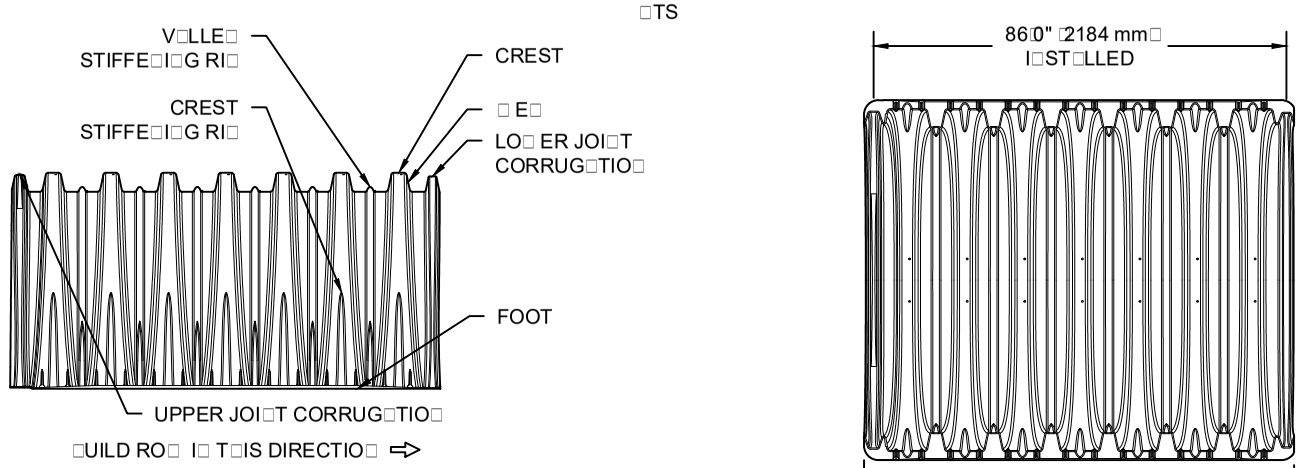
UNDERDRAIN DETAIL

□TS



MC-□500 TECHNICAL SPECIFICATION

□TS



NOMINAL CHAMBER SPECIFICATIONS

SI□E □ □ □ □ I□ST□LLED LE□GT□□	77□0" □ 45□0" □ 86□0"	□1956 mm □ 1143 mm □ 2184 mm□
C□□M□ER STOR□GE	109□9 CU□IC FEET	(3.11 m³)
MI□IMUM I□ST□LLED STOR□GE□	178□9 CU□IC FEET	(5.06 m³)
□ EIG□T	135□0 I□s□	□61□2 □g□

NOMINAL END CAP SPECIFICATIONS

SI□E □ □ □ □ I□ST□LLED LE□GT□□	77□0" □ 45□0" □ 22□5"	□1956 mm □ 1143 mm □ 571 mm□
E□D C□P STOR□GE	14□9 CU□IC FEET	(0.42 m³)
MI□IMUM I□ST□LLED STOR□GE□	46□0 CU□IC FEET	(1.30 m³)
□ EIG□T	50□0 I□s□	□22□7 □g□

□□SSUMES 12" □305 mm□STO□E □□OVE□9" □229 mm□STO□E FOU□D□TIO□ □□D □ET□ EE□ C□□M□ERS□
12" □305 mm□STO□E PERIMETER I□ FRO□T OF E□D C□PS □□D 40□ STO□E POROSIT□

STU□S □T □OTTOM OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "□"
STU□S □T TOP OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "T"

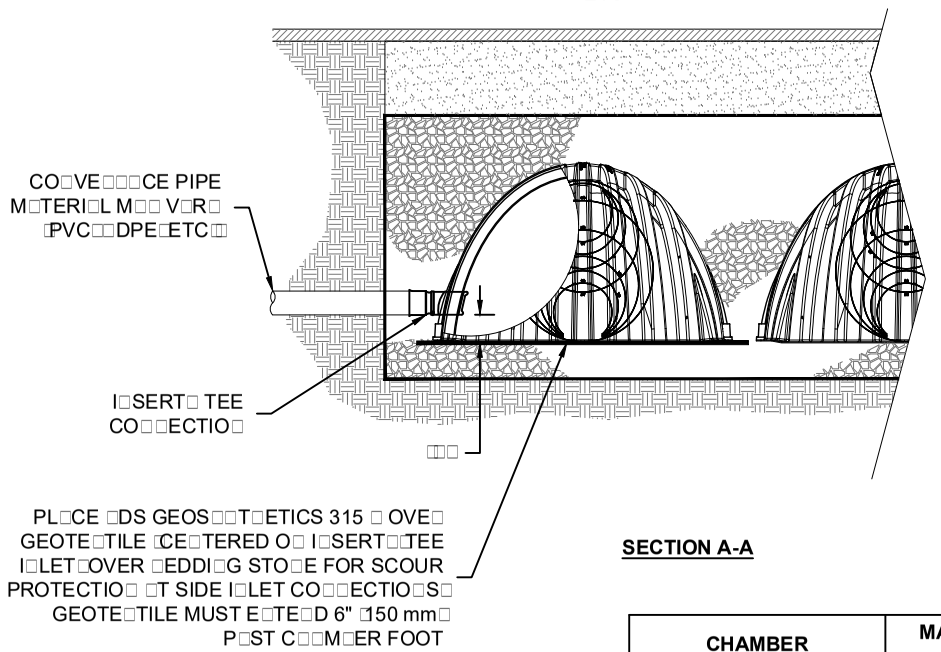
PART #	STUB	B	C
MC3500IEPP06T	6" □150 mm□	33□21" □844 mm□	□□□
MC3500IEPP06□		□□□	0□66" □17 mm□
MC3500IEPP08T	8" □200 mm□	31□16" □791 mm□	□□□
MC3500IEPP08□		□□□	0□81" □21 mm□
MC3500IEPP10T	10" □250 mm□	29□04" □738 mm□	□□□
MC3500IEPP10□		□□□	0□93" □24 mm□
MC3500IEPP12T	12" □300 mm□	26□36" □670 mm□	□□□
MC3500IEPP12□		□□□	1□35" □34 mm□
MC3500IEPP15T	15" □375 mm□	23□39" □594 mm□	□□□
MC3500IEPP15□		□□□	1□50" □38 mm□
MC3500IEPP18TC	18" □450 mm□	20□03" □509 mm□	□□□
MC3500IEPP18□C		□□□	1□77" □45 mm□
MC3500IEPP24TC	24" □600 mm□	14□48" □368 mm□	□□□
MC3500IEPP24□C		□□□	2□06" □52 mm□
MC3500IEPP30□C	30" □750 mm□	□□□	

□OTE□□LL DIME□SIO□S □RE □OMI□□L

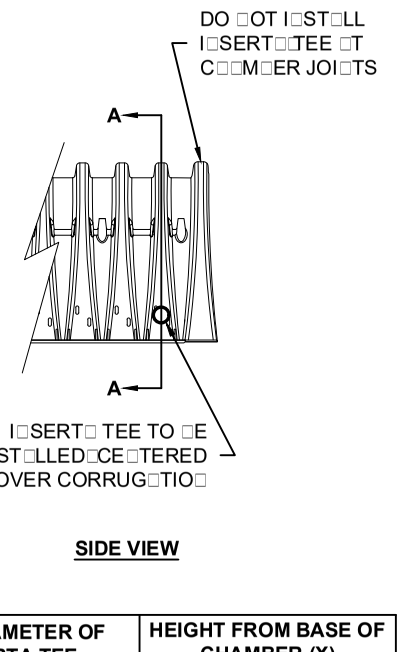
CUSTOM PRECORED I□VERTS □RE □V□IL□□LE UPO□ RE□UEST□I□VE□TORIED M□□IFOLDS I□CLUDE 12□24" □300□600 mm□SI□E O□ SI□E □□D 15□48" □375□1200 mm□ECCE□TRIC M□□IFOLDS□
CUSTOM I□VERT LOC□TIO□S O□ T□E MC□3500 E□D C□P CUT I□ T□E FIELD □RE □OT RECOMME□DED FOR PIPE SI□ES GRE□TER T□□□ 10" □250 mm□
T□E I□VERT LOC□TIO□ I□ COLUM□ □□□RE T□E □IG□TEST POSSI□LE FOR T□E PIPE SI□E□

INSERTA TEE DETAIL

□TS



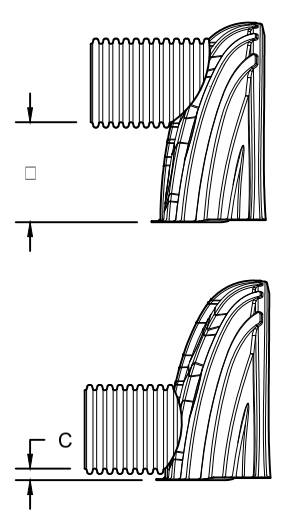
SECTION A-A



SIDE VIEW

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC□310	6" □150 mm□	4" □100 mm□
SC□740	10" □250 mm□	4" □100 mm□
DC□780	10" □250 mm□	4" □100 mm□
MC□3500	12" □300 mm□	6" □150 mm□
MC□4500	12" □300 mm□	8" □200 mm□
I□SERT□ TEE FITTI□GS □V□IL□□LE FOR SDR 26□SDR 35□SC□ 40 IPS G□S□ETED □ SOLVE□T □ ELD□□12□□P STORM□C□900 OR DUCTILE IRO□		

NOTE:
P□RT □UM□ERS □ ILL V□R□ □□SED O□ I□LET PIPE M□TERI□LS□ CO□T□CT STORMTEC□ FOR MORE I□FORM□TIO□□



KASSAB -DMA A
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PROJECT □□Tool

REV | DR□ | C□□ | DESCRIPTIO□

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SHEET
5 OF 6

MC-SERIES END CAP INSERTION DETAIL

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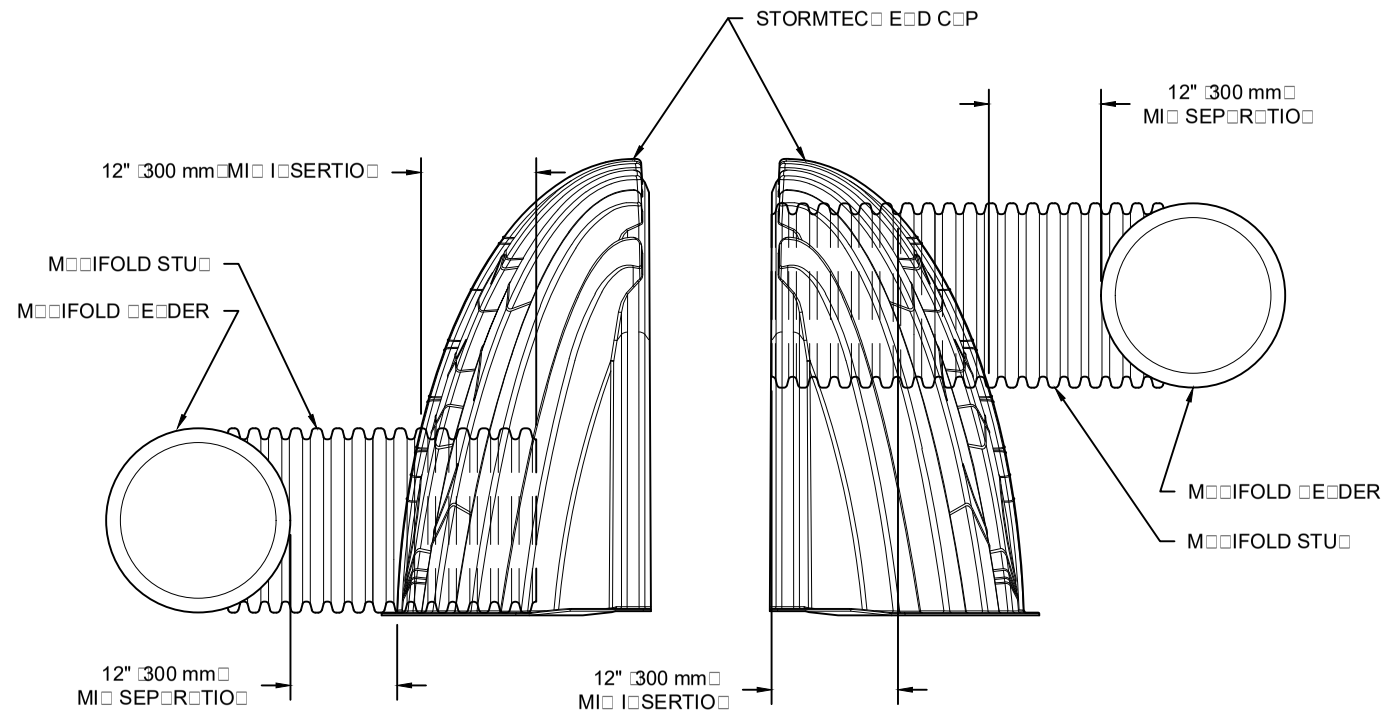

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KASSAB -DMA A
RIVERSIDE DR, RIVERSIDE

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User Inputs

Chamber Model	MC-3500
Outlet Control Structure	Yes (Outlet)
Project Name	KASSAB -DMA D TO H
Project Location	RIVERSIDE DR, RIVERSIDE
Project Date	11/07/2018
Engineer	RRF
Measurement Type	Imperial
Required Storage Volume	5600 cubic ft.
Stone Porosity	40%
Stone Above Chambers	12 in.
Stone Foundation Depth	9 in.
Average Cover Over Chambers	24 in.
Design Constraint	Length
Design Constraint Dimension	50 ft.

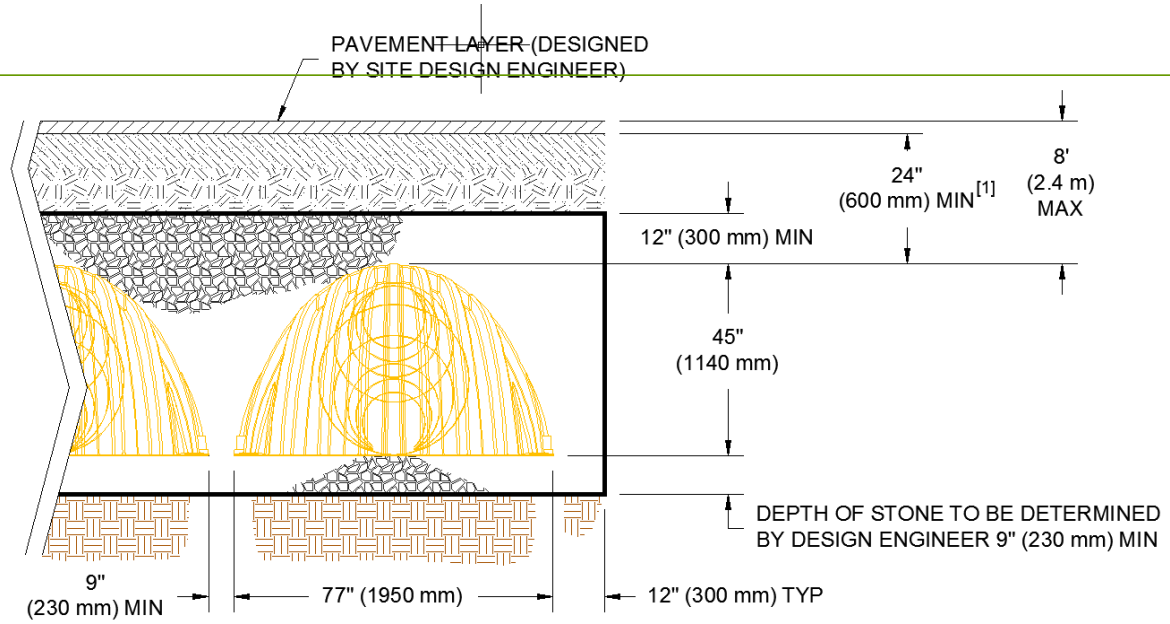
Results

System Volume and Bed Size

Installed Storage Volume	5853 cubic ft.
Storage Volume Per Chamber	178.9 cubic ft.
Storage Volume Per End Cap	46.9 cubic ft.
Number Of Chambers Required	26 each
Number Of End Caps Required	12 each
Rows/Chambers	5 row(s) of 5 chamber(s)
Leftover Rows/Chambers	1 row(s) of 1 chamber(s)
Maximum Length	45.14 ft.
Maximum Width	44.85 ft.
Approx. Bed Size Required	1832 square ft.

System Components

Amount Of Stone Required	261 cubic yards
Volume Of Excavation (Not Including Fill)	373 cubic yards
Non-woven Filter Fabric Required	511 square yards
Length Of Isolator Row	39.53 ft.
Woven Isolator Row Fabric	74 square yards



[1] - TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

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KASSAB -DMA DTO H

RIVERSIDE DR, RIVERSIDE

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

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IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTITIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

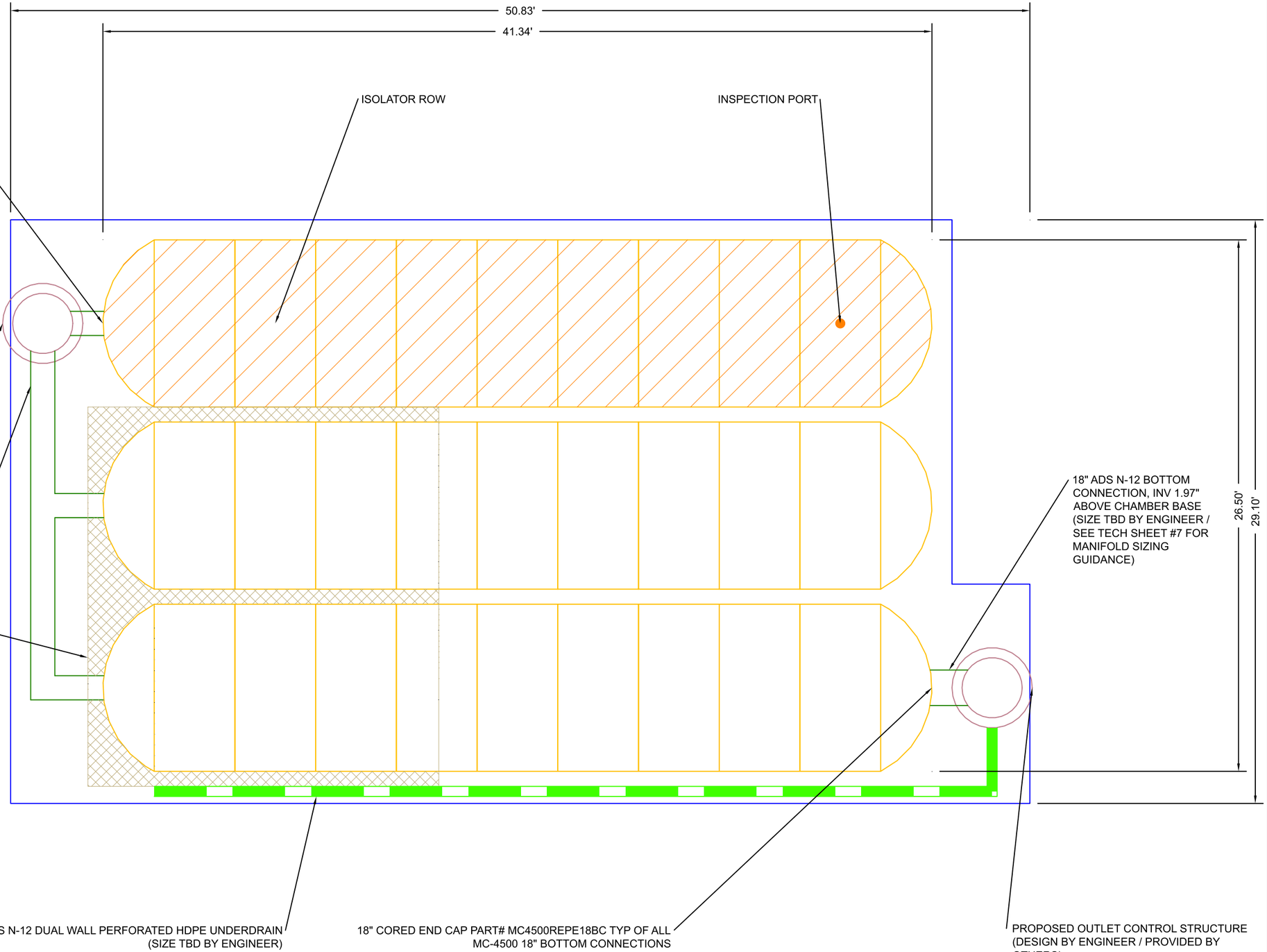
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

(27) STORMTECH MC-4500 CHAMBERS
(6) STORMTECH MC-4500 END CAPS
INSTALLED WITH 12 " COVER STONE, 9 " BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 5657 CF
AREA OF SYSTEM: 1409 **FT²**
PERIMETER OF SYSTEM: 160 **FT**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



KASSAB -DMA DTO H
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DATE: 11/07/2018 | DRAWN: RF | CHECKED: ---
PROJECT #: Tool

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NOT TO SCALE

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

M□TERI□L LOC□TIO□		DESCRIPTIO□	□□S□TO M□TERI□L CL□SSIFIC□TIO□S	COMP□CTIO□ □DE□SIT□ RE□UIREME□T
D	**FINAL FILL:** FILL M□TERI□L FOR L□□ER □D□ST□RTS FROM T□E TOP OF T□E □C□L□□ER TO T□E □OTTOM OF FLE□I□LE P□VEME□T OR U□P□VED FI□IS□ED GR□DE □□OVE□□OTE T□□T P□VEME□T SU□□□SE M□□ □E P□RT OF T□E □D□L□□ER	□□□ SOIL□ROC□ M□TERI□LS□□□TIVE SOILS□OR PER E□GI□EER'S PL□□S□C□EC□ PL□□S FOR P□VEME□T SU□GR□DE RE□UIREME□TS□	□□	PREP□RE PER SITE DESIG□ E□GI□EER'S PL□□S□ P□VED I□ST□LL□TIO□S M□□ □□VE STRI□GE□T M□TERI□L □□D PREP□R□TIO□ RE□UIREME□TS□
C	**INITIAL FILL:** FILL M□TERI□L FOR L□□ER □C□ ST□RTS FROM T□E TOP OF T□E EM□EDME□T STO□E □□L□□ER□TO 24" □600 mm□□□OVE T□E TOP OF T□E C□□M□ER□□OTE T□□T P□VEME□T SU□□□SE M□□ □E □ P□RT OF T□E □C□L□□ER□	GR□□UL□R □ ELL□GR□DED SOIL□□GGREG□TE MI□TURES□□35□ FI□ES OR PROCESSED □GGREG□TE□ MOST P□VEME□T SU□□□SE M□TERI□LS C□□ □E USED I□ LIEU OF T□IS L□□ER□	□□S□TO M145¹ □1□□2□4□□3 OR □□S□TO M43¹ 3□357□4□467□5□56□57□6□67□68□7□78□8□89□ 9□10	□EGI□ COMP□CTIO□S □FTER 24" □600 mm□OF M□TERI□L OVER T□E C□□M□ERS IS RE□C□ED□ COMP□CT □DDITIO□□L L□□ERS I□ 12" □300 mm□ M□□ LIFTS TO □ MI□□95□ PROCTOR DE□SIT□ FOR □ ELL GR□DED M□TERI□L □□D 95□ REL□TIVE DE□SIT□ FOR PROCESSED □GGREG□TE M□TERI□LS□
□	**EMBEDMENT STONE:** FILL SURROU□DI□G T□E C□□M□ERS FROM T□E FOU□D□TIO□ STO□E □□□ L□□ER□TO T□E □C□L□□ER □□OVE□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43¹ 3□4	□O COMP□CTIO□ RE□UIRED□
□	**FOUNDATION STONE:** FILL □ELO□ C□□M□ERS FROM T□E SU□GR□DE UP TO T□E FOOT □□OTTOM□ OF T□E C□□M□ER□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43¹ 3□4	PL□TE COMP□CT OR ROLL TO □C□IEVE □ FL□T SURFACE. ²³

PLE□SE □OTE□

1□ T□E LISTED □□S□TO DESIG□□TIO□S □RE FOR GR□D□TIO□S O□L□□T□E STO□E MUST □LSO □E CLE□□□CRUS□ED□□□GUL□R□FOR E□□MPLE□□ SPECIFIC□TIO□ FOR □4 STO□E □ OULD ST□TE"CLE□□□CRUS□ED□ □□GUL□R □O□4 □□S□TO M43□STO□E"□

2□ STORMTEC□ COMP□CTIO□ RE□UIREME□TS □RE MET FOR □□LOC□TIO□ M□TERI□LS □ □E□ PL□CED □□D COMP□CTED I□ 9" □230 mm□M□□□LIFTS USI□G T□ O FULL COVER□GES □ IT□ □ VI□R□TOR□ COMP□CTOR□

3□ □ □ERE I□FILTR□TIO□ SURF□CES M□□ □E COMPROMISED □□ COMP□CTIO□□FOR ST□□D□RD DESIG□ LO□D CO□DITIO□S□□ FL□T SURF□CE M□□ □E □C□IEVED □□ R□□I□G OR DR□GGI□G □ IT□OUT COMP□CTIO□ E□UIPME□T□FOR SPECI□L LO□D DESIG□S□CO□T□CT STORMTEC□ FOR COMP□CTIO□ RE□UIREME□TS□

NOTES:

1□ MC□4500 C□□M□ERS S□□LL CO□FORM TO T□E RE□UIREME□TS OF □STM F2418 "ST□□D□RD SPECIFIC□TIO□ FOR POL□PROP□LE□E □PP□CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

2□ MC□4500 C□□M□ERS S□□LL □E DESIG□ED I□ □CCORD□□CE □ IT□ □STM F2787 "ST□□D□RD PR□CTICE FOR STRUCTUR□L DESIG□ OF T□ERMOPL□STIC CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

3□ "□CCEPT□□LE FILL M□TERI□LS" T□□LE □□OVE PROVIDES M□TERI□L LOC□TIO□S□DESCRIPTIO□S□GR□D□TIO□S□□□D COMP□CTIO□ RE□UIREME□TS FOR FOU□D□TIO□□EM□EDME□T□□□D FILL M□TERI□LS□

4□ T□E "SITE DESIG□ E□GI□EER" REFERS TO T□E E□GI□EER RESPO□SI□LE FOR T□E DESIG□ □□D L□□OUT OF T□E STORMTEC□ C□□M□ERS FOR T□IS PROJECT□

5□ T□E SITE DESIG□ E□GI□EER IS RESPO□SI□LE FOR □SSESSI□G T□E □E□RI□G RESIST□□CE □□LLO□ □□LE □E□RI□G C□P□CIT□□OF T□E SU□GR□DE SOILS □□D T□E DEPT□ OF FOU□D□TIO□ STO□E □ IT□ CO□SIDER□TIO□ FOR T□E R□□GE OF E□PECTED SOIL MOISTURE CO□DITIO□S□

6□ PERIMETER STO□E MUST □E E□TE□DED □ORI□O□T□LL□ TO T□E E□C□V□TIO□ □ □LL FOR □OT□ VERTIC□L □□D SLOPED E□C□V□TIO□ □ □LLS□

7□ O□CE L□□ER □C□IS PL□CED□□□□ SOIL□M□TERI□L C□□ □E PL□CED I□ L□□ER □D□UP TO T□E FI□IS□ED GR□DE□MOST P□VEME□T SU□□□SE SOILS C□□ □E USED TO REPL□CE T□E M□TERI□L RE□UIREME□TS OF L□□ER □C□ OR □D□□T T□E SITE DESIG□ E□GI□EER'S DISCRETIO□□

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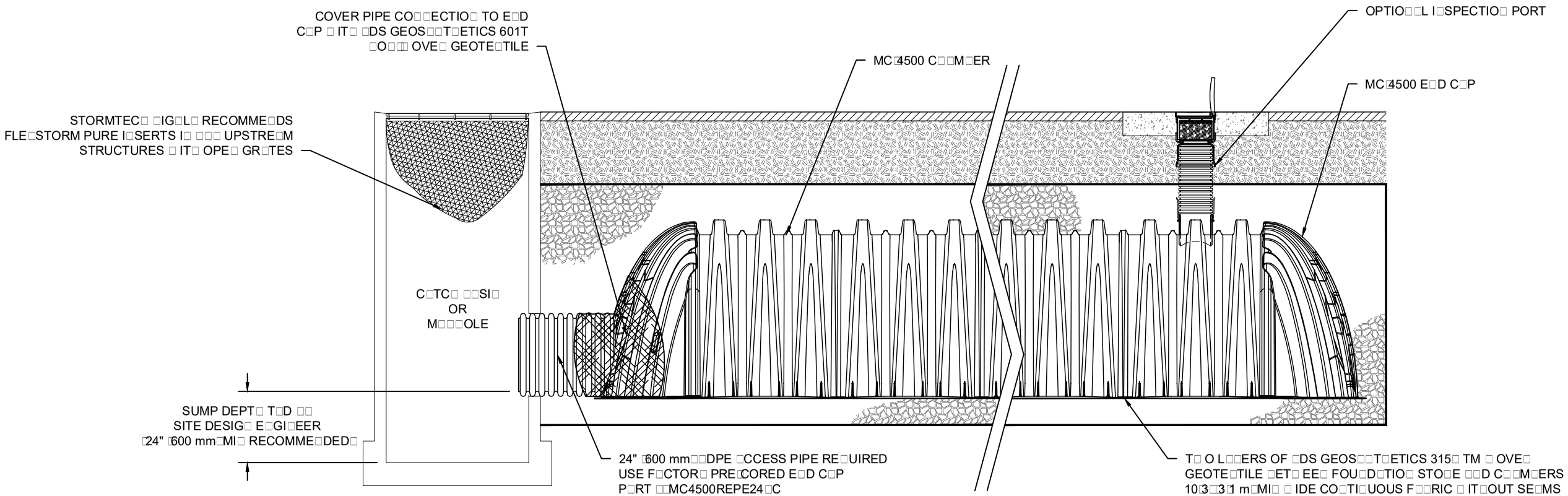

MC-4500 ISOLATOR ROW DETAIL
□TS

INSPECTION & MAINTENANCE

STEP 1□ I□SPECT ISOL□TOR RO□ FOR SEDIME□T
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□□2□ REMOVE □□D CLE□□ FLE□STORM FILTER IF I□ST□LLED
□□3□ USI□G □ FL□S□LIG□T □□D ST□DI□ ROD□ME□SURE DEPT□ OF SEDIME□T □□D RECORD O□ M□I□TE□□□CE LOG
□□4□ LO□ ER □ C□MER□ I□TO ISOL□TOR RO□ FOR VISU□L I□SPECTIO□ OF SEDIME□T LEVELS □OPTIO□□L□
□□5□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□
□□ □LL ISOL□TOR RO□ S
□□1□ REMOVE COVER FROM STRUCTURE □T UPSTRE□M E□D OF ISOL□TOR RO□
□□2□ USI□G □ FL□S□LIG□T□I□SPECT DO□ □ T□E ISOL□TOR RO□ T□ROUG□ OUTLET PIPE
i□ MIRRORS O□ POLES OR C□MER□S M□□ □E USED TO □VOID □ CO□FI□ED SP□CE E□TR□
ii□ FOLLO□ OS□□ REGUL□TIO□S FOR CO□FI□ED SP□CE E□TR□ IF E□TERI□G M□□□OLE
□□3□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□

STEP 2□ CLE□□ OUT ISOL□TOR RO□ USI□G T□E JETV□C PROCESS
□□ □ FI□ED CULVERT CLE□□I□G □O□□LE □ IT□ RE□R F□CI□G SPRE□D OF 45" □11 m□OR MORE IS PREFERRED
□□ □PPL□ MULTIPLE P□SSES OF JETV□C U□TIL □□C□FLUS□ □ □TER IS CLE□□
C□ V□CUUM STRUCTURE SUMP □S RE□UIRED

STEP 3□ REPL□CE □LL COVERS□GR□TES□FILTERS□□□D LIDS□RECORD O□SERV□TIO□S □□D □CTIO□S□

STEP 4□ I□SPECT □□D CLE□□ □□SI□S □□D M□□□OLES UPSTRE□M OF T□E STORMTEC□ S□STEM□

NOTES

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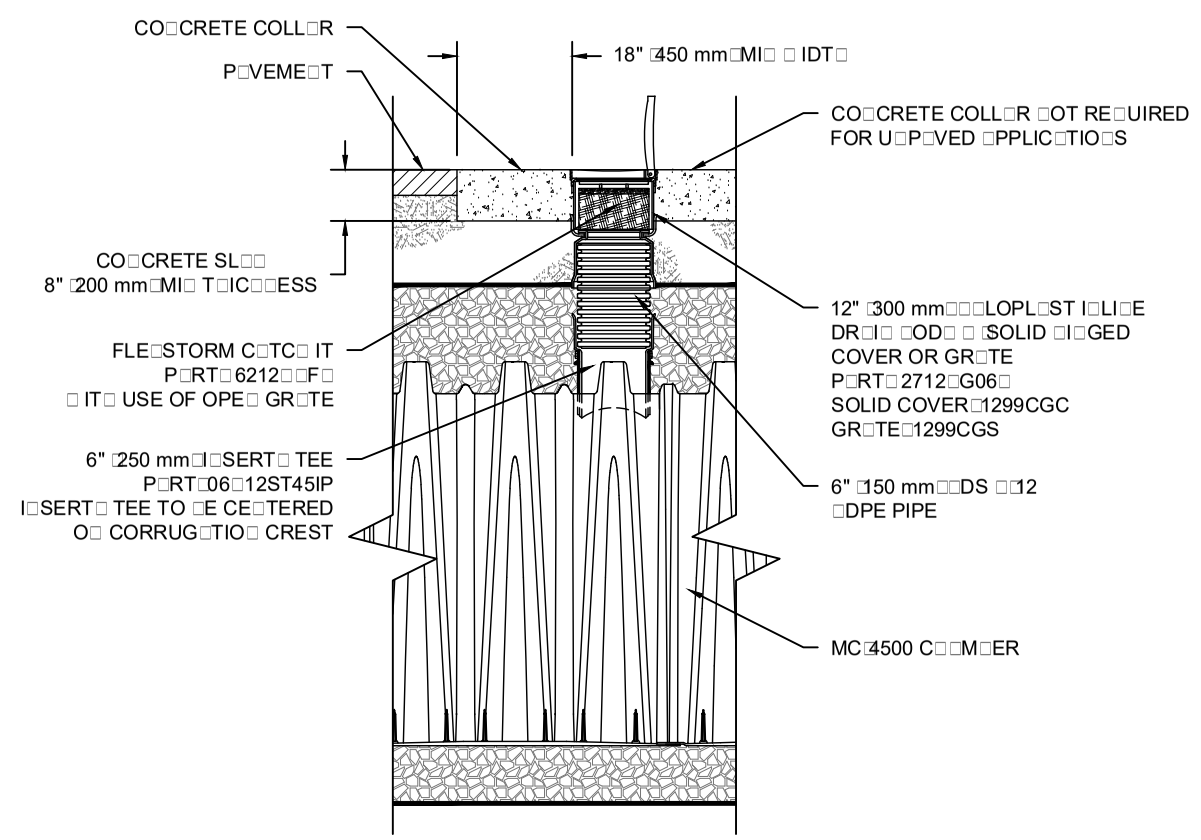

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SHEET
4 OF 6

UNDERDRAIN DETAIL

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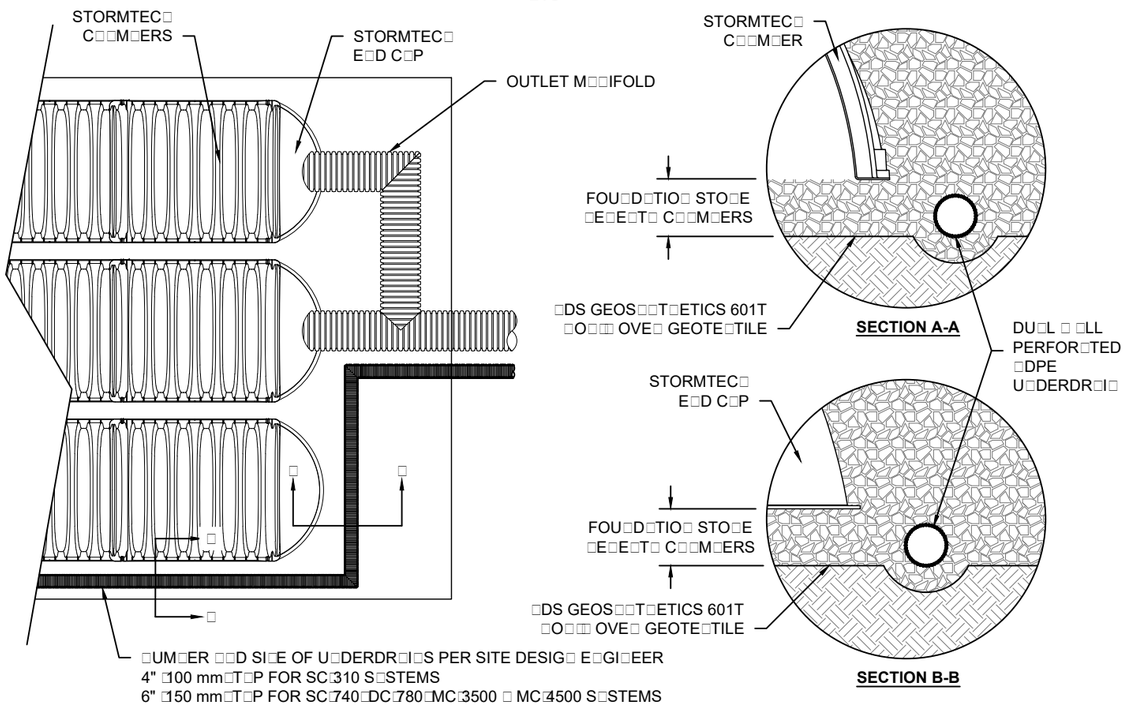

MC-4500 TECHNICAL SPECIFICATION

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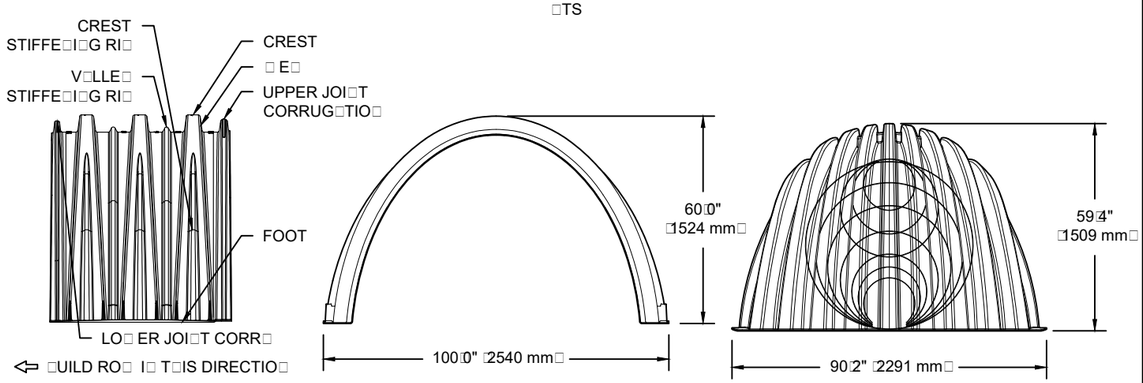

NOMINAL CHAMBER SPECIFICATIONS

SI□E □□ □ □ □ I□ST□LLED LE□GT□□	100□0" □ 60□0" □ 48□3"	□2540 mm □ 1524 mm □ 1227 mm□
C□□M□ER STOR□GE	106□5 CU□IC FEET	(3.01 m³)
MI□IMUM I□ST□LLED STOR□GE□	162□6 CU□IC FEET	(4.60 m³)
□ EIG□T	130□0 I□s□	□59□0 □g□

NOMINAL END CAP SPECIFICATIONS

SI□E □□ □ □ □ I□ST□LLED LE□GT□□	90□2" □ 59□4" □ 30□7"	□2291 mm □ 1509 mm □ 781 mm□
E□D C□P STOR□GE	35□7 CU□IC FEET	(1.01 m³)
MI□IMUM I□ST□LLED STOR□GE□	108□7 CU□IC FEET	(3.08 m³)
□ EIG□T	135□0 I□s□	□61□2 □g□

□□SSUMES 12" □305 mm□STO□E □□OVE□9" □229 mm□STO□E FOU□D□TIO□ □□D □ET□ EE□ C□□M□ERS□
12" □305 mm□STO□E PERIMETER I□ FRO□T OF E□D C□PS □□D 40□ STO□E POROSIT□□

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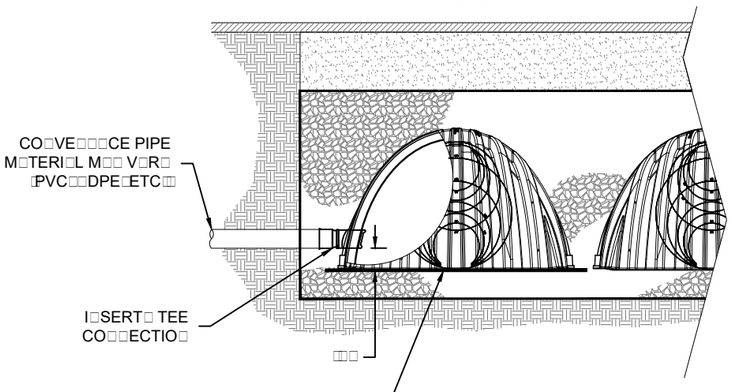
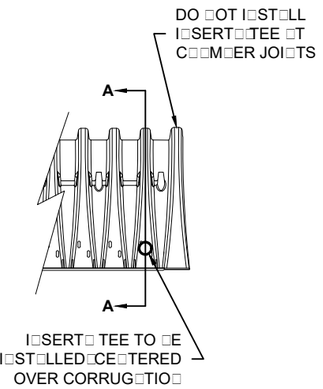


SECTION A-A



SIDE VIEW

NOTE:
P□RT □UM□ERS □ ILL V□R□ □□SED O□ I□LET PIPE M□TERI□LS□
CO□T□CT STORMTEC□ FOR MORE I□FORM□TIO□□

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC□310	6" □150 mm□	4" □100 mm□
SC□740	10" □250 mm□	4" □100 mm□
DC□780	10" □250 mm□	4" □100 mm□
MC□3500	12" □300 mm□	6" □150 mm□
MC□4500	12" □300 mm□	8" □200 mm□
I□SERT□ TEE FITTI□GS □V□IL□□LE FOR SDR 26□SDR 35□SC□ 40 IPS G□S□ETED □ SOLVE□T □ ELD□□12□□P STORM□C□900 OR DUCTILE IRO□		

STU□S □T □OTTOM OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "□"
STU□S □T TOP OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "T"

PART #	STUB	B	C
MC4500REPE06T	6" □150 mm□	42□54" □1□081 m□	□□□
MC4500REPE06□		□□□	0□86" □22 mm□
MC4500REPE08T	8" □200 mm□	40□50" □1□029 m□	□□□
MC4500REPE08□		□□□	1□01" □26 mm□
MC4500REPE10T	10" □250 mm□	38□37" □975 mm□	□□□
MC4500REPE10□		□□□	1□33" □34 mm□
MC4500REPE12T	12" □300 mm□	35□69" □907 mm□	□□□
MC4500REPE12□		□□□	1□55" □39 mm□
MC4500REPE15T	15" □375 mm□	32□72" □831 mm□	□□□
MC4500REPE15□		□□□	1□70" □43 mm□
MC4500REPE18TC	18" □450 mm□	29□36" □746 mm□	□□□
MC4500REPE18□C		□□□	1□97" □50 mm□
MC4500REPE24TC	24" □600 mm□	23□05" □585 mm□	□□□
MC4500REPE24□C		□□□	2□26" □57 mm□
MC4500REPE30□C	30" □750 mm□	□□□	2□95" □75 mm□
MC4500REPE36□C	36" □900 mm□	□□□	3□25" □83 mm□
MC4500REPE42□C	42" □1050 mm□	□□□	3□55" □90 mm□

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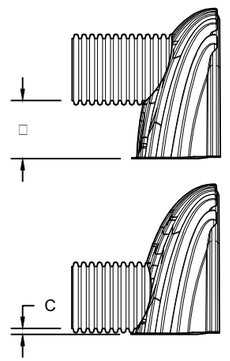
CUSTOM PRECORED I□VERTS □RE □V□IL□□LE UPO□ RE□UEST□I□VE□TORIED M□□IFOLDS I□CLUDE 12□24" □300□600 mm□SI□E O□ SI□E □□D 15□48" □375□1200 mm□ECCE□TRIC M□□IFOLDS□
CUSTOM I□VERT LOC□TIO□S O□ T□E MC□4500 E□D C□P CUT I□ T□E FIELD □RE □OT RECOMME□DED FOR PIPE SI□ES GRE□TER T□□□ 10" □250 mm□
T□E I□VERT LOC□TIO□ I□ COLUM□ □□□RE T□E □IG□TEST POSSI□LE FOR T□E PIPE SI□E□



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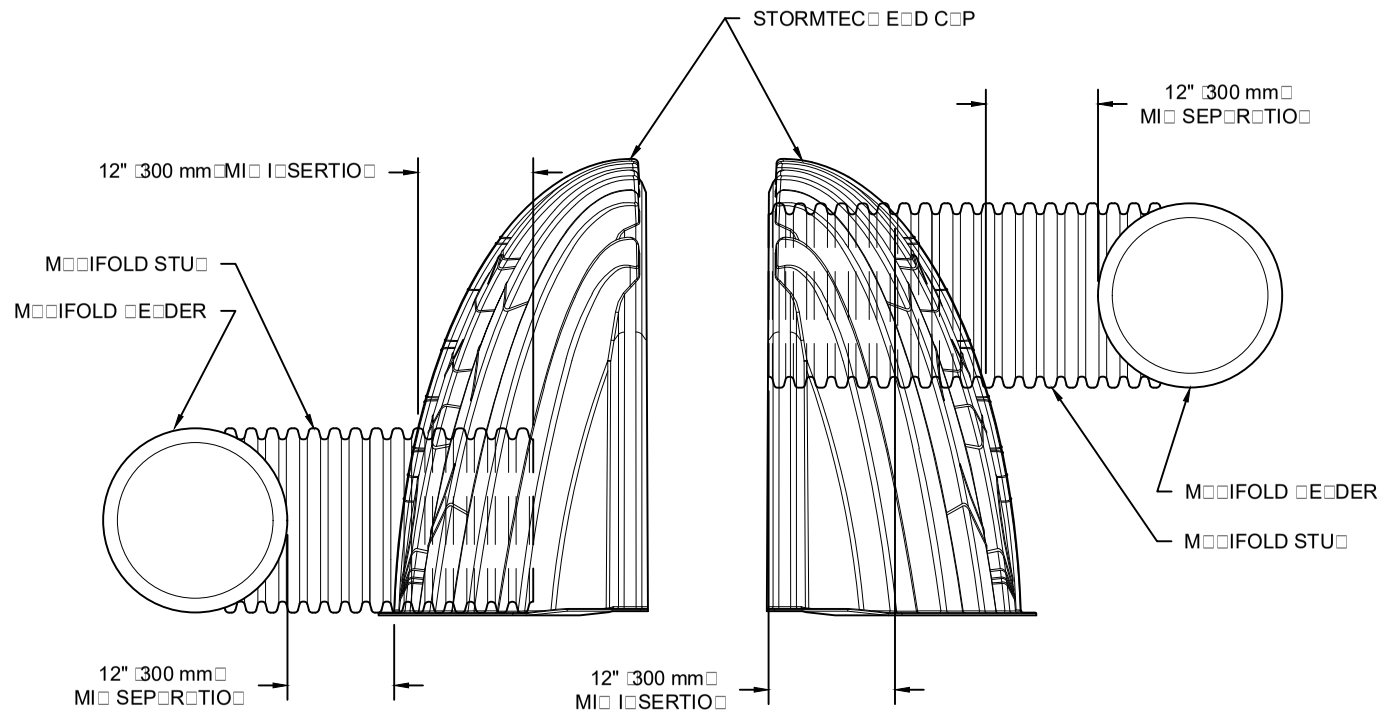

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Appendix 8 Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	**... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE**		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☐ **A. On-site storm drain inlets**	☐ Locations of inlets.	☐ Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	☐ Maintain and periodically repaint or replace inlet markings. ☐ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ☐ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ☐ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
☐ **B. Interior floor drains and elevator shaft sump pumps**		☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ **C. Interior parking garages**		☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **D1.** Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	☐ Provide Integrated Pest Management information to owners, lessees, and operators.
☐ **D2.** Landscape/ Outdoor Pesticide Use	☐ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☐ Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)	State that final landscape plans will accomplish all of the following. ☐ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ☐ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated ☐ soil conditions. Consider using pest-resistant ☐ plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	☐ Maintain landscaping using minimum or no pesticides. ☐ See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/Error! Hyperlink reference not valid. Provide IPM information to new ☐ owners, lessees and operators.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **E.** Pools, spas, ponds, decorative fountains, and other water features.	☐ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☐ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ **F.** Food service	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	☐ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.
☐ **G.** Refuse areas	☐ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ☐ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ☐ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	☐ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☐ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☐ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **H.** Industrial processes.	☐ Show process area.	☐ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	☐ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☑ **I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	☑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ☑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ☑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	☑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

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☐ **J. Vehicle and Equipment Cleaning**	☐ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	☐ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ☐ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ☐**Car dealerships and similar may rinse cars with water only.**

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❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary *containment areas.* ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

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☐ L. Fuel Dispensing Areas	☐ Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ☐ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

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☐ M. Loading Docks	☐ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ☐ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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☑ **N.** Fire Sprinkler Test Water		☑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☐ Condensate drain lines ☐ Rooftop equipment ☐ Drainage sumps ☑ Roofing, gutters, and trim. ☐ Other sources		☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ☐ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ☑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.	

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☐ **P.** Plazas, sidewalks, and parking lots.			☑ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9 O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

APPPENDIX 10 Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Vegetated Swale TC-30

Design Considerations

- Tributary Area
- Area Required
- Slope
- Water Availability

Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	●
☑	Metals	▲
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

California Experience

Caltrans constructed and monitored six vegetated swales in southern California. These swales were generally effective in reducing the volume and mass of pollutants in runoff. Even in the areas where the annual rainfall was only about 10 inches/yr, the vegetation did not require additional irrigation. One factor that strongly affected performance was the presence of large numbers of gophers at most of the sites. The gophers created earthen mounds, destroyed vegetation, and generally reduced the effectiveness of the controls for TSS reduction.

Advantages

- If properly designed, vegetated, and operated, swales can serve as an aesthetic, potentially inexpensive urban development or roadway drainage conveyance measure with significant collateral water quality benefits.

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- Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible.

Limitations

- Can be difficult to avoid channelization.
- May not be appropriate for industrial sites or locations where spills may occur
- Grassed swales cannot treat a very large drainage area. Large areas may be divided and treated using multiple swales.
- A thick vegetative cover is needed for these practices to function properly.
- They are impractical in areas with steep topography.
- They are not effective and may even erode when flow velocities are high, if the grass cover is not properly maintained.
- In some places, their use is restricted by law: many local municipalities require curb and gutter systems in residential areas.
- Swales are mores susceptible to failure if not properly maintained than other treatment BMPs.

Design and Sizing Guidelines

- Flow rate based design determined by local requirements or sized so that 85% of the annual runoff volume is discharged at less than the design rainfall intensity.
- Swale should be designed so that the water level does not exceed 2/3rds the height of the grass or 4 inches, which ever is less, at the design treatment rate.
- Longitudinal slopes should not exceed 2.5%
- Trapezoidal channels are normally recommended but other configurations, such as parabolic, can also provide substantial water quality improvement and may be easier to mow than designs with sharp breaks in slope.
- Swales constructed in cut are preferred, or in fill areas that are far enough from an adjacent slope to minimize the potential for gopher damage. Do not use side slopes constructed of fill, which are prone to structural damage by gophers and other burrowing animals.
- A diverse selection of low growing, plants that thrive under the specific site, climatic, and watering conditions should be specified. Vegetation whose growing season corresponds to the wet season are preferred. Drought tolerant vegetation should be considered especially for swales that are not part of a regularly irrigated landscaped area.
- The width of the swale should be determined using Manning's Equation using a value of 0.25 for Manning's n.

Construction/Inspection Considerations

- Include directions in the specifications for use of appropriate fertilizer and soil amendments based on soil properties determined through testing and compared to the needs of the vegetation requirements.
- Install swales at the time of the year when there is a reasonable chance of successful establishment without irrigation; however, it is recognized that rainfall in a given year may not be sufficient and temporary irrigation may be used.
- If sod tiles must be used, they should be placed so that there are no gaps between the tiles; stagger the ends of the tiles to prevent the formation of channels along the swale or strip.
- Use a roller on the sod to ensure that no air pockets form between the sod and the soil.
- Where seeds are used, erosion controls will be necessary to protect seeds for at least 75 days after the first rainfall of the season.

Performance

The literature suggests that vegetated swales represent a practical and potentially effective technique for controlling urban runoff quality. While limited quantitative performance data exists for vegetated swales, it is known that check dams, slight slopes, permeable soils, dense grass cover, increased contact time, and small storm events all contribute to successful pollutant removal by the swale system. Factors decreasing the effectiveness of swales include compacted soils, short runoff contact time, large storm events, frozen ground, short grass heights, steep slopes, and high runoff velocities and discharge rates.

Conventional vegetated swale designs have achieved mixed results in removing particulate pollutants. A study performed by the Nationwide Urban Runoff Program (NURP) monitored three grass swales in the Washington, D.C., area and found no significant improvement in urban runoff quality for the pollutants analyzed. However, the weak performance of these swales was attributed to the high flow velocities in the swales, soil compaction, steep slopes, and short grass height.

Another project in Durham, NC, monitored the performance of a carefully designed artificial swale that received runoff from a commercial parking lot. The project tracked 11 storms and concluded that particulate concentrations of heavy metals (Cu, Pb, Zn, and Cd) were reduced by approximately 50 percent. However, the swale proved largely ineffective for removing soluble nutrients.

The effectiveness of vegetated swales can be enhanced by adding check dams at approximately 17 meter (50 foot) increments along their length (See Figure 1). These dams maximize the retention time within the swale, decrease flow velocities, and promote particulate settling. Finally, the incorporation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.

Only 9 studies have been conducted on all grassed channels designed for water quality (Table 1). The data suggest relatively high removal rates for some pollutants, but negative removals for some bacteria, and fair performance for phosphorus.

Table 1 Grassed swale pollutant removal efficiency data							
	Removal Efficiencies (% Removal)						
Study	TSS	TP	TN	NO_3	Metals	Bacteria	Type
Caltrans 2002	77	8	67	66	83-90	-33	dry swales
Goldberg 1993	67.8	4.5	-	31.4	42–62	-100	grassed channel
Seattle Metro and Washington Department of Ecology 1992	60	45	-	-25	2–16	-25	grassed channel
Seattle Metro and Washington Department of Ecology, 1992	83	29	-	-25	46–73	-25	grassed channel
Wang et al., 1981	80	-	-	-	70–80	-	dry swale
Dorman et al., 1989	98	18	-	45	37–81	-	dry swale
Harper, 1988	87	83	84	80	88–90	-	dry swale
Kercher et al., 1983	99	99	99	99	99	-	dry swale
Harper, 1988.	81	17	40	52	37–69	-	wet swale
Koon, 1995	67	39	-	9	-35 to 6	-	wet swale

While it is difficult to distinguish between different designs based on the small amount of available data, grassed channels generally have poorer removal rates than wet and dry swales, although some swales appear to export soluble phosphorus (Harper, 1988; Koon, 1995). It is not clear why swales export bacteria. One explanation is that bacteria thrive in the warm swale soils.

Siting Criteria

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system (Schueler et al., 1992). In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5 %. Use of natural topographic lows is encouraged and natural drainage courses should be regarded as significant local resources to be kept in use (Young et al., 1996).

Selection Criteria (NCTCOG, 1993)

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods, but may be necessary only to prevent the vegetation from dying.

The topography of the site should permit the design of a channel with appropriate slope and cross-sectional area. Site topography may also dictate a need for additional structural controls. Recommendations for longitudinal slopes range between 2 and 6 percent. Flatter slopes can be used, if sufficient to provide adequate conveyance. Steep slopes increase flow velocity, decrease detention time, and may require energy dissipating and grade check. Steep slopes also can be managed using a series of check dams to terrace the swale and reduce the slope to within acceptable limits. The use of check dams with swales also promotes infiltration.

Additional Design Guidelines

Most of the design guidelines adopted for swale design specify a minimum hydraulic residence time of 9 minutes. This criterion is based on the results of a single study conducted in Seattle, Washington (Seattle Metro and Washington Department of Ecology, 1992), and is not well supported. Analysis of the data collected in that study indicates that pollutant removal at a residence time of 5 minutes was not significantly different, although there is more variability in that data. Therefore, additional research in the design criteria for swales is needed. Substantial pollutant removal has also been observed for vegetated controls designed solely for conveyance (Barrett et al, 1998); consequently, some flexibility in the design is warranted.

Many design guidelines recommend that grass be frequently mowed to maintain dense coverage near the ground surface. Recent research (Colwell et al., 2000) has shown mowing frequency or grass height has little or no effect on pollutant removal.

Summary of Design Recommendations

1) The swale should have a length that provides a minimum hydraulic residence time of at least 10 minutes. The maximum bottom width should not exceed 10 feet unless a dividing berm is provided. The depth of flow should not exceed 2/3rds the height of the grass at the peak of the water quality design storm intensity. The channel slope should not exceed 2.5%.

2) A design grass height of 6 inches is recommended.

3) Regardless of the recommended detention time, the swale should be not less than 100 feet in length.

4) The width of the swale should be determined using Manning's Equation, at the peak of the design storm, using a Manning's n of 0.25.

5) The swale can be sized as both a treatment facility for the design storm and as a conveyance system to pass the peak hydraulic flows of the 100-year storm if it is located "on-line." The side slopes should be no steeper than 3:1 (H:V).

6) Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible. If flow is to be introduced through curb cuts, place pavement slightly above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

7) Swales must be vegetated in order to provide adequate treatment of runoff. It is important to maximize water contact with vegetation and the soil surface. For general purposes, select fine, close-growing, water-resistant grasses. If possible, divert runoff (other than necessary irrigation) during the period of vegetation

establishment. Where runoff diversion is not possible, cover graded and seeded areas with suitable erosion control materials.

Maintenance

The useful life of a vegetated swale system is directly proportional to its maintenance frequency. If properly designed and regularly maintained, vegetated swales can last indefinitely. The maintenance objectives for vegetated swale systems include keeping up the hydraulic and removal efficiency of the channel and maintaining a dense, healthy grass cover.

Maintenance activities should include periodic mowing (with grass never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages. Cuttings should be removed from the channel and disposed in a local composting facility. Accumulated sediment should also be removed manually to avoid concentrated flows in the swale. The application of fertilizers and pesticides should be minimal.

Another aspect of a good maintenance plan is repairing damaged areas within a channel. For example, if the channel develops ruts or holes, it should be repaired utilizing a suitable soil that is properly tamped and seeded. The grass cover should be thick; if it is not, reseed as necessary. Any standing water removed during the maintenance operation must be disposed to a sanitary sewer at an approved discharge location. Residuals (e.g., silt, grass cuttings) must be disposed in accordance with local or State requirements. Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover. Typical maintenance activities are summarized below:

- Inspect swales at least twice annually for erosion, damage to vegetation, and sediment and debris accumulation preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the swale is ready for winter. However, additional inspection after periods of heavy runoff is desirable. The swale should be checked for debris and litter, and areas of sediment accumulation.

- Grass height and mowing frequency may not have a large impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

- Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

- Sediment accumulating near culverts and in channels should be removed when it builds up to 75 mm (3 in.) at any spot, or covers vegetation.

- Regularly inspect swales for pools of standing water. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g. debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained.

Cost

Construction Cost

Little data is available to estimate the difference in cost between various swale designs. One study (SWRPC, 1991) estimated the construction cost of grassed channels at approximately $0.25 per ft². This price does not include design costs or contingencies. Brown and Schueler (1997) estimate these costs at approximately 32 percent of construction costs for most stormwater management practices. For swales, however, these costs would probably be significantly higher since the construction costs are so low compared with other practices. A more realistic estimate would be a total cost of approximately $0.50 per ft², which compares favorably with other stormwater management practices.

Table 2 Swale Cost Estimate (SEWRPC, 1991)

Component	Unit	Extent	Unit Cost			Total Cost		
			Low	Moderate	High	Low	Moderate	High
Mobilization / Demobilization-Light	Swale	1	$107	$274	$441	$107	$274	$441
Site Preparation								
Clearing[b]	Acre	0.5	$2,200	$3,800	$5,400	$1,100	$1,900	$2,700
Grubbing[c]	Acre	0.25	$3,800	$5,200	$6,600	$950	$1,300	$1,650
General Excavation[d]	Yd^3	372	$2.10	$3.70	$5.30	$781	$1,376	$1,972
Level and Till[e]	Yd^2	1,210	$0.20	$0.35	$0.50	$242	$424	$605
Sites Development								
Salvaged Topsoil Seed, and Mulch[f]	Yd^2	1,210	$0.40	$1.00	$1.60	$484	$1,210	$1,936
Sod[g]	Yd^2	1,210	$1.20	$2.40	$3.60	$1,452	$2,904	$4,356
Subtotal	--	–	--	–	--	$5,116	$9,388	$13,660
Contingencies	Swale	1	25%	25%	25%	$1,279	$2,347	$3,415
Total	--	–	--	–	--	$6,395	$11,735	$17,075

Source: (SEWRPC, 1991)

Note: Mobilization/demobilization refers to the organization and planning involved in establishing a vegetative swale.

[a] Swale has a bottom width of 1.0 foot, a top width of 10 feet with 1:3 side slopes, and a 1,000-foot length.

[b] Area cleared = (top width + 10 feet) x swale length.

[c] Area grubbed = (top width x swale length).

[d] Volume excavated = (0.67 x top width x swale depth) x swale length (parabolic cross-section).

[e] Area tilled = $\left(\text{top width} + \frac{8(\text{swale depth}^2)}{3(\text{top width})}\right) \times$ swale length (parabolic cross-section).

[f] Area seeded = area cleared x 0.5.

[g] Area sodded = area cleared x 0.5.

Table 3 Estimated Maintenance Costs (SEWRPC, 1991)

Component	Unit Cost	Swale Size (Depth and Top Width)		Comment
		1.5 Foot Depth, One-Foot Bottom Width, 10-Foot Top Width	3-Foot Depth, 3-Foot Bottom Width, 21-Foot Top Width	
Lawn Mowing	\$0.85 / 1,000 ft^2 / mowing	\$0.14 / linear foot	\$0.21 / linear foot	Lawn maintenance area=(top width + 10 feet) x length. Mow eight times per year
General Lawn Care	\$9.00 / 1,000 ft^2 / year	\$0.18 / linear foot	\$0.28 / linear foot	Lawn maintenance area = (top width + 10 feet) x length
Swale Debris and Litter Removal	\$0.10 / linear foot / year	\$0.10 / linear foot	\$0.10 / linear foot	–
Grass Reseeding with Mulch and Fertilizer	\$0.30 / yd^2	\$0.01 / linear foot	\$0.01 / linear foot	Area revegetated equals 1% of lawn maintenance area per year
Program Administration and Swale Inspection	\$0.15 / linear foot / year, plus \$25 / inspection	\$0.15 / linear foot	\$0.15 / linear foot	Inspect four times per year
Total	--	**\$0.58 / linear foot**	**\$ 0.75 / linear foot**	--

Maintenance Cost

Caltrans (2002) estimated the expected annual maintenance cost for a swale with a tributary area of approximately 2 ha at approximately $2,700. Since almost all maintenance consists of mowing, the cost is fundamentally a function of the mowing frequency. Unit costs developed by SEWRPC are shown in Table 3. In many cases vegetated channels would be used to convey runoff and would require periodic mowing as well, so there may be little additional cost for the water quality component. Since essentially all the activities are related to vegetation management, no special training is required for maintenance personnel.

References and Sources of Additional Information

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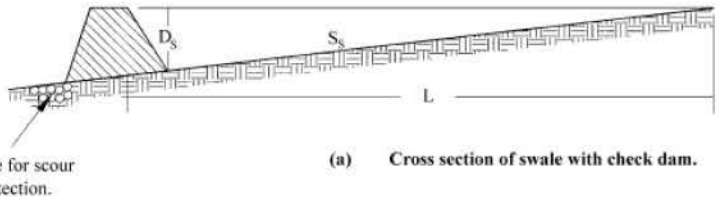
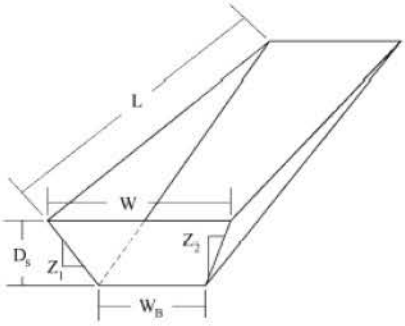


(a) Cross section of swale with check dam.



(b) Dimensional view of swale impoundment area.

Notation:
L = Length of swale impoundment area per check dam (ft)
D_S = Depth of check dam (ft)
S_S = Bottom slpe of swale (ft/ft)
W = Top width of check dam (ft)
W_B = Bottom width of check dam (ft)
$Z_{1\&2}$ = Ratio of horizontal to vertical change in swale side slope (ft/ft)

Bioretention TC-32

Design Considerations

- Soil for Infiltration
- Tributary Area
- Slope
- Aesthetics
- Environmental Side-effects

Description

The bioretention best management practice (BMP) functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through buffer strip and subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend ***(Removal Effectiveness)***

- ● Low
- ▲ Medium
- ■ High

California Experience

None documented. Bioretention has been used as a stormwater BMP since 1992. In addition to Prince George's County, MD and Alexandria, VA, bioretention has been used successfully at urban and suburban areas in Montgomery County, MD; Baltimore County, MD; Chesterfield County, VA; Prince William County, VA; Smith Mountain Lake State Park, VA; and Cary, NC.

Advantages

- Bioretention provides stormwater treatment that enhances the quality of downstream water bodies by temporarily storing runoff in the BMP and releasing it over a period of four days to the receiving water (EPA, 1999).
- The vegetation provides shade and wind breaks, absorbs noise, and improves an area's landscape.

Limitations

- The bioretention BMP is not recommended for areas with slopes greater than 20% or where mature tree removal would

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be required since clogging may result, particularly if the BMP receives runoff with high sediment loads (EPA, 1999).

- Bioretention is not a suitable BMP at locations where the water table is within 6 feet of the ground surface and where the surrounding soil stratum is unstable.
- By design, bioretention BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water.
- In cold climates the soil may freeze, preventing runoff from infiltrating into the planting soil.

Design and Sizing Guidelines

- The bioretention area should be sized to capture the design storm runoff.
- In areas where the native soil permeability is less than 0.5 in/hr an underdrain should be provided.
- Recommended minimum dimensions are 15 feet by 40 feet, although the preferred width is 25 feet. Excavated depth should be 4 feet.
- Area should drain completely within 72 hours.
- Approximately 1 tree or shrub per 50 ft^2 of bioretention area should be included.
- Cover area with about 3 inches of mulch.

Construction/Inspection Considerations

Bioretention area should not be established until contributing watershed is stabilized.

Performance

Bioretention removes stormwater pollutants through physical and biological processes, including adsorption, filtration, plant uptake, microbial activity, decomposition, sedimentation and volatilization (EPA, 1999). Adsorption is the process whereby particulate pollutants attach to soil (e.g., clay) or vegetation surfaces. Adequate contact time between the surface and pollutant must be provided for in the design of the system for this removal process to occur. Thus, the infiltration rate of the soils must not exceed those specified in the design criteria or pollutant removal may decrease. Pollutants removed by adsorption include metals, phosphorus, and hydrocarbons. Filtration occurs as runoff passes through the bioretention area media, such as the sand bed, ground cover, and planting soil.

Common particulates removed from stormwater include particulate organic matter, phosphorus, and suspended solids. Biological processes that occur in wetlands result in pollutant uptake by plants and microorganisms in the soil. Plant growth is sustained by the uptake of nutrients from the soils, with woody plants locking up these nutrients through the seasons. Microbial activity within the soil also contributes to the removal of nitrogen and organic matter. Nitrogen is removed by nitrifying and denitrifying bacteria, while aerobic bacteria are responsible for the decomposition of the organic matter. Microbial processes require oxygen and can result in depleted oxygen levels if the bioretention area is not adequately

aerated. Sedimentation occurs in the swale or ponding area as the velocity slows and solids fall out of suspension.

The removal effectiveness of bioretention has been studied during field and laboratory studies conducted by the University of Maryland (Davis et al, 1998). During these experiments, synthetic stormwater runoff was pumped through several laboratory and field bioretention areas to simulate typical storm events in Prince George's County, MD. Removal rates for heavy metals and nutrients are shown in Table 1.

Table 1 Laboratory and Estimated Bioretention Davis et al. (1998); PGDER (1993)

Pollutant	Removal Rate
Total Phosphorus	70-83%
Metals (Cu, Zn, Pb)	93-98%
TKN	68-80%
Total Suspended Solids	90%
Organics	90%
Bacteria	90%

Results for both the laboratory and field experiments were similar for each of the pollutants analyzed. Doubling or halving the influent pollutant levels had little effect on the effluent pollutants concentrations (Davis et al, 1998).

The microbial activity and plant uptake occurring in the bioretention area will likely result in higher removal rates than those determined for infiltration BMPs.

Siting Criteria

Bioretention BMPs are generally used to treat stormwater from impervious surfaces at commercial, residential, and industrial areas (EPA, 1999). Implementation of bioretention for stormwater management is ideal for median strips, parking lot islands, and swales. Moreover, the runoff in these areas can be designed to either divert directly into the bioretention area or convey into the bioretention area by a curb and gutter collection system.

The best location for bioretention areas is upland from inlets that receive sheet flow from graded areas and at areas that will be excavated (EPA, 1999). In order to maximize treatment effectiveness, the site must be graded in such a way that minimizes erosive conditions as sheet flow is conveyed to the treatment area. Locations where a bioretention area can be readily incorporated into the site plan without further environmental damage are preferred. Furthermore, to effectively minimize sediment loading in the treatment area, bioretention only should be used in stabilized drainage areas.

Additional Design Guidelines

The layout of the bioretention area is determined after site constraints such as location of utilities, underlying soils, existing vegetation, and drainage are considered (EPA, 1999). Sites with loamy sand soils are especially appropriate for bioretention because the excavated soil can be backfilled and used as the planting soil, thus eliminating the cost of importing planting soil.

The use of bioretention may not be feasible given an unstable surrounding soil stratum, soils with clay content greater than 25 percent, a site with slopes greater than 20 percent, and/or a site with mature trees that would be removed during construction of the BMP.

Bioretention can be designed to be off-line or on-line of the existing drainage system (EPA, 1999). The drainage area for a bioretention area should be between 0.1 and 0.4 hectares (0.25 and 1.0 acres). Larger drainage areas may require multiple bioretention areas. Furthermore, the maximum drainage area for a bioretention area is determined by the expected rainfall intensity and runoff rate. Stabilized areas may erode when velocities are greater than 5 feet per second (1.5 meter per second). The designer should determine the potential for erosive conditions at the site.

The size of the bioretention area, which is a function of the drainage area and the runoff generated from the area is sized to capture the water quality volume.

The recommended minimum dimensions of the bioretention area are 15 feet (4.6 meters) wide by 40 feet (12.2 meters) long, where the minimum width allows enough space for a dense, randomly-distributed area of trees and shrubs to become established. Thus replicating a natural forest and creating a microclimate, thereby enabling the bioretention area to tolerate the effects of heat stress, acid rain, runoff pollutants, and insect and disease infestations which landscaped areas in urban settings typically are unable to tolerate. The preferred width is 25 feet (7.6 meters), with a length of twice the width. Essentially, any facilities wider than 20 feet (6.1 meters) should be twice as long as they are wide, which promotes the distribution of flow and decreases the chances of concentrated flow.

In order to provide adequate storage and prevent water from standing for excessive periods of time the ponding depth of the bioretention area should not exceed 6 inches (15 centimeters). Water should not be left to stand for more than 72 hours. A restriction on the type of plants that can be used may be necessary due to some plants' water intolerance. Furthermore, if water is left standing for longer than 72 hours mosquitoes and other insects may start to breed.

The appropriate planting soil should be backfilled into the excavated bioretention area. Planting soils should be sandy loam, loamy sand, or loam texture with a clay content ranging from 10 to 25 percent.

Generally the soil should have infiltration rates greater than 0.5 inches (1.25 centimeters) per hour, which is typical of sandy loams, loamy sands, or loams. The pH of the soil should range between 5.5 and 6.5, where pollutants such as organic nitrogen and phosphorus can be adsorbed by the soil and microbial activity can flourish. Additional requirements for the planting soil include a 1.5 to 3 percent organic content and a maximum 500 ppm concentration of soluble salts.

Soil tests should be performed for every 500 cubic yards (382 cubic meters) of planting soil, with the exception of pH and organic content tests, which are required only once per bioretention area (EPA, 1999). Planting soil should be 4 inches (10.1 centimeters) deeper than the bottom of the largest root ball and 4 feet (1.2 meters) altogether. This depth will provide adequate soil for the plants' root systems to become established, prevent plant damage due to severe wind, and provide adequate moisture capacity. Most sites will require excavation in order to obtain the recommended depth.

Planting soil depths of greater than 4 feet (1.2 meters) may require additional construction practices such as shoring measures (EPA, 1999). Planting soil should be placed in 18 inches or greater lifts and lightly compacted until the desired depth is reached. Since high canopy trees may be destroyed during maintenance the bioretention area should be vegetated to resemble a terrestrial forest community ecosystem that is dominated by understory trees. Three species each of both trees and shrubs are recommended to be planted at a rate of 2500 trees and shrubs per hectare (1000 per acre). For instance, a 15 foot (4.6 meter) by 40 foot (12.2 meter) bioretention area (600 square feet or 55.75 square meters) would require 14 trees and shrubs. The shrub-to-tree ratio should be 2:1 to 3:1.

Trees and shrubs should be planted when conditions are favorable. Vegetation should be watered at the end of each day for fourteen days following its planting. Plant species tolerant of pollutant loads and varying wet and dry conditions should be used in the bioretention area.

The designer should assess aesthetics, site layout, and maintenance requirements when selecting plant species. Adjacent non-native invasive species should be identified and the designer should take measures, such as providing a soil breach to eliminate the threat of these species invading the bioretention area. Regional landscaping manuals should be consulted to ensure that the planting of the bioretention area meets the landscaping requirements established by the local authorities. The designers should evaluate the best placement of vegetation within the bioretention area. Plants should be placed at irregular intervals to replicate a natural forest. Trees should be placed on the perimeter of the area to provide shade and shelter from the wind. Trees and shrubs can be sheltered from damaging flows if they are placed away from the path of the incoming runoff. In cold climates, species that are more tolerant to cold winds, such as evergreens, should be placed in windier areas of the site.

Following placement of the trees and shrubs, the ground cover and/or mulch should be established. Ground cover such as grasses or legumes can be planted at the beginning of the growing season. Mulch should be placed immediately after trees and shrubs are planted. Two to 3 inches (5 to 7.6 cm) of commercially-available fine shredded hardwood mulch or shredded hardwood chips should be applied to the bioretention area to protect from erosion.

Maintenance

The primary maintenance requirement for bioretention areas is that of inspection and repair or replacement of the treatment area's components. Generally, this involves nothing more than the routine periodic maintenance that is required of any landscaped area. Plants that are appropriate for the site, climatic, and watering conditions should be selected for use in the bioretention cell. Appropriately selected plants will aide in reducing fertilizer, pesticide, water, and overall maintenance requirements. Bioretention system components should blend over time through plant and root growth, organic decomposition, and the development of a natural

soil horizon. These biologic and physical processes over time will lengthen the facility's life span and reduce the need for extensive maintenance.

Routine maintenance should include a biannual health evaluation of the trees and shrubs and subsequent removal of any dead or diseased vegetation (EPA, 1999). Diseased vegetation should be treated as needed using preventative and low-toxic measures to the extent possible. BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water. Routine inspections for areas of standing water within the BMP and corrective measures to restore proper infiltration rates are necessary to prevent creating mosquito and other vector habitat. In addition, bioretention BMPs are susceptible to invasion by aggressive plant species such as cattails, which increase the chances of water standing and subsequent vector production if not routinely maintained.

In order to maintain the treatment area's appearance it may be necessary to prune and weed. Furthermore, mulch replacement is suggested when erosion is evident or when the site begins to look unattractive. Specifically, the entire area may require mulch replacement every two to three years, although spot mulching may be sufficient when there are random void areas. Mulch replacement should be done prior to the start of the wet season.

New Jersey's Department of Environmental Protection states in their bioretention systems standards that accumulated sediment and debris removal (especially at the inflow point) will normally be the primary maintenance function. Other potential tasks include replacement of dead vegetation, soil pH regulation, erosion repair at inflow points, mulch replenishment, unclogging the underdrain, and repairing overflow structures. There is also the possibility that the cation exchange capacity of the soils in the cell will be significantly reduced over time. Depending on pollutant loads, soils may need to be replaced within 5-10 years of construction (LID, 2000).

Cost

Construction Cost

Construction cost estimates for a bioretention area are slightly greater than those for the required landscaping for a new development (EPA, 1999). A general rule of thumb (Coffman, 1999) is that residential bioretention areas average about $3 to $4 per square foot, depending on soil conditions and the density and types of plants used. Commercial, industrial and institutional site costs can range between $10 to $40 per square foot, based on the need for control structures, curbing, storm drains and underdrains.

Retrofitting a site typically costs more, averaging $6,500 per bioretention area. The higher costs are attributed to the demolition of existing concrete, asphalt, and existing structures and the replacement of fill material with planting soil. The costs of retrofitting a commercial site in Maryland, Kettering Development, with 15 bioretention areas were estimated at $111,600.

In any bioretention area design, the cost of plants varies substantially and can account for a significant portion of the expenditures. While these cost estimates are slightly greater than those of typical landscaping treatment (due to the increased number of plantings, additional soil excavation, backfill material, use of underdrains etc.), those landscaping expenses that would be required regardless of the bioretention installation should be subtracted when determining the net cost.

Perhaps of most importance, however, the cost savings compared to the use of traditional structural stormwater conveyance systems makes bioretention areas quite attractive financially. For example, the use of bioretention can decrease the cost required for constructing stormwater conveyance systems at a site. A medical office building in Maryland was able to reduce the amount of storm drain pipe that was needed from 800 to 230 feet - a cost savings of $24,000 (PGDER, 1993). And a new residential development spent a total of approximately $100,000 using bioretention cells on each lot instead of nearly $400,000 for the traditional stormwater ponds that were originally planned (Rappahanock,). Also, in residential areas, stormwater management controls become a part of each property owner's landscape, reducing the public burden to maintain large centralized facilities.

Maintenance Cost

The operation and maintenance costs for a bioretention facility will be comparable to those of typical landscaping required for a site. Costs beyond the normal landscaping fees will include the cost for testing the soils and may include costs for a sand bed and planting soil.

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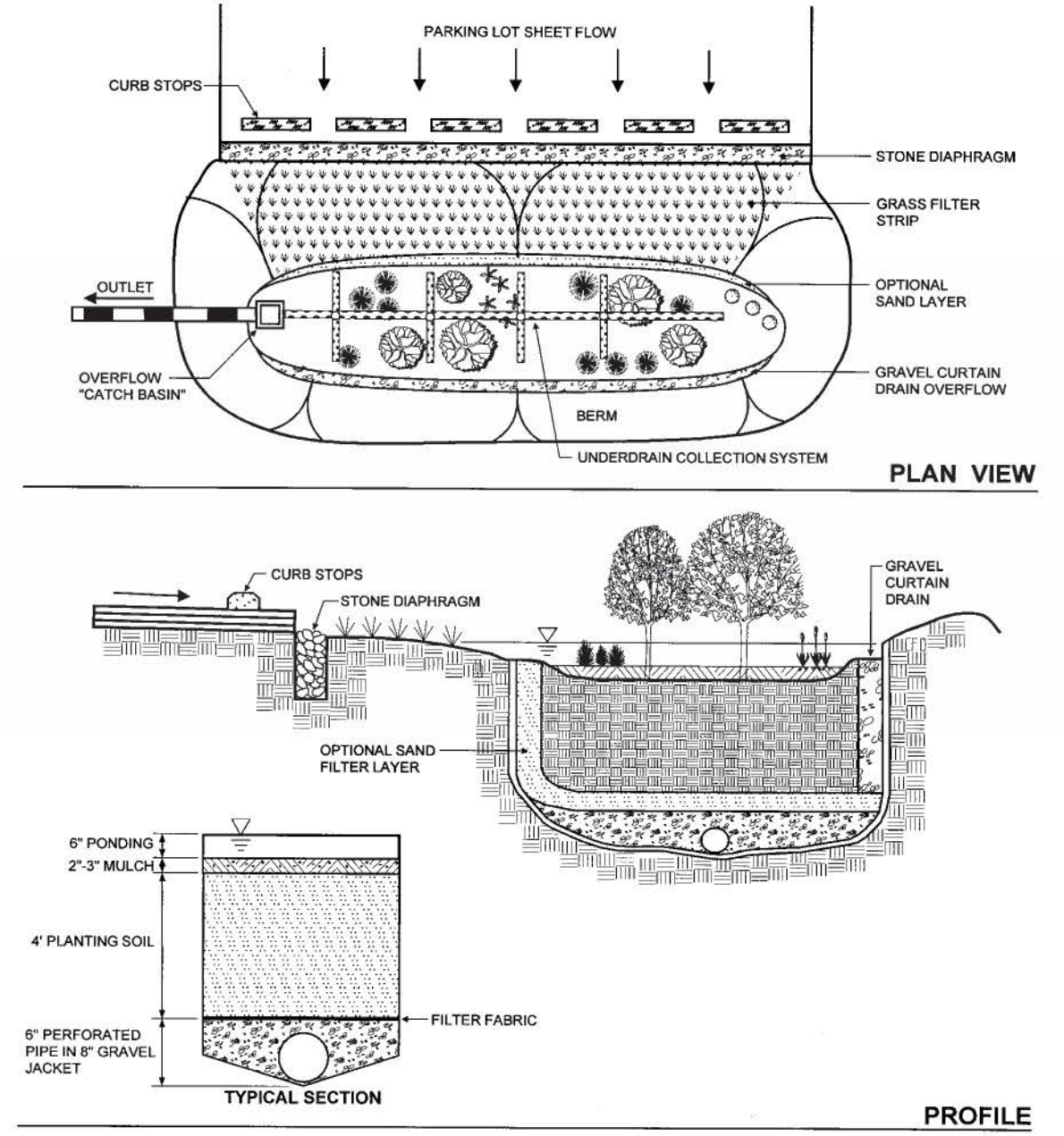

Schematic of a Bioretention Facility (MDE, 2000)

3.3 Permeable Pavement

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evaporation
Maximum Drainage Area	10 acres
Other Names	porous pavement, pervious concrete, pervious asphalt, pervious gravel pavement, cobblestone block, modular block, modular pavement

Description

Permeable pavements can be either pervious asphalt and concrete surfaces, or permeable modular block. Unlike traditional pavements that are impermeable, permeable pavements reduce the volume and peak of stormwater runoff as well as mitigate pollutants from stormwater runoff, provided that the underlying soils can accept infiltration. Permeable pavement surfaces work best when they are designed to be flat or with gentle slopes. This factsheet discusses criteria that apply to infiltration designs.

The permeable surface is placed on top of a reservoir layer that holds the water quality stormwater volume, $V_{BMP.}$ The water infiltrates from the reservoir layer into the native subsoil. Tests must be performed according to the Infiltration Testing Section in Appendix A to be able to use this design procedure.

In some circumstances, permeable pavement may be implemented on a project as a source control feature. Where implemented as a source control feature (sometimes referred to as a 'self-retaining' area), the pavement is not considered a 'BMP' that would be required to be designed and sized per this manual. Where permeable pavement receives runoff from adjacent tributary areas, the permeable pavement *may* be considered a BMP that must be sized according to this manual. Consult the Engineering Authority and the WQMP for any applicable requirements for designing and sizing permeable pavement installations.

Siting Considerations

The WQMP applicable to the project location should be consulted, as it may include criteria for determining the applicability of this and other Infiltration-based BMPs to the project.

Permeable pavements can be used in the same manner as concrete or asphalt in low traffic parking lots, playgrounds, walkways, bike trails, and sports courts. Most types of permeable pavement can be designed to meet Americans with Disabilities Act (ADA) requirements. Permeable pavements **should not** be used in the following conditions:

- Downstream of erodible areas
- Downstream of areas with a high likelihood of pollutant spills
- Industrial or high vehicular traffic areas (25,000 or greater average daily traffic)
- Areas where geotechnical concerns, such as soils with low infiltration rates, would preclude the use of this BMP.

Sites with Impermeable Fire Lanes

Oftentimes, Fire Departments do not allow alternative pavement types including permeable pavement. They require traditional impermeable surfaces for fire lanes. In this situation, it is acceptable to use an impermeable surface for the fire lane drive aisles and permeable pavement for the remainder of the parking lot.

Where impermeable fire lanes are used in the design, the impermeable surface must slope towards the permeable pavement, and the base layers shall remain continuous underneath the two pavement types, as shown in Figure 1. This continuous reservoir layer helps to maintain infiltration throughout the pervious pavement site, and can still be considered as part of the total required storage area.

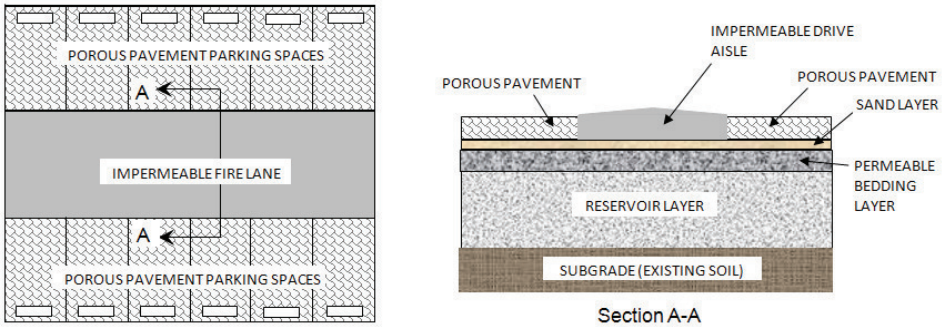

Figure 1: Impermeable Fire Lanes

Also, while a seal coat treatment may be used on the impermeable fire land, traditional seal coat treatments **shall not** be used on permeable pavement.

Setbacks

Always consult your geotechnical engineer for site specific recommendations regarding setbacks for permeable pavement. Recommended setbacks are needed to protect buildings, walls, onsite wells, streams and tanks.

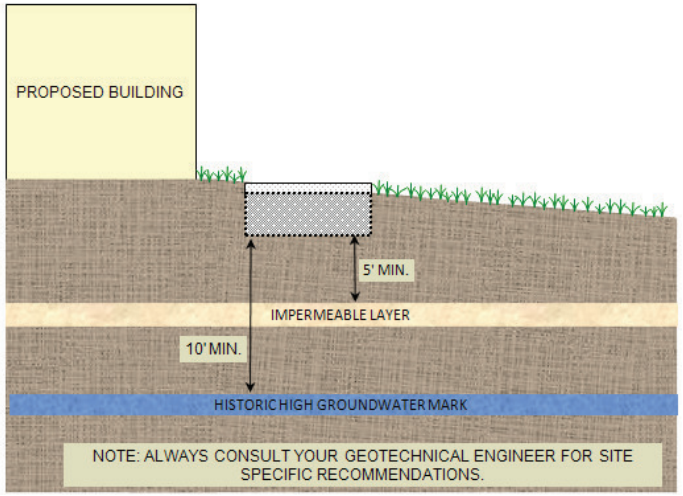

Figure 2: Permeable Pavement Setback Requirements

A minimum vertical separation of 10 feet is required from the bottom of the reservoir layer to the historic high groundwater mark, see Figure 2. A minimum vertical separation of 5 feet is required from the bottom of the reservoir layer to any impermeable layer in the soil. If the historic high groundwater mark is less than 10 feet below the reservoir layer section, or less than 5 feet from an impermeable layer, the infiltration design is not feasible.

Design and Sizing Criteria

To ensure that the pavement structural section is not compromised, a 24-hour drawdown time is utilized for this BMP instead of the longer drawdown time used for most volume based BMPs.

Reservoir Layer Considerations

Even with proper maintenance, sediment will begin to clog the soil below the permeable pavement. Since the soil cannot be scarified or replaced, this will result in slower infiltration rates over the life of the permeable pavement. Therefore, the reservoir layer is limited to a maximum of 12 inches in depth to ensure that over the life of the BMP, the reservoir layer will drain in an adequate time.

***Note**: All permeable pavement BMP installations (not including Permeable Pavement as a source control BMP i.e. a self-retaining area) must be tested by the geotechnical engineer to ensure that the soils drain at a minimum allowable rate to ensure drainage.. See the Infiltration Testing Section of this manual for specific details for the required testing and applied factors of safety.*

Sloping Permeable Pavement

Ideally permeable pavement would be level, however most sites will have a mild slope. If the tributary drainage area is too steep, the water may be flowing too fast when it approaches the permeable pavement, which may cause water to pass over the pavement instead of percolating and entering the reservoir layer. If the maximum slopes shown in Table 1 are complied with, it should address these concerns.

Table 1: Design Parameters for Permeable Pavement

Design Parameter	Permeable Pavement
Maximum slope of permeable pavement	3%
Maximum contributing area slope	5%

Regardless of the slope of the pavement surface design, the bottom of the reservoir layers **shall be flat and level** as shown in Figure 3. The design shown ensures that the water quality volume will be contained in the reservoir layer. A terraced design utilizing non-permeable check dams may be a useful option when the depth of gravel becomes too great as shown in Figure 3.

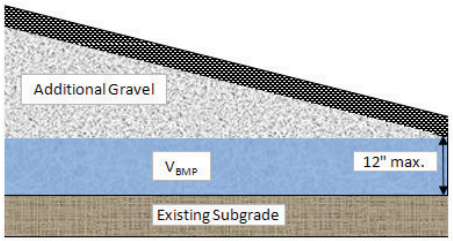

Figure 3: Sloped Cross Sections for Permeable Pavement

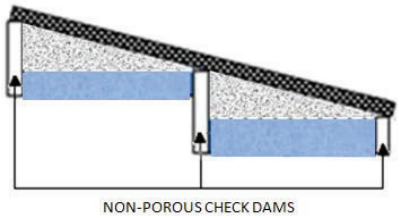

Figure 4: Permeable Pavement with Non-permeable Check Dams

In Figure 4, the bottom of the gravel reservoir layer is incorrectly sloped parallel to the pavement surface. Water would only be allowed to pond up to the lowest point of the BMP. Additional flows would simply discharge from the pavement. Since only a portion of the gravel layer can store water, this design would result in insufficient capacity. This is not acceptable.

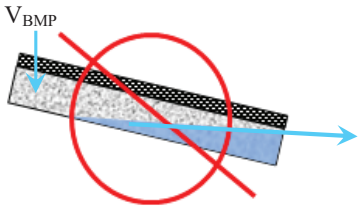

Figure 5: Incorrect Sloping of Permeable Pavement

To assure that the subgrade will empty within the 24 hour drawdown time, it is important that the maximum depth of 12 inches for the reservoir layer discussed in the design procedure is not exceeded. The value should be measured from the lowest elevation of the slope (Figure 4).

Minimum Surface Area

The minimum surface area required, A_S, is calculated by dividing the water quality volume, V_{BMP}, by the depth of water stored in the reservoir layer. The depth of water is found by multiplying the void ratio of the reservoir aggregate by the depth of the layer, b_{TH}. The void ratio of the reservoir aggregate is typically 40%; the maximum reservoir layer depth is 12".

Sediment Control

A pretreatment BMP should be used for sediment control. This pretreatment BMP will reduce the amount of sediment that enters the system and reduce clogging. The pretreatment BMP will also help to spread runoff flows, which allows the system to infiltrate more evenly. The pretreatment BMP must discharge to the surface of the pavement and not the subgrade. Grass swales may also be used as part of a treatment train with permeable pavements.

Liners and Filter Fabric

Always consult your geotechnical engineer for site specific recommendations regarding liners and filter fabrics. Filter fabric may be used around the edges of the permeable pavement; this will help keep fine sediments from entering the system. Unless recommended for the site, impermeable liners are not to be used below the subdrain gravel layer.

Overflow

An overflow route is needed in the permeable pavement design to bypass storm flows larger than the V_{BMP} or in the event of clogging. Overflow systems must connect to an acceptable discharge point such as a downstream conveyance system.

Roof Runoff

Permeable pavement can be used to treat roof runoff. However, the runoff cannot be discharged beneath the surface of the pavement directly into the subgrade, as shown in Figure 6. Instead the pipe should empty on the surface of the permeable pavement as shown in Figure 7. A filter on the drainpipe should be used to help reduce the amount of sediment that enters the permeable pavement.

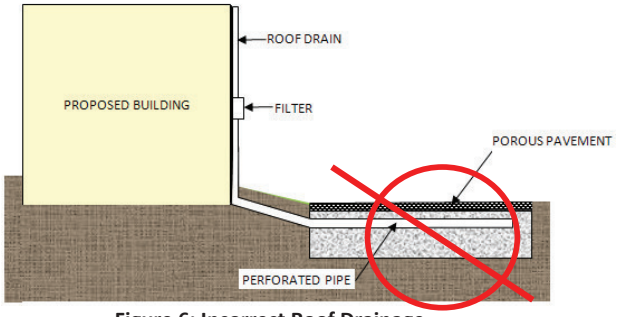

Figure 6: Incorrect Roof Drainage

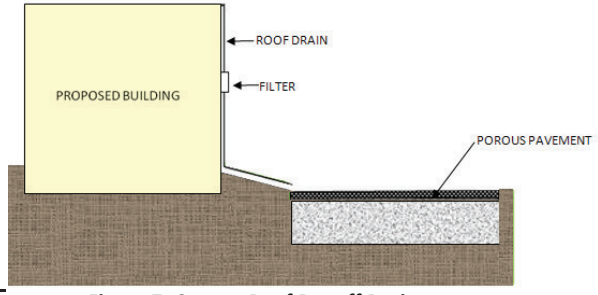

Figure 7: Correct Roof Runoff Drainage

Infiltration

Refer to the Infiltration Testing Section (Appendix A) in this manual for recommendations on testing for this BMP.

Pavement Section

The cross section necessary for infiltration design of permeable pavement includes:

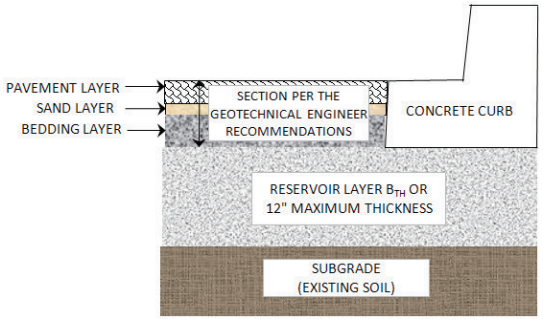

Figure 8: Infiltration Cross Section

- The thickness of the layers of permeable pavement, sand and bedding layers depends on whether it is permeable modular block or pervious pavement. A licensed geotechnical or civil engineer is required to determine the thickness of these upper layers appropriate for the pavement type and expected traffic loads.
- A 12" maximum reservoir layer consisting of AASHTO #57 gravel vibrated in place or equivalent with a minimum of 40% void ratio.

Inspection and Maintenance Schedule –Modular Block

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris
Utility Trenching and other pavement repairs	• Remove and reset modular blocks, structural section and reservoir layer as needed. Replace damaged blocks in-kind. • Do not pave repaired areas with impermeable surfaces.
After storm events	• Inspect areas for ponding
2-3 times per year	• Sweep to reduce the chance of clogging
As needed	• Sand between pavers may need to be replaced if infiltration capacity is lost

Inspection and Maintenance Schedule –Pervious Concrete/Asphalt

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris
Utility Trenching other pavement repairs	• Replace structural section and reservoir layer in kind. • Re-pave using pervious concrete/asphalt. Do not pave repaired areas with impermeable surfaces.
After storm events	• Inspect areas for ponding
2-3 times per year	• Vacuum the permeable pavement to reduce the chance of clogging
As needed	• Remove and replace damaged or destroyed permeable pavement

Design Procedure Permeable Pavement

1. Enter the Tributary Area, A_T.

2. Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

3. Enter the reservoir layer depth, b_{TH} for the proposed permeable pavement. The reservoir layer maximum depth is 12 inches.

4. Calculate the Minimum Surface Area, A_S, required.

$$A_S(\text{ft}) = \frac{V_{BMP}\ (\text{ft}^3)}{(0.4 \times b_{TH}\ (\text{in}))/12(\text{in/ft})}$$

   Where, the porosity of the gravel in the reservoir layer is assumed to be 40%.

5. Enter the proposed surface area and ensure that this is equal to or greater than the minimum surface area required.

6. Enter the dimensions, per the geotechnical engineer's recommendations, for the pavement cross section. The cross section includes a pavement layer, usually a sand layer and a permeable bedding layer. Then add this to the maximum thickness of the reservoir layer to find the total thickness of the BMP.

7. Enter the slope of the top of the permeable pavement. The maximum slope is 3%.

8. Enter whether sediment control was provided.

9. Enter whether the geotechnical approach is attached.

10. Describe the surfaces surrounding the permeable pavement. It is preferred that a vegetation buffer is used around the permeable pavement.
11. Check to ensure that vertical setbacks are met. There should be a minimum of 10 feet between the bottom of the BMP and the top of the high groundwater table, and a minimum of 5 feet between the reservoir layer the top of the impermeable layer.

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Appendix J

Noise Impact Analysis

NOISE IMPACT ANALYSIS
KASSAB TRAVEL CENTER PROJECT
CITY OF LAKE ELSINORE

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PROJECT NO. 17028

DECEMBER 18, 2017

[REVISED OCTOBER 1, 2018]

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
ONAC	Federal Office of Noise Abatement and Control
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
UMTA	Federal Urban Mass Transit Administration

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise impacts associated with the proposed Kassab Travel Center project (proposed project). The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Information regarding the fundamentals of vibration;
- A description of the local noise guidelines and standards;
- An evaluation of the current noise environment;
- An analysis of the potential short-term construction-related noise impacts from the proposed project; and,
- An analysis of long-term operations-related noise impacts from the proposed project.

1.2 Site Location and Study Area

The project site is located in the northern portion of the City of Lake Elsinore (City) on the west corner of Riverside Drive and Collier Avenue at 29301 Riverside Drive. The approximately 2.84-acre project site is located on a vacant parcel that is bounded by commercial uses to the northwest, Collier Avenue and commercial uses to the northeast, Riverside Drive and vacant land to the southeast, and vacant land to the southwest. The project location is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest offsite sensitive receptors to the project site consist of workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet west of the project site. The nearest school to the project site is Temescal Canyon High School that is located as near as 0.5 mile north of the project site.

1.3 Proposed Project Description

The proposed project would consist of the development of an 18-vehicle fueling position gasoline and diesel station with two canopies that total 6,092 square feet, an 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include multiple parking areas with a total of 78-spaces. The proposed site plan is shown in Figure 2.

1.4 Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City of Lake Elsinore and State of California.

City of Lake Elsinore Municipal Code

<u>Section 17.176.080(A) – Maximum Permissible Sound Levels</u>

Section 17.176.060(A) of the Municipal Code limits onsite noise sources to 65 dBA between 7:00 a.m. and 10:00 p.m. and 60 dBA between 10:00 p.m. and 7:00 a.m. at the nearby commercial properties

located as near as 60 feet northwest of the project site. Compliance with this regulation will reduce the operations-related noise impacts to the nearby receptors.

Section 17.176.080(F) – Construction Noise Limits

Section 17.176.080(F)(1) of the City's Municipal Code restricts construction activities from occurring between the weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on weekends or holidays. Section 17.176.080(F)(2) of the City's Municipal Code limits construction noise that occurs at the nearby business uses to 85 dBA from mobile equipment and 75 dBA from stationary equipment and at the nearby single-family homes to 75 dBA for mobile equipment and 60 dBA for stationary equipment. Compliance with this regulation will reduce the construction-related noise impacts to the nearby receptors.

Section 17.176.080(G) – Vibration Limits

Section 17.176.080(G) of the City's Municipal Code restricts the operation of any device that creates a vibration which is above the vibration threshold of any individual at or beyond the property boundary of the source. Compliance with this regulation will reduce the construction-related vibration impacts to the nearby sensitive receptors.

State of California Rules

The following lists the State of California rules that are applicable to all non-residential projects in the State.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

1.5 Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

Expose persons to noise levels in excess of standards?

Potentially significant impact. Implementation of Mitigation Measures 1 and 2 would reduce the impact to less than significant levels.

Expose persons to excessive groundborne vibration?

Less than significant impact.

Result in a substantial permanent increase in ambient noise levels above existing levels without the proposed project?

Potentially significant impact. Implementation of Mitigation Measure 2 would reduce the impact to less than significant levels.

Result in a substantial temporary increase in ambient noise levels above existing levels without the proposed project?

Potentially significant impact. Implementation of Mitigation Measure 1 would reduce the impact to less than significant levels.

Expose persons to excessive noise levels from aircraft?

Less than significant impact.

1.6 Mitigation Measures Required for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.4 above and through implementation of the following mitigation all noise and vibration impacts would be reduced to less than significant levels.

Mitigation Measure 1:

The project applicant shall require any construction contractor that needs to use stationary construction equipment within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and nearest sensitive receptors.

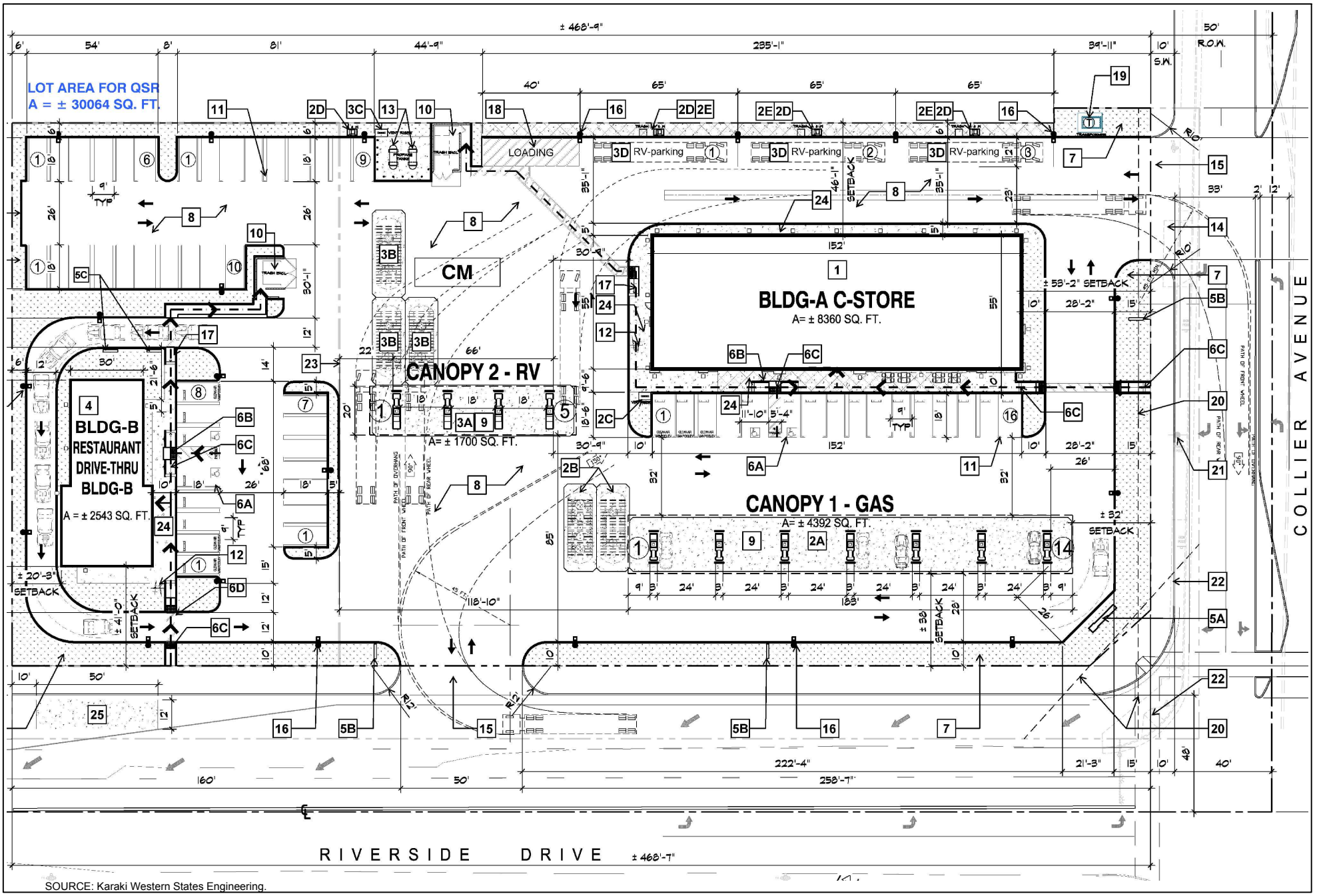
Mitigation Measure 2:

The project applicant shall construct a minimum 8-foot high masonry wall that is free of cutouts or openings along the northwest and southwest property lines of the project site. The portions of the walls that are within the setbacks of Riverside Drive and Collier Avenue shall be limited to 3 feet in height per the wall height limitations detailed in Sections 17.112.070 and 17.112.090 of the City of Lake Elsinore Municipal Code.

SOURCE: Google Earth

VISTA ENVIRONMENTAL

Figure 1
Project Location Map



SOURCE: Karaki Western States Engineering.

VISTA ENVIRONMENTAL

Figure 2
Proposed Site Plan

2.0 NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear.

2.1 Noise Descriptors

Noise Equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour Leq is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Level (Ldn) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn, except that it has another addition of 4.77 decibels to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these time periods because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound appears louder in the evening and nighttime hours and is weighted accordingly. The City of Lake Elsinore relies on the Ldn noise standard to assess transportation-related impacts on noise sensitive land uses.

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a "pure tone," there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to "stand out" against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away

from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis.

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

3.1 Vibration Descriptors

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is "VdB", which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration.

3.3 Vibration Propagation

The propagation of ground-borne vibration is not as simple to model as airborne noise. This is due to the fact that noise in the air travels through a relatively uniform median, while ground-borne vibrations travel through the earth which may contain significant geological differences. There are three main types of vibration propagation; surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 REGULATORY SETTING

The project site is located in the City of Lake Elsinore. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Although the proposed project is not under the jurisdiction of the FTA, the FTA is the only agency that has defined what constitutes a significant noise impact from implementing a project. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings are provided below in Table A.

Table A – FTA Project Effects on Cumulative Noise Exposure

Existing Noise Exposure (dBA Leq or Ldn)	Allowable Noise Impact Exposure dBA Leq or Ldn		
	Project Only	Combined	Noise Exposure Increase
45	51	52	+7
50	53	55	+5
55	55	58	+3
60	57	62	+2
65	60	66	+1
70	64	71	+1
75	65	75	0

Source: Federal Transit Administration, 2006.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Noise Standards

California Department of Health Services Office of Noise Control

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

Caltrans issued the *Transportation- and Construction-Induced Vibration Guidance Manual* in 2004. The manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

4.3 Local Regulations

The City of Lake Elsinore General Plan and Municipal Code establishes the following applicable policies related to noise and vibration.

City of Lake Elsinore General Plan

The following applicable goals and policies to the proposed project are from the Noise Element of the General Plan.

Goal 7 Maintain an environment for all City residents and visitors free of unhealthy, obtrusive, or otherwise excessive noise.

Policies:

7.1 Apply the noise standards set forth in the Lake Elsinore Noise and Land Use Compatibility Matrix (see Table B) and Interior and Exterior Noise Standards (see Table C) when considering all new development and redevelopment proposed within the City.

Table B – City of Lake Elsinore Noise and Land Use Compatibility Matrix

		Day-Night Noise Level (L_{dn})						
Land Use Categories	**Uses**	**<55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**	**>80**
Residential	Single-Family, Duplex, Multiple-Family	A	A	B	B	C	D	D
	Mobile Homes	A	A	B	C	C	D	D
Commercial Regional District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial Regional Village, District Special	Commercial, Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial Industrial Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial Regional Institutional Civic Center	Amphitheatre, Concert Hall, Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial General, Special Industrial Institutional	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional General	Hospital, Church, Library, Schools, Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
	Golf Course, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C

Land Use Categories	Uses	Day-Night Noise Level (L_{dn})						
		<55	55-60	60-65	65-70	70-75	75-80	>80
Agriculture	Agriculture	A	A	A	A	A	A	A

Interpretation:

Zone A: Clearly Compatible. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B: Normally Compatible. New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Zone C: Normally Incompatible. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Zone D: Clearly Incompatible. New construction or development should generally not be undertaken.

Source: City of Lake Elsinore General Plan, 2011.

Table C – City of Lake Elsinore Interior and Exterior Noise Standards

Land Use Categories	Uses	Energy Average L_{dn}	
		Interior[(1)]	Exterior[(2)]
Residential	Single-Family, Duplex, Multiple-Family	45[(3,5)]	60
	Mobile Homes	--	60[(4)]
Commercial, Institutional	Hotel, Motel, Transient Lodging	45[(5)]	--
	Hospital, School's Classroom	45	--
	Church, Library	45	--

Interpretation:
[1] Indoor environment excluding: bathrooms, toilets, closets, corridors.
[2] Outdoor environment limited to: private yard of single-family, multi-family private patio or balcony which is served by a means of exit from inside, Mobile Home Park.
[3] Noise level requirement with closed windows. Mechanical ventilation system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of UBC.
[4] Exterior noise level should be such that interior noise level will not exceed 45 CNEL.
[5] As per California Administrative Code, Title 24, Part 6, Division T25, Chapter 1, Subchapter 1, Article 4, Section T25-28.
Source: City of Lake Elsinore General Plan, 2011.

City of Lake Elsinore Municipal Code

The Lake Elsinore Municipal Code establishes the following applicable standards related to noise.

17.112.090 Gasoline Dispensing Establishments.

The provisions of this section shall apply to all new construction, reconstruction, and addition or conversion of use for service stations and other places where motor vehicle fuels are dispensed to the public.

H. Walls. A decorative masonry wall a minimum of six feet in height shall be constructed and maintained along all interior property lines abutting residential property. Where such walls abut or are adjacent to commercial/office uses they shall be not less than five feet in height. A minimum five-foot planter shall be provided adjacent to the wall. Walls may be waived where the gasoline dispensing facility and

abutting commercial or industrial use share a common driveway. Said wall shall be reduced to 36 inches within required yards adjacent to a public right-of-way.

17.176.060 Exterior Noise Limits.

A. Maximum Permissible Sound Levels by Receiving Land Use.

1. The noise standards for the various categories of land use identified by the Noise Control Office(r) as presented in Table 1 (see Table D) shall, unless otherwise specifically indicated, apply to all such property within a designated zone.

2. No person shall operate, or cause to be operated, any source of sound at any location within the incorporated City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on any other property, either incorporated or unincorporated to exceed:

    a. The noise standard for that land use as specified in Table 1 for a cumulative period of more than 30 minutes in any hour; or

    b. The noise standard plus five dB for a cumulative period of more than 15 minutes in any hour; or

    c. The noise standard plus 10 dB for a cumulative period of more than five minutes in any hour; or

    d. The noise standard plus 15 dB for a cumulative period of more than one minute in any hour; or

    e. The noise standard plus 20 dB or the maximum measured ambient level, for any period of time.

3. If the measured ambient level differs from that permissible within any of the last four noise limit categories above, the allowable noise exposure standard shall be adjusted in five dB increments in each category as appropriate to encompass or reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

4. If the measurement location is on a boundary between two different zones, the noise level limit applicable to the lower noise zone plus six dB shall apply.

Table D – City of Lake Elsinore Exterior Noise Limits

Receiving Land Use Category	Time Period	Noise Level (dBA)
Single-Family Residential	10:00 p.m. – 7:00 a.m.	40
	7:00 a.m. – 10:00 p.m.	50
Multiple Dwelling Residential	10:00 p.m. – 7:00 a.m.	45
	7:00 a.m. – 10:00 p.m.	50
Public Space		
Limited Commercial and Office	10:00 p.m. – 7:00 a.m.	55
	7:00 a.m. – 10:00 p.m.	60
General Commercial	10:00 p.m. – 7:00 a.m.	60
	7:00 a.m. – 10:00 p.m.	65
Light Industrial	Anytime	70
Heavy Industrial	Anytime	75

Source: City of Lake Elsinore Municipal Code Section 17.176.060.

17.176.080 Prohibited acts.

No person shall unnecessarily make, continue, or cause to be made or continued, any noise disturbance. The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:

B. Using or operating for any purpose any loudspeaker, loudspeaker system, or similar device between the hours of 10:00 p.m. and 7:00 a.m., such that the sound therefrom creates a noise disturbance across a residential real property line, or at any time violates the provisions of LEMC 17.176.060(A), except for any noncommercial public speaking, public assembly or other activity for which a variance has been issued by the City.

E. Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to cause a noise disturbance across a residential real property line or at any time to violate the provisions of LEMC

F. Construction/Demolition

1. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on weekends or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the City.

2. Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner the maximum noise levels at affected properties will not exceed those listed in the following schedule: (see Table E for Residential Properties)

Table E – City of Lake Elsinore Construction Noise Standards at Residential Properties

Time Interval	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas Semi-Residential/ Commercial
Mobile Equipment			
Daily, except Sundays and Legal Holidays 7:00 a.m. to 7:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and Legal Holidays	60 dBA	65 dBA	70 dBA
Stationary Equipment			
Daily, except Sundays and Legal Holidays 7:00 a.m. to 7:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and Legal Holidays	50 dBA	55 dBA	60 dBA

Source: City of Lake Elsinore Municipal Code Section 17.176.080.

AT BUSINESS PROPERTIES:

Mobile Equipment

Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment:

Daily, including Sundays and Legal Holidays, all hours: maximum of 85 dBA.

Stationary Equipment

Maximum noise levels for repetitive scheduled and relatively long-term operation of stationary equipment:

Daily, including Sundays and Legal Holidays, all hours: maximum of 75 dBA.

3. All mobile or stationary internal combustion engine powered equipment or machinery shall be equipped with suitable exhaust and air intake silencers in proper working order.

G. Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet (46 meters) from the source if on public space or public right-of-way.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise level environment, noise measurements have been taken in the vicinity of the project site. The field survey noted that noise within the area of the project site is generally characterized by vehicular traffic on Riverside Drive and Collier Avenue. The following describes the measurement procedures, measurement locations, noise measurement results, and the modeling of the existing noise environment.

5.1 Noise Measurement Equipment

The short-term noise measurements were taken using a Larson-Davis Model 831 Type 1 precision sound level meter programmed in "slow" mode to record noise levels in "A" weighted form as well as the frequency spectrum of the noise broken down into 1/3 octaves. The sound level meter and microphone were mounted on a tripod five feet above the ground and were equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The unit meets the requirements of ANSI Standard S1.4-1984 and IEC Standard 942: 1988 for Class 1 equipment. All noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

Noise Measurement Location

The noise monitoring locations were selected in order to obtain noise measurements of the current noise levels in the project study area and to provide a baseline for any potential noise impacts that may be created by development of the proposed project. The noise measurement sites were selected to provide a representative sampling of the noise levels created by nearby noise sources. Descriptions of the noise monitoring sites are provided below in Table F. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 11:34 a.m. and 12:01 p.m. on Tuesday, March 28, 2017. During the noise measurements the sky was clear, the temperature was 72 degrees Fahrenheit, the humidity was 20 percent, barometric pressure was 30 inches of mercury, and the wind was blowing around 12 miles per hour.

All traffic noise measurement durations were measured according to the standards stated in Section N-3320 of Caltrans Technical Noise Supplement (TeNS), which specifies that the measurements be a duration of at least 10 minutes and shall be continued past 10 minutes until the fluctuations in the displayed L_{eq} is less than 0.5 dBA.

5.2 Noise Measurement Results

The results of the noise level measurements are presented in Table F and the noise monitoring data printouts are included in Appendix B. Table F shows the existing noise levels in the project vicinity ranges between 57.0 dBA L_{eq} and 62.3 dBA L_{eq}.

Table F – Existing (Ambient) Noise Level Measurements

Site No.	Description	Primary Noise Source	Start Time of Measurement	Noise Level (dBA L_{eq}/L_{max})
1	Located on the project site, approximately 140 feet northwest of Riverside Drive center line and 300 feet southwest of Collier Avenue center line.	Riverside Drive	11:34 a.m.	62.3/86.0
2	Located at nearest home approximately 1,700 feet west of the project site.	Riverside Drive	11:51 a.m.	57.0/95.5

Source: Noise measurements taken with a Larson Davis Model 831 Type 1 precision sound level meter on Tuesday, March 28, 2017.

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Construction Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table G below provides a list of the construction equipment anticipated to be used for each phase of construction as detailed in *Air Quality and Greenhouse Gas Emissions Impact Analysis Kassab Travel Center Project*, prepared by Vista Environmental, Revised September 25, 2018.

Table G – Construction Equipment Noise Emissions and Usage Factors

Equipment Description	Number of Equipment	Acoustical Use Factor[1] (percent)	Spec 721.560 Lmax at 50 feet[2] (dBA, slow[3])	Actual Measured Lmax at 50 feet[4] (dBA, slow[3])
Site Preparation				
Grader	1	40	85	83
Scraper	1	40	85	84
Tractor, Loader or Backhoe[5]	1	40	84	N/A
Grading				
Grader	1	40	85	83
Rubber Tired Dozer	1	40	85	82
Tractor, Loader or Backhoe[5]	2	40	84	N/A
Building Construction				
Crane	1	16	85	81
Forklift (Gradall)	2	40	85	83
Generator	1	50	82	81
Welder	2	40	73	74
Tractor, Loader or Backhoe[5]	1	40	84	N/A
Paving				
Cement & Mortar Mixer	1	40	85	79
Paver	2	50	85	77
Paving Equipment	2	50	85	77
Roller	2	20	85	80
Architectural Coating				
Air Compressor	1	40	80	78

Notes:
[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
[2] Spec 721.560 is the equipment noise level utilized by the RCNM program.
[3] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[4] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
[5] For the tractor/loader/backhoe, the tractor noise level was utilized, since it is the loudest of the three types of equipment.
Source: Federal Highway Administration, 2006 and CalEEMod default equipment mix.

Table G also shows the associated measured noise emissions for each piece of equipment from the RCNM model and measured percentage of typical equipment use per day. Construction noise impacts to the nearby sensitive receptors have been calculated according to the equipment noise levels and usage factors listed in Table G and through use of the RCNM. For each phase of construction, the nearest piece

of equipment was placed at the shortest distance of the proposed activity to the nearest sensitive receptor and each subsequent piece of equipment was placed an additional 50 feet away

6.2 Operations-Related Noise

The proposed project would result in increases in traffic noise to the nearby roadways as well as introduce new sensitive receptors to the project site. The project noise impacts to the offsite roadways were analyzed through use of the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108 (FHWA Model). The following section provides a discussion of the software and modeling input parameters used in this analysis and a discussion of the resultant existing noise model.

FHWA Model Methodology

In order to quantify the potential noise impacts created by vehicular traffic generated by the proposed project and compare them to the without project noise levels, the roadway noise environment was modeled using the FHWA Model. The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the reference energy mean emission level to account for: the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT) and the percentage of ADT which flows during the day, evening and night, the travel speed, the vehicle mix on the roadway, which is a percentage of the volume of automobiles, medium trucks and heavy trucks, the roadway grade, the angle of view of the observer exposed to the roadway and site conditions ("hard" or "soft" relates to the absorption of the ground, pavement or landscaping). The following section provides a discussion of the software and modeling input parameters used in this analysis and a discussion of the resultant existing noise model.

FHWA Model Traffic Noise Prediction Model Inputs

The roadway parameters used for this study are presented in Table H. The roadway classifications are based on the City's General Plan Circulation Element. The roadway speeds are based on the posted speed limits. The distance to the nearest sensitive receptor was determined by measuring the distance from the roadway centerline to the nearest residence. Since the study area is located in a suburban environment and landscaping or natural vegetation exists along the sides of all analyzed roadways, soft site conditions were modeled.

Table H – FHWA Model Roadway Parameters

Roadway	Segment	General Plan Classification	Vehicle Speed (MPH)	Distance to Nearest Receptor[1] (feet)
Central Avenue (SR-74)	East of Dexter Avenue	Augmented Urban Arterial	55	70
Riverside Drive (SR-74)	West of Gunnerson Street – Strickland Avenue	Urban Arterial	40	60
Riverside Drive (SR-74)	East of Lakeshore Drive	Urban Arterial	40	60
Riverside Drive (SR-74)	West of Lakeshore Drive	Urban Arterial	40	55
Lakeshore Drive	North of Riverside Drive (SR-74)	Urban Arterial	40	60
Lakeshore Drive	South of Riverside Drive (SR-74)	Urban Arterial	40	140

Notes:
[1] Distance measured from nearest structure to centerline of roadway.
Source: Dudek, 2018; and City of Lake Elsinore, 2011.

The existing and the existing plus ambient plus cumulative without project and with project average daily traffic (ADT) volumes on the study area roadways were obtained from the *Traffic Impact Study Kassab Travel Center, City of Lake Elsinore, CA*, prepared by prepared by Dudek, revised August 31, 2018. The existing plus ambient and cumulative ADT volumes were calculated based on the existing plus ambient plus cumulative volumes. The ADT volumes were calculated by multiplying the PM peak hour volumes by 12. The ADT volumes have been provided for both without the project and with project conditions for the existing, existing plus ambient, and cumulative scenarios. The ADT volumes used in this analysis are shown in Table I.

Table I – Average Daily Traffic Volumes

		Average Daily Traffic Volumes					
Roadway	**Segment**	**Existing**	**Existing + Project**	**Existing + Ambient**	**Existing + Ambient + Project**	**Cumulative**	**Cumulative + Project**
Central Avenue (SR-74)	East of Dexter Avenue	41,100	41,360	45,590	45,850	62,140	62,400
Riverside Drive (SR-74)	West of Gunnerson Street – Strickland Avenue	21,020	21,290	21,890	22,160	31,270	31,540
Riverside Drive (SR-74)	East of Lakeshore Drive	21,050	21,310	21,930	22,190	31,350	31,610
Riverside Drive (SR-74)	West of Lakeshore Drive	24,180	24,300	25,190	25,310	29,840	29,960
Lakeshore Drive	North of Riverside Drive (SR-74)	14,760	16,920	15,480	17,640	17,900	20,060
Lakeshore Drive	South of Riverside Drive (SR-74)	13,760	13,860	14,350	14,450	16,810	16,910

Source: Dudek, 2018; and City of Lake Elsinore, 2011.

The vehicle mix used in the FHWA-RD-77-108 Model is shown in Table J. the State Route 74 distribution was obtained from the *2015 Annual Average Daily Truck Traffic on the California State Highway System* (Caltrans, 2016) for State Route 74 west of Interstate 15, which is the nearest available measured vehicle mix to the project site. The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks, and heavy trucks for input into the FHWA model.

Table J – Roadway Vehicle Mix

	Traffic Flow Distributions			
Vehicle Type	**Day (7 a.m. to 7 p.m.)**	**Evening (7 p.m. to 10 p.m.)**	**Night (10 p.m. to 7 a.m.)**	**Overall**
Automobiles	62.99%	12.91%	15.10%	91.00%
Medium Trucks	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	1.47%	0.14%	1.08%	2.69%

Source: Caltrans, 2016.

FHWA Model Source Assumptions

To assess the roadway noise generation in a uniform manner, all vehicles are analyzed at the single lane equivalent acoustic center of the roadway being analyzed. In order to determine the height above the road grade where the noise is being emitted from, each type of vehicle has been analyzed independently with autos at road grade, medium trucks at 2.3 feet above road grade, and heavy trucks at 8 feet above road grade. These elevations were determined through a noise-weighted average of the elevation of the exhaust pipe, tires and mechanical parts in the engine, which are the primary noise emitters from a vehicle.

6.3 Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table K gives approximate vibration levels for particular construction activities. The data in Table K provides a reasonable estimate for a wide range of soil conditions.

Table K – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L_v)at 25 feet
Pile driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, May 2006.

The construction-related and operational vibration impacts have been calculated through the vibration levels shown above in Table K and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table G.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the proposed project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above noise levels existing without the proposed project; or
- Exposure of persons residing or working in the project area to excessive noise levels from aircraft.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not expose persons to or generate noise levels in excess of standards established in the General Plan or Noise Ordinance or applicable standards of other agencies. The following section calculates the potential noise emissions associated with the construction and operations of the proposed project and compares the noise levels to the City standards.

Construction-Related Noise

The construction activities for the proposed project are anticipated to include site preparation and grading of the 2.84-acre project site, building construction of the 18-pump, 6,092 square foot gas station, 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive-thru window, paving of the onsite roads an parking areas, and application of architectural coatings. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are offsite workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet southwest of the project site.

Section 17.176.080(F)(1) of the City's Municipal Code restricts construction activities from occurring between the weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on weekends or holidays. Section 17.176.080(F)(2) of the City's Municipal Code limits construction noise that occurs at the nearby business uses to 85 dBA from mobile equipment and 75 dBA from stationary equipment and at the nearby single-family homes to 75 dBA for mobile equipment and 60 dBA for stationary equipment.

Construction noise impacts to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table G – Construction Equipment Noise Emissions and Usage Factors. The results are shown below in Table L and the RCNM printouts are provided in Appendix C.

Table L – Worst Case Construction Noise Levels at Nearest Receptors

Construction Phase	Off-Site Workers to Northwest[1]		Single-Family Homes to Southwest[2]	
	Distance (feet)	Noise Level (dBA Leq)[3]	Distance (feet)	Noise Level (dBA Leq)[3]
Site Preparation	100	**77**	1,700	54
Grading	100	**77**	1,700	55
Building Construction	131	72	1,720	54
Paving	106	72	1,706	52
Painting	131	65	1,720	43
City's Mobile Equipment Threshold		**85**		**75**
City's Stationary Equipment Threshold		**75**		**60**

Notes:
[1] Off-Site Worker noise threshold from Section17.176.080(F)(2) of the Municipal Code for Business Properties.
[1] City construction noise threshold from Section 17.176.080(F)(2) of the Municipal Code for Type I Areas.
Source: RCNM, Federal Highway Administration, 2006

Table L shows that the greatest noise impacts at the nearby off-site workers would occur during the site preparation and grading phases of construction, with a noise level as high as 77 dBA, which is within the City's mobile equipment threshold for business properties of 85 dBA. However, the site preparation and grading phases have the potential to exceed the City's stationary equipment threshold of 75 dBA at the nearest off-site workers. This would be considered a significant impact.

Table L also shows that the greatest noise impacts at the nearest home would occur during grading, with a noise level as high as 55 dBA, which is within both the City's mobile equipment threshold of 75 dBA and stationary equipment threshold of 60 dBA.

Mitigation Measure 1 is provided that would require any stationary construction equipment that is used within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and nearby sensitive receptors. With implementation of Mitigation Measure 1, construction-related noise impacts would be reduced to within the City noise standards.

Operational-Related Noise

The operation of the proposed project may generate onsite noise levels that exceed City standards at the existing nearby sensitive receptors. The operation of the proposed project may create an increase in onsite noise levels from rooftop mechanical equipment, air/water machine, gas fueling activities, parking lot activities, delivery truck activities, and onsite operation of a drive-thru speaker.

Section 17.176.060(A) of the Municipal Code limits onsite noise sources to 65 dBA between 7:00 a.m. and 10:00 p.m. and 60 dBA between 10:00 p.m. and 7:00 a.m. at the adjacent existing commercial property on the northwest side and the proposed commercial property on the southwest side of the project site. Section 8.06.060(A) also provides residential noise standards, however the nearest residential uses are located 1,700 feet to the southwest and due to the distance, no noise impacts are anticipated to the nearby residential uses.

In order to determine the noise impacts from rooftop mechanical equipment, parking lot activities, delivery truck activities, air/water machine, gas fueling activities, and drive thru speakers, reference noise measurements were taken of each noise source and are shown below in Table M. Table M also shows the anticipated noise level from each source at the nearest offsite receptors. The onsite noise source calculations and operational reference noise measurements are shown in Appendix D.

Table M – Operational Noise Levels at the Nearby Commercial Uses Prior to Mitigation

	Reference Noise Measurements		Noise Levels at Northwest Property Line		Noise Levels at Southwest Property Line	
Noise Source	Distance of Measurement (feet)	Noise Level (dBA L_{eq})	Distance Receptor to Source (feet)	Noise Level[1] (dBA L_{eq})	Distance Receptor to Source (feet)	Noise Level (dBA L_{eq})
Rooftop Equipment	10	66.6	55	52	25	59
Parking Lot	5	63.1	6	62	6	62
Truck Delivery	30	54.8	6	69	80	46
Air/Water	5	66.9	3	71	135	38
Fueling Pumps	10	61.7	105	41	145	38
Drive Thru Speaker	10	61.2	90	42	30	52
Combined Noise Levels				**74**		**64**
City Noise Standards (Day/Night)[1]				**65/60**		**65/60**
Exceed City Standards (Day/Night)?				**Yes/Yes**		**No/Yes**

Notes:
[1] City noise standards from Section 17.176.060(A)(1) of the Municipal Code.
Source: Noise calculation methodology from Caltrans, 2013.

Table M shows that the combined noise levels at the adjacent commercial uses would be 74 dBA at the northwest property line and would be 64 dBA at the southwest property line, which are based on the worst-case scenario of the simultaneous occurrence of all noise producing activities from operation of the proposed project. Table M shows that the combined noise levels would exceed the City's commercial land use daytime noise standard of 65 dBA on the northwest property line and would exceed the commercial use nighttime noise standard of 60 dBA at both the northwest and southwest property lines. This would be considered a significant impact.

Mitigation Measure 2 is provided that would require the project applicant to construct a minimum 8-foot high masonry wall on the northwest and southwest property lines of the project site. The operational onsite noise levels were recalculated based on implementation of Mitigation Measure 2 and the results are shown in Table N. Table N shows that with implementation of Mitigation Measure 2, the combined noise levels at the adjacent commercial uses would be 58 dBA at the northwest property line and would be 51 dBA at the southwest property line, which are within both the City's daytime and nighttime noise standards for commercial land uses. With implementation of Mitigation Measure 2, operational-related noise impacts would be reduced to within the City noise standards.

Therefore, with implementation of Mitigation Measures 1 and 2, the proposed project would not expose persons to noise levels in excess of standards established in the local general plan or noise ordinance.

Table N – Mitigated Operational Noise Levels at the Nearby Commercial Uses

Noise Source	Reference Noise Measurements: Distance of Measurement (feet)	Reference Noise Measurements: Noise Level (dBA L_{eq})	Noise Levels at Northwest Property Line: Distance Receptor to Source (feet)	Noise Levels at Northwest Property Line: Noise Level[1] (dBA L_{eq})	Noise Levels at Southwest Property Line: Distance Receptor to Source (feet)	Noise Levels at Southwest Property Line: Noise Level[1] (dBA L_{eq})
Rooftop Equipment	10	66.6	55	47	25	48
Parking Lot	5	63.1	6	46	6	46
Truck Delivery	30	54.8	6	55	80	35
Air/Water	5	66.9	3	54	135	27
Fueling Pumps	10	61.7	105	30	145	27
Drive Thru Speaker	10	61.2	90	31	30	40
Combined Noise Levels				**58**		**51**
City Noise Standards (Day/Night)[2]				**65/60**		**65/60**
Exceed City Standards (Day/Night)?				**No/No**		**No/No**

Notes:
[1] Calculated noise level includes attenuation provided by the 8-foot high wall required per Mitigation Measure 2.
[2] City noise standards from Section 17.176.060(A)(1) of the Municipal Code.
Source: Noise calculation methodology from Caltrans, 2013.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 1:

The project applicant shall require any construction contractor that needs to use stationary construction equipment within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and nearest sensitive receptors.

Mitigation Measure 2:

The project applicant shall construct a minimum 8-foot high masonry wall that is free of cutouts or openings along the northwest and southwest property lines of the project site. The portions of the walls that are within the setbacks of Riverside Drive and Collier Avenue shall be limited to 3 feet in height per the wall height limitations detailed in Sections 17.112.070 and 17.112.090 of the City of Lake Elsinore Municipal Code.

Level of Significance After Mitigation

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. The following section analyzes the potential vibration impacts associated with the construction and operations of the proposed project.

Construction-Related Vibration Impacts

The construction activities for the proposed project are anticipated to include site preparation and grading of the 2.84-acre project site, building construction of the 18-pump, 6,092 square foot gas station, 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive-thru window,

paving of the onsite roads an parking areas, and application of architectural coatings. The nearest off-site receptors to the project site are the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet west of the project site.

Section 17.176.080(G) of the City's Municipal Code restricts the operation of any device that creates a vibration which is above the vibration threshold of any individual at or beyond the property boundary of the source. Since the City's Municipal does not provide a quantifiable vibration level, Caltrans guidance that is detailed above in Section 4.2 has been utilized, which defines the threshold of perception from transient sources at 0.25 inch per second PPV.

The primary source of vibration during construction would be from the operation of a bulldozer. From Table K above a large bulldozer would create a vibration level of 0.089 inch per second PPV at 25 feet. Based on typical propagation rates, the vibration level at the nearest offsite receptor (100 feet away) would be 0.02 inch per second PPV. The vibration level at the nearest offsite receptor would be within the 0.25 inch per second PPV threshold detailed above. Impacts would be less than significant.

Operations-Related Vibration Impacts

The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast food restaurant with a drive-thru window, and a parking lot. The proposed project would result in the operation of semi-trucks on the project site, which are a known source of vibration. The nearest off-site receptors to the proposed project are offsite workers located as near as 106 feet from where trucks could potentially operate on the project site.

Section 17.176.080 of the City's Municipal Code limits vibration activities to vibration levels that are not above an individual person's vibration threshold at or beyond the property boundary where the source is located. Since the onsite operation of semi-truck has the potential to create groundborne vibration that may expose persons to excessive vibration levels. In order to provide a conservative analysis, the operational activities have been analyzed based on the standard of being discernable at the nearest offsite workers, which are located as near as 80 feet from where a truck may operate onsite.

Caltrans has done extensive research on vibration level created along freeways and State Routes and their vibration measurements of roads have never exceeded 0.08 inches per second PPV at 15 feet from the center of the nearest lane, with the worst combinations of heavy trucks. Truck activities would occur onsite as near as 80 feet from the nearest off-site worker. Based on typical propagation rates, the vibration level at the nearest offsite worker would by 0.01 inch per second PPV. Caltrans research found that human response to transient sources becomes distinctly perceptible at 0.25 inch per second PPV. Therefore, vibration created from operation of the proposed project would be below the threshold of perception at the nearest offsite worker. Impacts would be less than significant.

Level of Significance

Less than significant impact.

7.4 Permanent Noise Level Increase

The ongoing operation of the proposed project may result in a potential substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the proposed project. Potential noise impacts associated with the operations of the proposed project would be from project-generated vehicular traffic on the nearby roadways and from onsite activities, which have been analyzed separately below.

Roadway Vehicular Noise

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project does not propose any uses that would require a substantial number of truck trips and the proposed project would not alter the speed limit on any existing roadway so the proposed project's potential offsite noise impacts have been focused on the noise impacts associated with the change of volume of traffic that would occur with development of the proposed project.

Neither the General Plan nor the CEQA Guidelines define what constitutes a "substantial permanent increase to ambient noise levels", as such, this impact analysis has utilized guidance from the Federal Transit Administration for a moderate impact that has been detailed above in Table A.

The potential offsite traffic noise impacts created by the on-going operations of the proposed project have been analyzed through utilization of the FHWA model and parameters described above in Section 6.2 and the FHWA model noise calculation spreadsheets are provided in Appendix E. The proposed project's offsite traffic noise impacts have been analyzed for the existing, existing plus ambient, and cumulative conditions and are discussed below.

Existing Conditions

The proposed project's potential offsite noise impacts have been calculated through a comparison of the Existing scenario to the Existing With Project Scenario. The results of this comparison are shown in Table O.

Table O – Existing Year Project Traffic Noise Contributions

		dBA Ldn at Nearest Receptor[1]			
Roadway	Segment	Existing	Existing With Project	Project Contribution	Increase Threshold
Central Avenue (SR-74)	East of Dexter Avenue	74.3	74.3	0.0	+1 dBA
Riverside Drive (SR-74)	West of Gunnerson Street-Strickland Avenue	68.3	68.4	0.1	+1 dBA
Riverside Drive (SR-74)	East of Lakeshore Drive	68.3	68.4	0.1	+1 dBA
Riverside Drive (SR-74)	West of Lakeshore Drive	70.0	70.0	0.0	+1 dBA
Lakeshore Drive	Northwest of Riverside Drive (SR-74)	66.8	67.4	0.6	+1 dBA
Lakeshore Drive	Southeast of Riverside Drive (SR-74)	58.9	58.9	0.0	+3 dBA

Notes:
[1] Distances to nearest residential uses are shown in Table H. The calculated noise levels do not take into account existing noise barriers
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table O shows that for the existing conditions, the proposed project's permanent noise increases to the nearby sensitive receptors from the generation of additional vehicular traffic would not exceed the FTA's allowable increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the existing conditions. Impacts would be less than significant.

Existing Plus Ambient Conditions

The proposed project's potential offsite noise impacts have been calculated through a comparison of the existing plus ambient without project scenario to the existing plus ambient with project scenario. The results of this comparison are shown in Table P.

Table P – Existing Plus Ambient Project Traffic Noise Contributions

		dBA Ldn at Nearest Receptor[1]			
Roadway	Segment	Existing + Ambient	Existing + Ambient + Project	Project Contribution	Increase Threshold
Central Avenue (SR-74)	East of Dexter Avenue	74.6	74.6	0.0	+1 dBA
Riverside Drive (SR-74)	West of Gunnerson Street-Strickland Avenue	68.5	68.5	0.0	+1 dBA
Riverside Drive (SR-74)	East of Lakeshore Drive	68.5	68.5	0.0	+1 dBA
Riverside Drive (SR-74)	West of Lakeshore Drive	70.1	70.2	0.1	+1 dBA
Lakeshore Drive	Northwest of Riverside Drive (SR-74)	67.0	67.5	0.5	+1 dBA
Lakeshore Drive	Southeast of Riverside Drive (SR-74)	59.1	59.1	0.0	+3 dBA

Notes:
[1] Distances to nearest residential uses are shown in Table H. The calculated noise levels do not take into account existing noise barriers.
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table P shows that for the existing plus ambient conditions, the proposed project's permanent noise increases to the nearby sensitive receptors from the generation of additional vehicular traffic would not exceed the FTA's allowable increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the existing plus ambient conditions. Impacts would be less than significant.

Cumulative Conditions

The proposed project's potential offsite noise impacts have been calculated through a comparison of the cumulative without project scenario to the cumulative with project scenario. The results of this comparison are shown in Table Q.

Table Q – Cumulative Project Traffic Noise Contributions

		dBA Ldn at Nearest Receptor[1]			
Roadway	Segment	Cumulative No Project	Cumulative With Project	Project Contribution	Increase Threshold
Central Avenue (SR-74)	East of Dexter Avenue	76.1	76.1	0.0	+0 dBA
Riverside Drive (SR-74)	West of Gunnerson Street-Strickland Avenue	70.0	70.1	0.1	+1 dBA
Riverside Drive (SR-74)	East of Lakeshore Drive	70.0	70.1	0.1	+1 dBA
Riverside Drive (SR-74)	West of Lakeshore Drive	70.9	70.9	0.0	+1 dBA
Lakeshore Drive	Northwest of Riverside Drive (SR-74)	67.6	68.1	0.5	+1 dBA
Lakeshore Drive	Southeast of Riverside Drive (SR-74)	59.8	59.8	0.0	+3 dBA

Notes:
[1] Distances to nearest residential uses are shown in Table H. The calculated noise levels do not take into account existing noise barriers
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table Q shows that for the cumulative conditions, the proposed project's permanent noise increases to the nearby sensitive receptors from the generation of additional vehicular traffic would not exceed the FTA's allowable increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the cumulative conditions. Impacts would be less than significant.

Onsite Noise Sources

The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast food restaurant with a drive-thru window, and a parking lot. The operation of the proposed project may create an increase in onsite noise levels from noise impacts from rooftop mechanical equipment, air/water machine, gas fueling activities, parking lot activities, delivery truck activities, and onsite operation of a drive-thru speaker.

Section 17.176.060(A) of the Municipal Code limits onsite noise sources to 65 dBA between 7:00 a.m. and 10:00 p.m. and 60 dBA between 10:00 p.m. and 7:00 a.m. at the adjacent existing commercial property on the northwest side and the proposed commercial property on the southwest side of the project site. Section 8.06.060(A) also provides residential noise standards, however the nearest residential uses are located 1,700 feet to the southwest and due to the distance, no noise impacts are anticipated to the nearby residential uses.

The analysis provided above in Section 7.2 found that the noise levels from onsite noise sources at the adjacent commercial uses would be 74 dBA at the northwest property line and would be 64 dBA at the southwest property line, which are based on the worst-case scenario of the simultaneous occurrence of all noise producing activities from operation of the proposed project. The analysis provided in Section 7.2 shows that the combined noise levels would exceed the City's commercial land use daytime noise standard of 65 dBA on the northwest property line and would exceed the commercial use nighttime noise standard of 60 dBA at both the northwest and southwest property lines. This would be considered a significant impact.

Mitigation Measure 2 is provided that would require the project applicant to construct a minimum 8-foot high masonry wall on the northwest and southwest property lines of the project site. The operational onsite noise levels were recalculated based on implementation of Mitigation Measure 2 and the results are shown above in Section 7.2, which shows that with implementation of Mitigation Measure 2, the combined noise levels at the adjacent commercial uses would be 58 dBA at the northwest property line and would be 51 dBA at the southwest property line, which are within both the City's daytime and nighttime noise standards for commercial land uses. Therefore, with implementation of Mitigation Measure 2, the proposed project is not anticipated to cause a substantial permanent increase in ambient noise levels from onsite sources. Impacts would be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 2 provided above in Section 7.2.

Level of Significance After Mitigation

Less than significant impact.

7.5 Temporary Noise Level Increase

The proposed project may create a substantial temporary or periodic increase in ambient noise levels in the project vicinity above noise levels existing without the proposed project. The construction activities for the proposed project are anticipated to include site preparation and grading of the 2.84-acre project site, building construction of the 18-pump, 6,092 square foot gas station, 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive-thru window, paving of the onsite roads and parking areas, and application of architectural coatings. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet southwest of the project site.

The construction noise impacts to the nearby sensitive receptors has been previously analyzed above in Section 7.2, which found that that the greatest noise impacts at the nearby off-site workers would occur during the site preparation and grading phases of construction, with a noise level as high as 77 dBA, which is within the City's mobile equipment threshold for business properties of 85 dBA. However, the site preparation and grading phases have the potential to exceed the City's stationary equipment threshold of 75 dBA at the nearest off-site workers. This would be considered a significant impact.

Section 7.2 also shows that the greatest noise impacts at the nearest homes would occur during grading of the project site, with a noise level as high as 55 dBA, which is within both the City's mobile equipment threshold of 75 dBA and stationary equipment threshold of 60 dBA.

Mitigation Measure 1 is provided that would require any stationary construction equipment that is used within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and any nearby sensitive receptors. With implementation of Mitigation Measure 1, the proposed project would not create a substantial temporary or periodic increase in ambient noise levels.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 1 provided above in Section 7.2.

Level of Significance After Mitigation

Less than significant impact.

7.6 Aircraft Noise

The proposed project would not expose people residing or working in the project area to excessive noise levels from aircraft. The nearest airport is Skylark Airport, located approximately five miles southeast of the project site. The project site is located outside of the 60 dBA CNEL noise contours of this airport and the site observations during the noise measurements found that although aircraft noise is occasionally audible at the project site, the noise created by the aircraft is not loud enough to measurably increase the

ambient noise levels, which is primarily created by Riverside Drive and Collier Avenue. Impacts would be less than significant.

Level of Significance

Less than significant impact.

8.0 REFERENCES

California Department of Transportation, *2015 Annual Average Daily Truck Traffic on the California State Highway System*, 2016.

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

California Department of Transportation, *Transportation- and Construction-Induced Vibration Guidance Manual*, September 2013.

City of Lake Elsinore, *City of Lake Elsinore General Plan*, December 13, 2011.

City of Lake Elsinore, *City of Lake Elsinore General Plan Update Final Recirculated Program Environmental Impact Report*, December 13, 2011.

City of Lake Elsinore, *Lake Elsinore Municipal Code,* February 24, 2015.

Dudek, *Traffic Impact Study Kassab Travel Center, City of Lake Elsinore,* revised August 31, 2018.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* May 2006.

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide,* January, 2006.

Vista Environmental, *Air Quality and Greenhouse Gas Emissions Impact Analysis Kassab Travel Center Project, City of Lake Elsinore,* revised September 26, 2018.

APPENDIX A

Study Area Photo Index

Noise Measurement Site A - Looking North

Noise Measurement Site A - Looking Northeast

Noise Measurement Site A - Looking East

Noise Measurement Site A - Looking Southeast

Noise Measurement Site A - Looking South

Noise Measurement Site A - Southwest

Noise Measurement Site A - Looking West

Noise Measurement Site A - Looking Northwest

Noise Measurement Site B - Looking North

Noise Measurement Site B - Looking Northeast

Noise Measurement Site B - Looking East

Noise Measurement Site B - Looking Southeast

Noise Measurement Site B - Looking South

Noise Measurement Site B - Looking Southwest

Noise Measurement Site B - Looking West

Noise Measurement Site B - Looking Northwest

APPENDIX B

Field Noise Measurement Printouts

General Information

Serial Number	02509
Model	831
Firmware Version	2.301
Filename	831_Data.008
User	GT
Job Description	Lake Elsinore Tige Water Sports
Location	At Project Site Approx 110' NW of Riverside Dr, 350' SW of Collie
Measurement Description	
Start Time	Tuesday, 2017 March 28 11:34:21
Stop Time	Tuesday, 2017 March 28 11:44:21
Duration	00:10:00.7
Run Time	00:10:00.7
Pause	00:00:00.0
Pre Calibration	Tuesday, 2017 March 28 11:12:45
Post Calibration	None
Calibration Deviation	---

Note

Noise from vehicles on Riversie Dr, Collier Ave, and Interstate 15
72F, 28.67 in Hg, 22% Hu, 10 mph wind, clear sky

Overall Data

LAeq		62.3	dB
LASmax	2017 Mar 28 11:40:26	72.6	dB
LApeak (max)	2017 Mar 28 11:40:26	86.0	dB
LASmin	2017 Mar 28 11:39:59	54.0	dB
LCeq		73.8	dB
LAeq		62.3	dB
LCeq - LAeq		11.5	dB
LAIeq		63.4	dB
LAeq		62.3	dB
LAIeq - LAeq		1.1	dB
Ldn		62.3	dB
LDay 07:00-23:00		62.3	dB
LNight 23:00-07:00		---	dB
Lden		62.3	dB
LDay 07:00-19:00		62.3	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		90.1	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00		67.1	dBA
LAS10.00		64.4	dBA
LAS33.30		61.5	dBA
LAS50.00		60.4	dBA
LAS66.60		59.5	dBA
LAS90.00		57.5	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)		9 / 69.4	s
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.8	dB
Noise Floor	17.0	dB
Overload	143.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	78.6	73.7	68.5	67.1	68.9	64.0	59.4	58.5	48.9	40.5	40.3	42.9
LZSmax	89.7	86.3	79.0	79.1	81.7	79.8	73.1	68.6	60.7	55.7	55.0	45.8
LZSmin	52.5	59.1	57.5	55.5	54.5	47.9	50.7	51.9	41.4	36.2	39.3	42.8

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	75.3	73.7	72.0	70.5	68.6	67.1	65.1	63.4	62.3	61.5	62.7	62.8
LZSmax	87.2	85.3	83.0	82.7	82.7	79.3	75.6	75.1	74.0	72.0	72.4	79.1
LZSmin	44.4	48.6	47.7	52.8	53.4	53.5	49.9	52.6	52.1	51.5	52.8	51.7

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	63.8	66.4	60.1	62.2	57.1	55.9	54.8	54.7	54.6	55.3	54.0	50.9
LZSmax	77.7	81.7	76.5	79.7	73.2	74.4	71.0	68.7	65.5	65.1	66.0	61.8
LZSmin	50.6	48.8	45.3	44.6	42.2	41.0	42.7	46.4	46.3	47.7	47.7	44.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	47.0	42.4	39.7	37.0	35.2	34.4	34.5	35.2	36.7	37.0	37.9	39.5
LZSmax	57.5	55.2	54.6	52.5	50.7	48.8	48.4	47.6	52.9	41.3	40.3	41.5
LZSmin	39.7	34.5	30.9	30.6	31.1	31.6	32.9	34.4	34.7	36.7	37.7	38.4

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	28 Mar 2017 11:12:45	-25.8
PRM831	02 Nov 2016 10:44:45	-25.2
PRM831	22 Sep 2016 15:49:59	-26.5
PRM831	24 Aug 2016 19:03:10	-26.1
PRM831	26 Jul 2016 10:53:46	-26.0
PRM831	26 Jul 2016 09:33:01	-26.4
PRM831	26 Jul 2016 07:41:35	-25.1
PRM831	25 Jul 2016 14:18:53	-26.4
PRM831	25 Jul 2016 12:49:23	-25.2
PRM831	25 Jul 2016 09:43:52	-24.8
PRM831	25 Jul 2016 07:24:48	-25.6

General Information

Serial Number	02509
Model	831
Firmware Version	2.301
Filename	831_Data.009
User	GT
Job Description	Lake Elsinore Tige Water Sports
Location	At Nearest Home approx 1,500 ft west of Project
Measurement Description	
Start Time	Tuesday, 2017 March 28 11:51:44
Stop Time	Tuesday, 2017 March 28 12:01:55
Duration	00:10:11.4
Run Time	00:10:11.4
Pause	00:00:00.0
Pre Calibration	Tuesday, 2017 March 28 11:12:45
Post Calibration	None
Calibration Deviation	---

Note

Located approx 25' SW of Baker St CL and 15' NW of Turnbull Ave
Noise primmarily from Interstate 15
72 F, 28.67 in Hg, 22% Hu, 10 mph wind, clear sky

Overall Data

LAeq		57.0	dB
LASmax	2017 Mar 28 11:53:59	75.5	dB
LApeak (max)	2017 Mar 28 11:53:58	95.5	dB
LASmin	2017 Mar 28 11:59:27	47.9	dB
LCeq		69.2	dB
LAeq		57.0	dB
LCeq - LAeq		12.2	dB
LAIeq		60.8	dB
LAeq		57.0	dB
LAIeq - LAeq		3.8	dB
Ldn		57.0	dB
LDay 07:00-23:00		57.0	dB
LNight 23:00-07:00		---	dB
Lden		57.0	dB
LDay 07:00-19:00		57.0	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		84.8	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	61.6	dBA
LAS10.00	58.9	dBA
LAS33.30	52.5	dBA
LAS50.00	51.4	dBA
LAS66.60	50.8	dBA
LAS90.00	50.0	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	3 / 18.1	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.8	dB
Noise Floor	17.0	dB
Overload	143.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	76.9	70.9	64.7	61.2	63.6	57.7	54.9	51.1	46.6	43.0	40.7	43.0
LZSmax	92.8	86.1	78.0	73.7	83.7	78.8	74.1	68.8	64.3	60.2	53.9	45.7
LZSmin	53.1	57.3	54.2	52.8	47.0	42.8	46.2	44.6	36.4	36.6	39.4	42.3

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	74.3	71.3	69.7	67.5	66.0	64.3	61.7	59.3	57.5	55.8	56.4	57.1
LZSmax	90.9	86.7	84.5	84.0	80.9	79.8	76.3	73.4	71.6	69.6	71.3	72.6
LZSmin	44.8	44.7	48.8	53.3	49.4	50.2	49.4	48.9	48.3	42.5	47.2	38.2

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	56.6	59.5	59.9	53.0	53.0	52.3	51.4	50.4	48.5	47.9	46.3	44.2
LZSmax	73.8	77.9	82.2	74.5	73.5	73.5	72.2	69.0	64.5	66.3	63.9	60.5
LZSmin	41.2	41.1	38.4	36.9	37.7	32.0	40.3	42.1	41.4	41.3	40.0	36.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	42.9	41.6	40.7	39.7	38.1	36.2	35.9	35.6	36.3	37.2	37.9	39.6
LZSmax	61.0	60.4	58.5	56.7	56.6	52.1	52.8	47.8	45.9	41.7	41.3	41.2
LZSmin	32.4	30.9	30.9	31.1	31.8	32.5	33.4	34.4	35.5	36.2	37.7	38.9

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	28 Mar 2017 11:12:45	-25.8
PRM831	02 Nov 2016 10:44:45	-25.2
PRM831	22 Sep 2016 15:49:59	-26.5
PRM831	24 Aug 2016 19:03:10	-26.1
PRM831	26 Jul 2016 10:53:46	-26.0
PRM831	26 Jul 2016 09:33:01	-26.4
PRM831	26 Jul 2016 07:41:35	-25.1
PRM831	25 Jul 2016 14:18:53	-26.4
PRM831	25 Jul 2016 12:49:23	-25.2
PRM831	25 Jul 2016 09:43:52	-24.8
PRM831	25 Jul 2016 07:24:48	-25.6

APPENDIX C

RCNM Model Construction Noise Calculations

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/25/2017
Case Description: Kassab Travel Center - Site Prep

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		100	0
Scraper	No	40		83.6	150	0
Tractor	No	40	84		200	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader		79	75	N/A	N/A	N/A	N/A
Scraper		74.0	70.1	N/A	N/A	N/A	N/A
Tractor		72.0	68.0	N/A	N/A	N/A	N/A
	Total	**79**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S	Residential	57.0	57.0	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		1700	0
Scraper	No	40		83.6	1750	0
Tractor	No	40.0	84		1800	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader		54	50	N/A	N/A	N/A	N/A
Scraper		53	49	N/A	N/A	N/A	N/A
Tractor		53	49	N/A	N/A	N/A	N/A
	Total	**54**	**54**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/25/2017
Case Description: Kassab Travel Center - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to I	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		100	0
Dozer	No	40		81.7	150	0
Tractor	No	40	84		200	0
Tractor	No	40	84		250	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Grader		79.0	75.0	N/A	N/A	N/A	N/A
Dozer		72.1	68.1	N/A	N/A	N/A	N/A
Tractor		72.0	68.0	N/A	N/A	N/A	N/A
Tractor		70.0	66.0	N/A	N/A	N/A	N/A
	Total	**79**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40.0	85		1700	0
Dozer	No	40		81.7	1750	0
Tractor	No	40	84		1800	0
Tractor	No	40	84		1850	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Leq	Evening Lmax	Leq
Grader	54.4	50.4	N/A	N/A	N/A	N/A
Dozer	50.8	46.8	N/A	N/A	N/A	N/A
Tractor	52.9	48.9	N/A	N/A	N/A	N/A
Tractor	52.6	48.7	N/A	N/A	N/A	N/A
Total	**54**	**55**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/26/2017
Case Description: Kassab Travel Center - Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to N	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	131	0
Gradall	No	40		83.4	181	0
Gradall	No	40		83.4	231	0
Generator	No	50		80.6	281	0
Welder / Torch	No	40		74	331	0
Welder / Torch	No	40		74	381	0
Welder / Torch	No	40		74	431	0
Tractor	No	40	84		520	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane		72.2	64.2	N/A	N/A	N/A	N/A
Gradall		72.2	68.2	N/A	N/A	N/A	N/A
Gradall		70.1	66.1	N/A	N/A	N/A	N/A
Generator		65.6	62.6	N/A	N/A	N/A	N/A
Welder / Torch		57.6	53.6	N/A	N/A	N/A	N/A
Welder / Torch		56.4	52.4	N/A	N/A	N/A	N/A
Welder / Torch		55.3	51.3	N/A	N/A	N/A	N/A
Tractor		63.7	59.7	N/A	N/A	N/A	N/A
	Total	**72**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S\	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1720	0
Gradall	No	40		83.4	1770	0
Gradall	No	40		83.4	1820	0
Generator	No	50		80.6	1870	0
Welder / Torch	No	40		74	1920	0
Welder / Torch	No	40		74	1970	0
Welder / Torch	No	40		74	2020	0
Tractor	No	40	84		2070	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane	49.8	41.9	N/A	N/A	N/A	N/A
Gradall	52.4	48.4	N/A	N/A	N/A	N/A
Gradall	52.2	48.2	N/A	N/A	N/A	N/A
Generator	49.2	46.2	N/A	N/A	N/A	N/A
Welder / Torch	42.3	38.3	N/A	N/A	N/A	N/A
Welder / Torch	42.1	38.1	N/A	N/A	N/A	N/A
Welder / Torch	41.9	37.9	N/A	N/A	N/A	N/A
Tractor	51.7	47.7	N/A	N/A	N/A	N/A
Total	**52**	**54**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/26/2017
Case Description: Kassab Travel Center - Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to N	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	106	0
Paver	No	50		77.2	156	0
Paver	No	50		77.2	206	0
Roller	No	20		80	256	0
Roller	No	20		80	306	0
Tractor	No	40	84		356	0

	Calculated (dBA)		Results Noise Limits (dBA) Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	72.3	68.3	N/A	N/A	N/A	N/A
Paver	67.3	64.3	N/A	N/A	N/A	N/A
Paver	64.9	61.9	N/A	N/A	N/A	N/A
Roller	65.8	58.8	N/A	N/A	N/A	N/A
Roller	64.3	57.3	N/A	N/A	N/A	N/A
Tractor	67.0	63.0	N/A	N/A	N/A	N/A
Total	**72**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S\	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1706	0
Paver	No	50		77.2	1756	0
Paver	No	50		77.2	1806	0
Roller	No	20		80	1856	0
Roller	No	20		80	1906	0
Tractor	No	40	84		1956	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Concrete Mixer Truck	48.1	44.2	N/A	N/A	N/A	N/A
Paver	46.3	43.3	N/A	N/A	N/A	N/A
Paver	46.1	43.1	N/A	N/A	N/A	N/A
Roller	48.6	41.6	N/A	N/A	N/A	N/A
Roller	48.4	41.4	N/A	N/A	N/A	N/A
Tractor	52.2	48.2	N/A	N/A	N/A	N/A
Total	**52**	**52**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/26/2017
Case Description: Kassab Travel Center - Painting

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to N	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	131	0

Equipment		Results Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		69.3	65.3	N/A	N/A	N/A	N/A
	Total	**69**	**65**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1720	0

Equipment		Results Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		47	43	N/A	N/A	N/A	N/A
	Total	**47**	**43**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX D

Operational Reference Noise Measurements

Stationary Noise Calculations - Commercial Use Northwest of Project Site

Stationary Noise Sources	Reference Distance	Reference Leq	Northwest Property Line Distance	Leq	
					1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Rooftop HVAC	10	66.6	55	52	(eq. N-2141.2 of TeNS)
Parking Lot	5	63.1	6	62	
Truck Delivery	30	54.8	6	69	
Air/Water	5	66.9	3	71	
Gas Dispensing Facility	10	61.7	105	41	
Drive Thru Speaker	10	61.2	90	42	

Stationary Noise Sources	Distance from Receptor to Wall	Distance from source to Wall	Height of Wall (feet)	Without Wall Noise Level at Residence	With Wall Noise Level at Residence	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	Line of Sight (1=blocks line of sight)	fresnel	Barrier Atten
Rooftop HVAC	10	55	8	52	**47**	25	5	800	10.4403	57.57	68.01	0.00	1	0.0009	-4.90
Parking Lot	10	6	8	62	**46**	3	5	800	10.4403	7.81	16.12	2.13	1	6.0474	-15.92
Truck Delivery	10	6	8	69	**55**	5	5	800	10.4403	6.71	16.00	1.15	1	3.2669	-13.86
Air/Water	10	3	8	71	**54**	3	5	800	10.4403	5.83	13.15	3.12	1	8.8699	-16.86
Gas Dispensing Fa	10	105	8	41	**30**	5	5	800	10.4403	105.04	115.00	0.48	1	1.3743	-11.04
Drive Thru Speaker	10	90	8	42	**31**	5	5	800	10.4403	90.05	100.00	0.49	1	1.3946	-11.08
		Combined Noise Levels		**74**	**58**										

Stationary Noise Calculations - Commercial Use Southwest of Project Site

Stationary Noise Sources	Reference Distance	Reference Leq	Northwest Property Line Distance	Leq	
Rooftop HVAC	10	66.6	25	59	1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Parking Lot	5	63.1	6	62	(eq. N-2141.2 of TeNS)
Truck Delivery	30	54.8	80	46	
Air/Water	5	66.9	135	38	
Gas Dispensing Facility	10	61.7	145	38	
Drive Thru Speaker	10	61.2	30	52	

Stationary Noise Sources	Distance from Receptor to Wall	Distance from source to Wall	Height of Wall (feet)	Without Wall Noise Level at Residence	With Wall Noise Level at Residence	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	Line of Sight (1=blocks line of sight)	fresnel	Barrier Atten
Rooftop HVAC	10	25	8	59	**48**	25	5	800	10.4403	30.23	40.31	0.36	1	1.028	-10.34
Parking Lot	10	6	8	62	**46**	3	5	800	10.4403	7.81	16.12	2.13	1	6.047	-15.92
Truck Delivery	10	80	8	46	**35**	5	5	800	10.4403	80.06	90.00	0.50	1	1.412	-11.12
Air/Water	10	135	8	38	**27**	3	5	800	10.4403	135.09	145.01	0.52	1	1.476	-11.24
Gas Dispensing Fa	10	145	8	38	**27**	5	5	800	10.4403	145.03	155.00	0.47	1	1.341	-10.98
Drive Thru Speaker	10	30	8	52	**40**	5	5	800	10.4403	30.15	40.00	0.59	1	1.678	-11.64
		Combined Noise Levels		**64**	**51**										

General Information

Serial Number	02509
Model	831
Firmware Version	2.112
Filename	831_Data.005
User	GT
Job Description	Northwest Fresno Walmart Relocation
Location	Rooftop HVAC Unit
Measurement Description	
Start Time	Saturday, 2013 July 27 18:31:43
Stop Time	Saturday, 2013 July 27 18:41:44
Duration	00:10:01.1
Run Time	00:10:01.1
Pause	00:00:00.0
Pre Calibration	Saturday, 2013 July 27 17:53:07
Post Calibration	None
Calibration Deviation	---

Note

Located 10 feet southeast of rooftop HVAC Unit 14 located on western side of roof
94 F, 30% Hu., 29.45 in Hg, no wind, partly cloudy

Overall Data

LAeq		66.6	dB
LASmax	2013 Jul 27 18:33:16	67.6	dB
LApeak (max)	2013 Jul 27 18:32:17	81.6	dB
LASmin	2013 Jul 27 18:41:08	65.8	dB
LCeq		75.8	dB
LAeq		66.6	dB
LCeq - LAeq		9.2	dB
LAIeq		67.2	dB
LAeq		66.6	dB
LAIeq - LAeq		0.6	dB
Ldn		66.6	dB
LDay 07:00-23:00		66.6	dB
LNight 23:00-07:00		---	dB
Lden		66.6	dB
LDay 07:00-19:00		66.6	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		94.4	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	67.0	dBA
LAS10.00	66.9	dBA
LAS33.30	66.7	dBA
LAS50.00	66.6	dBA
LAS66.60	66.5	dBA
LAS90.00	66.3	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 601.1	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.8	dB
Noise Floor	17.1	dB
Overload	143.4	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	70.9	64.4	61.4	74.2	68.2	64.9	66.3	61.7	55.1	49.9	44.3	44.0
LZSmax	83.8	78.9	70.0	78.4	72.3	66.1	67.8	63.1	56.9	53.2	46.7	45.4
LZSmin	53.2	56.5	56.7	67.7	66.1	63.5	65.0	60.7	53.9	48.4	43.2	43.7

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	68.1	65.7	63.2	61.0	58.0	59.3	56.0	57.8	55.8	69.7	72.0	59.3
LZSmax	82.3	79.5	78.7	77.2	72.8	72.3	67.9	63.5	64.0	74.2	76.1	72.0
LZSmin	41.9	46.3	48.8	48.7	46.5	49.7	50.1	51.8	41.2	63.9	67.9	54.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	61.6	63.7	64.5	59.0	58.7	60.9	63.2	60.8	59.9	59.2	56.1	54.6
LZSmax	71.3	68.0	67.3	61.6	61.7	64.1	65.5	64.2	62.0	60.7	57.6	58.6
LZSmin	52.9	60.0	57.2	45.1	56.0	58.9	61.1	58.4	58.4	57.1	54.9	53.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	52.0	49.8	48.4	46.4	45.4	42.8	41.1	38.6	38.5	38.4	39.0	40.2
LZSmax	54.4	52.3	51.2	50.2	49.7	45.7	45.4	41.6	40.4	40.4	41.4	41.3
LZSmin	50.9	48.4	46.9	45.0	43.7	41.4	39.6	37.5	37.9	38.0	38.7	39.9

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	27 Jul 2013 17:53:07	-25.9
PRM831	27 Jul 2013 13:36:08	-25.6
PRM831	28 Apr 2013 15:34:24	-25.9
PRM831	23 Apr 2013 10:17:33	-25.0
PRM831	27 Feb 2013 19:15:30	-25.7
PRM831	24 Jan 2013 12:00:16	-25.6
PRM831	15 Jan 2013 07:50:44	-26.2
PRM831	04 Jan 2013 13:47:46	-26.5

General Information

Serial Number	02509
Model	831
Firmware Version	2.112
Filename	831_Data.002
User	GT
Job Description	Northwest Fresno Walmart Relocation
Location	Northwest Fresno Walmart
Measurement Description	
Start Time	Saturday, 2013 July 27 15:49:15
Stop Time	Saturday, 2013 July 27 16:09:15
Duration	00:20:00.6
Run Time	00:20:00.6
Pause	00:00:00.0
Pre Calibration	Saturday, 2013 July 27 13:36:08
Post Calibration	None
Calibration Deviation	---

Note

Located at the eastern portion of the southern parking lot and approx 140 feet south of the front door
96 F, 35% Humidity, 29.48 in Hg, 3 mph wind, partly cloudy

Overall Data

LAeq		63.1	dB
LASmax	2013 Jul 27 15:59:44	79.2	dB
LApeak (max)	2013 Jul 27 16:06:25	102.2	dB
LASmin	2013 Jul 27 15:50:20	49.6	dB
LCeq		74.0	dB
LAeq		63.1	dB
LCeq - LAeq		10.9	dB
LAIeq		67.4	dB
LAeq		63.1	dB
LAIeq - LAeq		4.3	dB
Ldn		63.1	dB
LDay 07:00-23:00		63.1	dB
LNight 23:00-07:00		---	dB
Lden		63.1	dB
LDay 07:00-19:00		63.1	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		93.9	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	66.7	dBA
LAS10.00	66.3	dBA
LAS33.30	62.8	dBA
LAS50.00	61.7	dBA
LAS66.60	57.7	dBA
LAS90.00	52.8	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	17 / 347.8	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.6	dB
Noise Floor	17.0	dB
Overload	143.1	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	66.7	66.1	71.1	71.6	64.9	59.5	59.6	58.3	56.2	51.8	46.8	44.6
LZSmax	82.6	84.9	82.2	89.3	77.1	67.1	72.4	76.6	76.6	69.0	67.7	63.1
LZSmin	46.5	55.4	53.6	59.0	55.2	49.9	45.5	43.6	40.9	37.7	39.6	42.8

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	63.6	61.5	59.8	58.7	60.7	63.4	67.2	66.6	65.3	65.7	67.5	67.2
LZSmax	80.9	76.9	73.6	75.5	79.8	83.7	80.9	76.8	78.9	83.8	87.4	88.8
LZSmin	37.3	40.3	43.7	45.3	48.2	51.5	55.9	60.4	54.9	53.2	57.5	47.0

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	61.7	61.0	54.9	52.9	57.0	53.2	57.3	54.1	52.1	54.5	53.3	52.7
LZSmax	76.0	71.0	69.8	65.8	64.6	65.6	67.0	71.0	67.1	65.9	72.9	73.0
LZSmin	52.1	48.8	46.7	42.4	46.2	44.6	43.2	38.5	38.6	39.0	39.4	38.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	52.5	50.9	50.7	49.0	46.4	44.5	43.0	41.7	41.1	40.0	39.6	40.0
LZSmax	75.9	69.6	63.7	63.8	64.4	64.7	63.3	62.7	62.7	60.8	57.9	52.5
LZSmin	37.2	35.4	34.6	33.1	32.6	32.8	33.6	34.7	35.9	36.7	37.7	39.4

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	27 Jul 2013 13:36:08	-25.6
PRM831	28 Apr 2013 15:34:24	-25.9
PRM831	23 Apr 2013 10:17:33	-25.0
PRM831	27 Feb 2013 19:15:30	-25.7
PRM831	24 Jan 2013 12:00:16	-25.6
PRM831	15 Jan 2013 07:50:44	-26.2
PRM831	04 Jan 2013 13:47:46	-26.5

File Translated: V:\Vista Env\2010\10022-Fresno Walmart\Noise Measurements\LD\15.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Revs: 4.283 / 3.120
Name:
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: slm&rta.ssa / SLM & Real-Time Analyzer
Location: 30' N of vendor truck loading area for Fresno Walmart
Note1: Approx 70' S of Locust Ave CL
Note2: 52F, 29.57 in Hg, 67% Humid., no wind, clear sky

Overall Any Data
Start Time: 19-May-2011 07:05:53
Elapsed Time: 00:08:30.5

	A Weight		C Weight		Flat	
Leq:	54.8 dBA		65.1 dBC		66.1 dBF	
SEL:	81.9 dBA		92.2 dBC		93.2 dBF	
Peak:	85.2 dBA		85.8 dBC		86.0 dBF	
	19-May-2011	07:09:58	19-May-2011	07:09:52	19-May-2011	07:09:52
Lmax (slow):	67.9 dBA		73.2 dBC		73.8 dBF	
	19-May-2011	07:09:50	19-May-2011	07:13:57	19-May-2011	07:13:57
Lmin (slow):	43.7 dBA		60.0 dBC		61.6 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:52	19-May-2011	07:06:51
Lmax (fast):	70.7 dBA		75.5 dBC		75.7 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (fast):	43.1 dBA		57.8 dBC		58.9 dBF	
	19-May-2011	07:11:17	19-May-2011	07:09:10	19-May-2011	07:09:10
Lmax (impulse):	72.1 dBA		76.8 dBC		77.1 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (impulse):	43.6 dBA		61.1 dBC		62.4 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:51	19-May-2011	07:09:10

Spectra

Date	Time	Run Time
19-May-2011	07:05:53	00:08:30.5

Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1	Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1
12.5	50.2		56.3		35.5		630	46.5		61.4		31.0	
16.0	50.9	55.5	56.1	61.5	37.1	41.8	800	45.4		60.8		30.5	
20.0	51.0		57.6		38.0		1000	44.5	49.3	56.1	63.9	31.7	35.6
25.0	55.8		57.5		41.1		1250	43.5		59.4		30.2	
31.5	57.7	61.6	57.1	63.3	46.2	49.9	1600	42.6		56.3		28.1	
40.0	56.7		60.3		46.3		2000	41.1	46.1	56.4	61.9	24.9	30.4
50.0	56.8		57.9		44.0		2500	40.0		58.4		21.7	
63.0	55.7	61.0	56.5	62.1	45.9	49.1	3150	40.2		60.8		19.4	
80.0	56.2		57.4		42.2		4000	39.5	43.8	58.6	63.4	18.7	24.1
100	55.6		55.1		42.3		5000	36.7		54.4		19.7	
125	54.3	59.2	59.0	63.8	40.7	45.7	6300	32.8		50.2		21.5	
160	52.8		61.0		39.4		8000	30.2	35.2	57.7	58.5	21.2	25.9
200	51.1		57.3		35.5		10000	25.4		41.5		20.5	
250	51.4	55.2	70.6	71.0	34.6	39.0	12500	22.9		32.2		19.4	
315	48.2		58.2		32.0		16000	20.8	26.5	27.4	33.9	19.1	24.4
400	47.0		59.0		30.1		20000	21.2		23.8		20.3	
500	47.0	51.6	64.3	66.9	30.4	35.3							

Ln Start Level: 15 dB

L1.00	0.0 dBA	L50.00	0.0 dBA	L95.00	0.0 dBA
L5.00	0.0 dBA	L90.00	0.0 dBA	L99.00	0.0 dBA

Detector: Slow
Weighting: A
SPL Exceedance Level 1: 85.0 dB Exceeded: 0 times
SPL Exceedance level 2: 120 dB Exceeded: 0 times
Peak-1 Exceedance Level: 105 dB Exceeded: 0 times
Peak-2 Exceedance Level: 100 dB Exceeded: 0 times
Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

File Translated: V:\Vista Env\2010\10022-Fresno Walmart\Noise Measurements\LD\15.slmdl
Model/Serial Number: 824 / A3176

Current Any Data
Start Time: 19-May-2011 07:05:53
Elapsed Time: 00:08:30.5

	A Weight		C Weight		Flat	
Leq:	54.8 dBA		65.1 dBC		66.1 dBF	
SEL:	81.9 dBA		92.2 dBC		93.2 dBF	
Peak:	85.2 dBA		85.8 dBC		86.0 dBF	
	19-May-2011	07:09:58	19-May-2011	07:09:52	19-May-2011	07:09:52
Lmax (slow):	67.9 dBA		73.2 dBC		73.8 dBF	
	19-May-2011	07:09:50	19-May-2011	07:13:57	19-May-2011	07:13:57
Lmin (slow):	43.7 dBA		60.0 dBC		61.6 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:52	19-May-2011	07:06:51
Lmax (fast):	70.7 dBA		75.5 dBC		75.7 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (fast):	43.1 dBA		57.8 dBC		58.9 dBF	
	19-May-2011	07:11:17	19-May-2011	07:09:10	19-May-2011	07:09:10
Lmax (impulse):	72.1 dBA		76.8 dBC		77.1 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (impulse):	43.6 dBA		61.1 dBC		62.4 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:51	19-May-2011	07:09:10

Calibrated: 18-May-2011 13:09:02 Offset: -48.2 dB
Checked: 19-May-2011 06:46:08 Level: 113.9 dB
Calibrator not set Level: 114.0 dB
Cal Records Count: 0

Interval Records: Disabled Number Interval Records: 0
History Records: Disabled Number History Records: 0
Run/Stop Records: Number Run/Stop Records: 2

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.001
User	GT
Job Description	Mobil at 104 N Coast Hwy Laguna Beach
Location	5 ft from Gas Station Air Compressor
Measurement Description	
Start Time	Friday, 2018 September 21 08:53:10
Stop Time	Friday, 2018 September 21 08:55:11
Duration	00:02:00.7
Run Time	00:02:00.7
Pause	00:00:00.0
Pre Calibration	Friday, 2018 September 21 08:51:58
Post Calibration	None
Calibration Deviation	---

Note

Noise from operational Air/Water Machine
67 F, 29.93 in Hg, 70% Hu, 2 mph wind, low clouds

Overall Data

LAeq		66.9	dB
LASmax	2018 Sep 21 08:53:27	73.6	dB
LApeak (max)	2018 Sep 21 08:53:23	92.0	dB
LASmin	2018 Sep 21 08:53:10	64.0	dB
LCeq		73.4	dB
LAeq		66.9	dB
LCeq - LAeq		6.5	dB
LAIeq		68.6	dB
LAeq		66.9	dB
LAIeq - LAeq		1.6	dB
Ldn		66.9	dB
LDay 07:00-22:00		66.9	dB
LNight 22:00-07:00		---	dB
Lden		66.9	dB
LDay 07:00-19:00		66.9	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		87.7	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	70.8	dBA
LAS10.00	68.3	dBA
LAS33.30	66.3	dBA
LAS50.00	66.0	dBA
LAS66.60	65.8	dBA
LAS90.00	65.4	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 118.3	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.6	dB
Noise Floor	16.9	dB
Overload	143.1	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	61.9	61.8	66.0	69.0	67.7	63.6	63.9	61.9	55.4	57.5	58.9	58.6
LZSmax	80.0	71.1	70.2	72.0	72.6	69.8	65.8	63.7	61.1	66.8	70.7	72.9
LZSmin	49.7	57.2	59.4	67.0	63.5	60.5	60.5	57.4	50.5	48.3	47.4	46.2

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	55.9	58.8	55.7	55.4	57.6	57.7	60.2	61.5	61.7	62.7	66.9	59.3
LZSmax	72.8	77.1	71.2	69.4	66.2	63.7	65.5	68.8	67.2	69.0	69.7	65.6
LZSmin	41.2	41.9	43.8	46.5	51.4	52.5	54.1	54.6	53.5	58.4	64.8	53.4

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	60.3	61.9	65.3	59.5	55.4	58.7	62.8	56.4	54.2	58.8	58.2	52.7
LZSmax	70.0	70.0	68.3	68.8	59.7	62.3	64.9	60.3	58.2	60.2	61.2	56.5
LZSmin	52.8	55.4	62.4	55.9	52.0	52.1	58.4	52.3	51.0	54.9	51.8	49.4

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	49.7	51.1	50.8	51.4	53.4	53.1	54.0	53.9	54.4	55.2	54.1	51.8
LZSmax	56.4	56.8	57.8	59.8	63.3	63.9	67.9	65.8	67.3	70.0	68.7	63.9
LZSmin	45.8	46.0	44.7	43.5	43.6	43.3	43.4	42.4	41.9	43.4	40.5	39.6

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	21 Sep 2018 08:51:56	-25.6
PRM831	05 Sep 2018 11:51:21	-25.9
PRM831	13 Jun 2018 13:02:21	-25.7
PRM831	30 Mar 2018 23:00:57	-25.2
PRM831	30 Mar 2018 12:23:25	-25.8
PRM831	07 Mar 2018 13:40:34	-25.8
PRM831	28 Feb 2018 12:16:10	-25.9
PRM831	30 Jan 2018 23:18:32	-26.2
PRM831	30 Jan 2018 13:42:45	-26.2
PRM831	30 Jan 2018 13:32:25	-26.0
PRM831	30 Jan 2018 10:54:43	-26.0

SLM & RTA Summary
Translated: 17-Aug-2010 14:31:20

File Translated: V:\Vista Env\2010\10021-Atascadero Walmart\Noise Measurements\1.slmdl
Model Number: 824
Serial Number: A3176
Firmware Rev: 4.283
Software Version: 3.120
Name:
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup: SLM&RTA.ssa
Setup Descr: SLM & Real-Time Analyzer
Location: Southern edge of gas station property
Note 1: 100' west of El Camino Real CL and 150' south of Del Rio Rd CL
Note 2: 78 F 28.97 HG 32% Humid. 2 MPH wind and clear sky

Overall Any Data
Start Time: 14-Aug-2010 12:03:04
Elapsed Time: 00:15:00.6

	A Weight		C Weight		Flat	
Leq:	61.7 dBA		74.5 dBC		75.3 dBF	
SEL:	91.2 dBA		104.0 dBC		104.8 dBF	
Peak:	105.2 dBA		108.2 dBC		110.1 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmax (slow):	73.4 dBA		88.4 dBC		90.8 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmin (slow):	49.4 dBA		63.1 dBC		64.6 dBF	
	14-Aug-2010 12:04:03		14-Aug-2010 12:04:03		14-Aug-2010 12:04:03	
Lmax (fast):	81.1 dBA		96.0 dBC		98.4 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmin (fast):	48.5 dBA		61.4 dBC		62.8 dBF	
	14-Aug-2010 12:04:02		14-Aug-2010 12:04:02		14-Aug-2010 12:04:02	
Lmax (impulse):	84.8 dBA		99.1 dBC		101.5 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmin (impulse):	48.7 dBA		63.7 dBC		65.4 dBF	
	14-Aug-2010 12:04:02		14-Aug-2010 12:04:03		14-Aug-2010 12:04:03	

Spectra
Start Time: 14-Aug-2010 12:03:04 Run Time: 00:15:00.6

Freq	Leq 1/3	Leq 1/1	Max 1/3	Max 1/1	Min 1/3	Min 1/1
12.5 Hz	55.3		72.2		36.3	
16.0 Hz	57.4	63.9	79.4	90.6	38.4	43.4
20.0 Hz	62.0		90.2		40.3	
25.0 Hz	65.1		93.7		43.9	
31.5 Hz	64.2	69.1	89.6	95.4	44.9	49.1
40.0 Hz	63.7		83.4		44.1	
50.0 Hz	67.7		88.2		46.6	
63.0 Hz	65.9	71.2	84.2	90.1	45.9	51.5
80.0 Hz	65.3		79.8		47.5	
100 Hz	65.0		76.4		46.3	
125 Hz	66.0	70.0	76.5	80.7	45.4	50.7
160 Hz	64.4		74.6		46.1	
200 Hz	59.6		70.5		41.9	
250 Hz	58.7	63.0	66.2	76.1	43.2	46.8
315 Hz	55.6		74.0		40.8	
400 Hz	53.6		75.8		39.0	
500 Hz	52.9	57.7	75.4	79.0	38.5	43.8
630 Hz	52.1		67.7		39.4	
800 Hz	52.5		68.9		40.2	
1000 Hz	51.8	56.3	69.8	73.4	39.2	43.6
1250 Hz	49.9		66.4		36.4	
1600 Hz	48.1		63.6		34.8	

2000 Hz	46.5	51.5	64.3	68.5	30.1	36.6
2500 Hz	45.1		63.2		27.3	
3150 Hz	44.3		62.5		25.2	
4000 Hz	42.5	47.6	58.5	64.6	22.9	28.2
5000 Hz	40.9		56.1		21.5	
6300 Hz	38.5		52.4		20.1	
8000 Hz	36.0	41.0	51.0	55.9	18.9	23.9
10000 Hz	31.8		49.3		18.3	
12500 Hz	27.9		46.0		18.0	
16000 Hz	24.5	30.9	36.7	46.6	19.1	24.2
20000 Hz	25.3		31.5		20.7	

Ln Start Level: 15 dB

L (1.00)	0.0
L (5.00)	0.0
L (50.00)	0.0
L (90.00)	0.0
L (95.00)	0.0
L (99.00)	0.0

Detector: Slow
Weighting: A

SPL Exceedance Level 1:	85.0 dB	Exceeded:	0 times
SPL Exceedance Level 2:	120.0 dB	Exceeded:	0 times
Peak-1 Exceedance Level:	105.0 dB	Exceeded:	1 times
Peak-2 Exceedance Level:	100.0 dB	Exceeded:	1 times

Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

Current Any Data
Start Time: 14-Aug-2010 12:03:04
Elapsed Time: 00:15:00.6

	A Weight	C Weight	Flat
Leq:	61.7 dBA	74.5 dBC	75.3 dBF
SEL:	91.2 dBA	104.0 dBC	104.8 dBF
Peak:	105.2 dBA	108.2 dBC	110.1 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmax (slow):	73.4 dBA	88.4 dBC	90.8 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmin (slow):	49.4 dBA	63.1 dBC	64.6 dBF
	14-Aug-2010 12:04:03	14-Aug-2010 12:04:03	14-Aug-2010 12:04:03
Lmax (fast):	81.1 dBA	96.0 dBC	98.4 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmin (fast):	48.5 dBA	61.4 dBC	62.8 dBF
	14-Aug-2010 12:04:02	14-Aug-2010 12:04:02	14-Aug-2010 12:04:02
Lmax (impulse):	84.8 dBA	99.1 dBC	101.5 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmin (impulse):	48.7 dBA	63.7 dBC	65.4 dBF
	14-Aug-2010 12:04:02	14-Aug-2010 12:04:03	14-Aug-2010 12:04:03

Calibrated:	14-Aug-2010 12:02:00	Offset:	-47.3 dB
Checked:	14-Aug-2010 12:02:00	Level:	93.3 dB
Calibrator	not set	Level:	114.0 dB
Cal Records Count:	0		

Interval Records:	Disabled	Number Interval Records:	0
Time History:	Disabled	Number History Records:	0
Run/Stop Records:		Number Run/Stop Records:	2

File Translated: C:\Vista Env\2008\080201 - Santa Rosa Lowes\Noise Measurements\LD\7.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Revs: 4.272 / 3.120
Name: Vista Environmental
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: slm&rta.ssa / SLM & Real-Time Analyzer
Location: 10' north of McDonalds drive thru speaker
Note1:
Note2:

Overall Any Data
Start Time: 03-Jun-2008 17:55:14
Elapsed Time: 00:12:12.1

	A Weight		C Weight		Flat	
Leq:	61.2 dBA		76.1 dBC		77.6 dBF	
SEL:	89.8 dBA		104.7 dBC		106.2 dBF	
Peak:	94.9 dBA		100.5 dBC		102.0 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48
Lmax (slow):	73.6 dBA		88.5 dBC		88.7 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (slow):	55.0 dBA		69.3 dBC		70.9 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	17:58:39	03-Jun-2008	18:00:37
Lmax (fast):	76.1 dBA		91.4 dBC		91.6 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (fast):	54.3 dBA		67.7 dBC		69.0 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	18:00:37	03-Jun-2008	18:00:37
Lmax (impulse):	79.2 dBA		92.1 dBC		93.8 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:03:31	03-Jun-2008	18:02:48
Lmin (impulse):	54.9 dBA		70.2 dBC		71.5 dBF	
	03-Jun-2008	17:59:21	03-Jun-2008	17:58:39	03-Jun-2008	18:00:36

Spectra

Date	Time	Run Time
03-Jun-2008	17:55:14	00:12:12.1

Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1	Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1
12.5	65.1		68.7		49.5		630	51.6		56.8		45.8	
16.0	65.1	69.5	65.9	71.8	53.1	57.1	800	51.2		55.0		45.4	
20.0	64.0		66.0		53.3		1000	50.9	55.5	54.4	59.4	45.6	50.1
25.0	68.9		65.4		57.8		1250	50.1		54.6		44.9	
31.5	68.1	73.5	65.6	70.5	57.7	62.3	1600	49.1		52.3		42.5	
40.0	69.1		66.2		57.1		2000	47.3	52.3	51.2	55.9	39.5	45.0
50.0	66.1		71.7		58.2		2500	45.6		49.5		37.0	
63.0	68.4	72.6	70.8	81.6	57.8	62.7	3150	44.1		48.7		34.1	
80.0	68.6		80.7		57.7		4000	42.1	47.3	46.5	51.4	32.6	37.4
100	66.7		73.7		56.0		5000	40.8		43.1		30.2	
125	66.6	70.3	86.6	87.8	53.1	58.6	6300	37.4		39.4		26.7	
160	61.7		81.0		50.6		8000	35.5	40.3	37.7	42.4	23.7	29.1
200	56.8		68.2		47.8		10000	32.2		34.6		20.7	
250	56.1	60.4	66.2	71.2	46.0	51.4	12500	29.5		31.3		13.3	
315	53.4		63.8		45.8		16000	26.1	31.9	28.1	33.5	12.7	18.9
400	52.2		62.6		45.9		20000	23.7		23.5		15.8	
500	52.1	56.7	56.8	64.4	46.2	50.7							

Ln Start Level: 15 dB

L1.00	0.0 dBA	L50.00	0.0 dBA	L95.00	0.0 dBA
L5.00	0.0 dBA	L90.00	0.0 dBA	L99.00	0.0 dBA

Detector: Slow
Weighting: A
SPL Exceedance Level 1: 85.0 dB Exceeded: 0 times
SPL Exceedance level 2: 120 dB Exceeded: 0 times
Peak-1 Exceedance Level: 105 dB Exceeded: 0 times
Peak-2 Exceedance Level: 100 dB Exceeded: 0 times
Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

File Translated: C:\Vista Env\2008\080201 - Santa Rosa Lowes\Noise Measurements\LD\7.slmdl
Model/Serial Number: 824 / A3176

Current Any Data
Start Time: 03-Jun-2008 17:55:14
Elapsed Time: 00:12:12.1

	A Weight		C Weight		Flat	
Leq:	61.2 dBA		76.1 dBC		77.6 dBF	
SEL:	89.8 dBA		104.7 dBC		106.2 dBF	
Peak:	94.9 dBA		100.5 dBC		102.0 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48
Lmax (slow):	73.6 dBA		88.5 dBC		88.7 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (slow):	55.0 dBA		69.3 dBC		70.9 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	17:58:39	03-Jun-2008	18:00:37
Lmax (fast):	76.1 dBA		91.4 dBC		91.6 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (fast):	54.3 dBA		67.7 dBC		69.0 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	18:00:37	03-Jun-2008	18:00:37
Lmax (impulse):	79.2 dBA		92.1 dBC		93.8 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:03:31	03-Jun-2008	18:02:48
Lmin (impulse):	54.9 dBA		70.2 dBC		71.5 dBF	
	03-Jun-2008	17:59:21	03-Jun-2008	17:58:39	03-Jun-2008	18:00:36

Calibrated: 03-Jun-2008 15:40:24 Offset: -47.5 dB
Checked: 03-Jun-2008 15:40:24 Level: 94.0 dB
Calibrator not set Level: 94.0 dB
Cal Records Count: 0

Interval Records: Disabled Number Interval Records: 0
History Records: Disabled Number History Records: 0
Run/Stop Records: Number Run/Stop Records: 2

APPENDIX E

FHWA Model Traffic Noise Contour Calculations

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: **Central Avenue (SR-74)** **Segment:** **East of Dexter Avenue**
Average Daily Traffic: 41100 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.02	-0.23	-1.20	74.3	71.5	70.7	66.6	74.1	74.58	70 dBA:	**136**	**146**
Medium Trucks	79.85	-8.57	-0.23	-1.20	69.9	54.8	53.4	53.1	59.7	60.00	65 dBA:	**293**	**315**
Heavy Trucks	83.81	-12.27	-0.23	-1.20	70.1	51.0	46.8	50.9	57.2	57.35	60 dBA:	**631**	**680**
				Total:	**76.7**	**71.6**	**70.8**	**66.9**	**74.3**	**74.8**	55 dBA:	**1358**	**1464**

Road Name: **Riverside Drive (SR-74)** **Segment:** **West of Gunnerson Street - Strickland Avenue**
Average Daily Traffic: 21020 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.49	0.50	-1.20	68.1	65.3	64.5	60.4	67.9	68.4	70 dBA:	**46**	**50**
Medium Trucks	76.31	-10.10	0.50	-1.20	65.5	50.4	49.0	48.7	55.4	55.7	65 dBA:	**100**	**107**
Heavy Trucks	81.16	-13.80	0.50	-1.20	66.7	47.5	43.4	47.4	53.8	53.9	60 dBA:	**214**	**231**
				Total:	**71.7**	**65.6**	**64.6**	**60.9**	**68.3**	**68.8**	55 dBA:	**462**	**497**

Road Name: **Riverside Drive (SR-74)** **Segment:** **East of Lakeshore Drive**
Average Daily Traffic: 21050 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.50	0.50	-1.20	68.2	65.4	64.5	60.4	67.9	68.4	70 dBA:	**46**	**50**
Medium Trucks	76.31	-10.09	0.50	-1.20	65.5	50.5	49.1	48.7	55.4	55.7	65 dBA:	**100**	**107**
Heavy Trucks	81.16	-13.79	0.50	-1.20	66.7	47.6	43.4	47.4	53.8	53.9	60 dBA:	**215**	**231**
				Total:	**71.7**	**65.6**	**64.6**	**60.9**	**68.3**	**68.8**	55 dBA:	**462**	**498**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 24180 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.10	1.55	-1.20	69.8	67.0	66.1	62.1	69.6	70.1	70 dBA:	**55**	**59**
Medium Trucks	76.31	-9.49	1.55	-1.20	67.2	52.1	50.7	50.4	57.1	57.3	65 dBA:	**118**	**127**
Heavy Trucks	81.16	-13.19	1.55	-1.20	68.3	49.2	45.0	49.1	55.4	55.5	60 dBA:	**254**	**273**
				Total:	**73.3**	**67.2**	**66.3**	**62.5**	**70.0**	**70.4**	55 dBA:	**547**	**588**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 14760 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.04	0.50	-1.20	66.6	63.8	63.0	58.9	66.4	66.9	70 dBA:	**36**	**39**
Medium Trucks	76.31	-11.64	0.50	-1.20	64.0	48.9	47.5	47.2	53.9	54.1	65 dBA:	**79**	**85**
Heavy Trucks	81.16	-15.34	0.50	-1.20	65.1	46.0	41.8	45.9	52.2	52.4	60 dBA:	**169**	**182**
				Total:	**70.1**	**64.0**	**63.1**	**59.3**	**66.8**	**67.2**	55 dBA:	**365**	**393**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 13760 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.30	-6.55	-1.20	59.3	56.9	55.6	49.6	58.0	58.7	70 dBA:	**25**	**28**
Medium Trucks	76.31	-15.17	-6.55	-1.20	53.4	34.2	26.4	35.6	41.8	41.8	65 dBA:	**55**	**60**
Heavy Trucks	81.16	-12.95	-6.55	-1.20	60.5	43.5	35.7	44.9	51.1	51.1	60 dBA:	**118**	**128**
				Total:	**63.4**	**57.2**	**55.7**	**51.0**	**58.9**	**59.4**	55 dBA:	**255**	**276**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 41360 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.05	-0.23	-1.20	74.3	71.5	70.7	66.6	74.1	74.6	70 dBA:	**136**	**147**
Medium Trucks	79.85	-8.54	-0.23	-1.20	69.9	54.8	53.4	53.1	59.8	60.0	65 dBA:	**294**	**317**
Heavy Trucks	83.81	-12.24	-0.23	-1.20	70.1	51.0	46.9	50.9	57.3	57.4	60 dBA:	**633**	**682**
				Total:	**76.7**	**71.7**	**70.8**	**66.9**	**74.3**	**74.8**	55 dBA:	**1364**	**1470**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 21290 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.55	0.50	-1.20	68.2	65.4	64.5	60.5	68.0	68.5	70 dBA:	**47**	**50**
Medium Trucks	76.31	-10.04	0.50	-1.20	65.6	50.5	49.1	48.8	55.4	55.7	65 dBA:	**100**	**108**
Heavy Trucks	81.16	-13.75	0.50	-1.20	66.7	47.6	43.4	47.5	53.8	53.9	60 dBA:	**216**	**233**
				Total:	**71.7**	**65.6**	**64.7**	**60.9**	**68.4**	**68.8**	55 dBA:	**466**	**501**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 21310 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.55	0.50	-1.20	68.2	65.4	64.5	60.5	68.0	68.5	70 dBA:	**47**	**50**
Medium Trucks	76.31	-10.04	0.50	-1.20	65.6	50.5	49.1	48.8	55.4	55.7	65 dBA:	**100**	**108**
Heavy Trucks	81.16	-13.74	0.50	-1.20	66.7	47.6	43.4	47.5	53.8	53.9	60 dBA:	**216**	**233**
				Total:	**71.7**	**65.6**	**64.7**	**60.9**	**68.4**	**68.8**	55 dBA:	**466**	**502**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 24300 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.12	1.55	-1.20	69.8	67.0	66.2	62.1	69.6	70.1	70 dBA:	**55**	**59**
Medium Trucks	76.31	-9.47	1.55	-1.20	67.2	52.1	50.7	50.4	57.1	57.3	65 dBA:	**118**	**127**
Heavy Trucks	81.16	-13.17	1.55	-1.20	68.3	49.2	45.1	49.1	55.5	55.6	60 dBA:	**255**	**274**
				Total:	**73.4**	**67.2**	**66.3**	**62.6**	**70.0**	**70.5**	55 dBA:	**548**	**590**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 16920 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.55	0.50	-1.20	67.2	64.4	63.5	59.5	67.0	67.5	70 dBA:	**40**	**43**
Medium Trucks	76.31	-11.04	0.50	-1.20	64.6	49.5	48.1	47.8	54.4	54.7	65 dBA:	**86**	**93**
Heavy Trucks	81.16	-14.74	0.50	-1.20	65.7	46.6	42.4	46.5	52.8	52.9	60 dBA:	**186**	**200**
				Total:	**70.7**	**64.6**	**63.7**	**59.9**	**67.4**	**67.8**	55 dBA:	**400**	**430**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 13860 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.27	-6.55	-1.20	59.3	57.0	55.7	49.6	58.1	58.7	70 dBA:	**26**	**28**
Medium Trucks	76.31	-15.14	-6.55	-1.20	53.4	34.2	26.4	35.6	41.8	41.8	65 dBA:	**55**	**60**
Heavy Trucks	81.16	-12.92	-6.55	-1.20	60.5	43.5	35.7	44.9	51.1	51.1	60 dBA:	**119**	**129**
				Total:	**63.4**	**57.2**	**55.7**	**51.0**	**58.9**	**59.5**	55 dBA:	**256**	**278**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 43590 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.28	-0.23	-1.20	74.6	71.8	70.9	66.8	74.3	74.8	70 dBA:	**141**	**152**
Medium Trucks	79.85	-8.32	-0.23	-1.20	70.1	55.0	53.6	53.3	60.0	60.3	65 dBA:	**304**	**328**
Heavy Trucks	83.81	-12.02	-0.23	-1.20	70.4	51.3	47.1	51.2	57.5	57.6	60 dBA:	**656**	**707**
				Total:	**77.0**	**71.9**	**71.0**	**67.1**	**74.6**	**75.1**	55 dBA:	**1413**	**1523**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 21890 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.67	0.50	-1.20	68.3	65.5	64.7	60.6	68.1	68.6	70 dBA:	**47**	**51**
Medium Trucks	76.31	-9.92	0.50	-1.20	65.7	50.6	49.2	48.9	55.6	55.8	65 dBA:	**102**	**110**
Heavy Trucks	81.16	-13.62	0.50	-1.20	66.8	47.7	43.6	47.6	54.0	54.1	60 dBA:	**220**	**237**
				Total:	**71.9**	**65.7**	**64.8**	**61.1**	**68.5**	**69.0**	55 dBA:	**475**	**511**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 21930 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.67	0.50	-1.20	68.3	65.5	64.7	60.6	68.1	68.6	70 dBA:	**48**	**51**
Medium Trucks	76.31	-9.92	0.50	-1.20	65.7	50.6	49.2	48.9	55.6	55.8	65 dBA:	**102**	**110**
Heavy Trucks	81.16	-13.62	0.50	-1.20	66.8	47.7	43.6	47.6	54.0	54.1	60 dBA:	**221**	**237**
				Total:	**71.9**	**65.7**	**64.8**	**61.1**	**68.5**	**69.0**	55 dBA:	**475**	**511**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 25190 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.28	1.55	-1.20	70.0	67.2	66.3	62.2	69.7	70.2	70 dBA:	**56**	**60**
Medium Trucks	76.31	-9.31	1.55	-1.20	67.4	52.3	50.9	50.6	57.2	57.5	65 dBA:	**121**	**130**
Heavy Trucks	81.16	-13.01	1.55	-1.20	68.5	49.4	45.2	49.3	55.6	55.7	60 dBA:	**261**	**281**
				Total:	**73.5**	**67.4**	**66.5**	**62.7**	**70.1**	**70.6**	55 dBA:	**562**	**605**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 15480 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.16	0.50	-1.20	66.8	64.0	63.2	59.1	66.6	67.1	70 dBA:	**38**	**41**
Medium Trucks	76.31	-11.43	0.50	-1.20	64.2	49.1	47.7	47.4	54.1	54.3	65 dBA:	**81**	**87**
Heavy Trucks	81.16	-15.13	0.50	-1.20	65.3	46.2	42.1	46.1	52.5	52.6	60 dBA:	**175**	**188**
				Total:	**70.3**	**64.2**	**63.3**	**59.6**	**67.0**	**67.4**	55 dBA:	**377**	**405**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 14350 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.12	-6.55	-1.20	59.5	57.1	55.8	49.8	58.2	58.8	70 dBA:	**26**	**28**
Medium Trucks	76.31	-14.99	-6.55	-1.20	53.6	34.4	26.6	35.8	42.0	42.0	65 dBA:	**56**	**61**
Heavy Trucks	81.16	-12.77	-6.55	-1.20	60.6	43.7	35.9	45.1	51.2	51.3	60 dBA:	**122**	**132**
				Total:	**63.6**	**57.3**	**55.9**	**51.2**	**59.1**	**59.6**	55 dBA:	**262**	**284**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 43850 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.30	-0.23	-1.20	74.6	71.8	70.9	66.8	74.4	74.9	70 dBA:	**142**	**153**
Medium Trucks	79.85	-8.29	-0.23	-1.20	70.1	55.1	53.7	53.4	60.0	60.3	65 dBA:	**306**	**329**
Heavy Trucks	83.81	-11.99	-0.23	-1.20	70.4	51.3	47.1	51.2	57.5	57.6	60 dBA:	**658**	**710**
				Total:	**77.0**	**71.9**	**71.0**	**67.2**	**74.6**	**75.1**	55 dBA:	**1418**	**1529**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 22160 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.72	0.50	-1.20	68.4	65.6	64.7	60.6	68.1	68.6	70 dBA:	**48**	**52**
Medium Trucks	76.31	-9.87	0.50	-1.20	65.7	50.7	49.3	49.0	55.6	55.9	65 dBA:	**103**	**111**
Heavy Trucks	81.16	-13.57	0.50	-1.20	66.9	47.8	43.6	47.7	54.0	54.1	60 dBA:	**222**	**239**
				Total:	**71.9**	**65.8**	**64.9**	**61.1**	**68.5**	**69.0**	55 dBA:	**479**	**515**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 22190 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.73	0.50	-1.20	68.4	65.6	64.7	60.6	68.1	68.6	70 dBA:	**48**	**52**
Medium Trucks	76.31	-9.86	0.50	-1.20	65.7	50.7	49.3	49.0	55.6	55.9	65 dBA:	**103**	**111**
Heavy Trucks	81.16	-13.57	0.50	-1.20	66.9	47.8	43.6	47.7	54.0	54.1	60 dBA:	**222**	**239**
				Total:	**71.9**	**65.8**	**64.9**	**61.1**	**68.5**	**69.0**	55 dBA:	**479**	**515**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 25310 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.30	1.55	-1.20	70.0	67.2	66.3	62.3	69.8	70.3	70 dBA:	**56**	**61**
Medium Trucks	76.31	-9.29	1.55	-1.20	67.4	52.3	50.9	50.6	57.3	57.5	65 dBA:	**121**	**131**
Heavy Trucks	81.16	-12.99	1.55	-1.20	68.5	49.4	45.2	49.3	55.6	55.7	60 dBA:	**262**	**282**
				Total:	**73.5**	**67.4**	**66.5**	**62.7**	**70.2**	**70.6**	55 dBA:	**564**	**606**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 17640 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.73	0.50	-1.20	67.4	64.6	63.7	59.6	67.1	67.6	70 dBA:	**41**	**44**
Medium Trucks	76.31	-10.86	0.50	-1.20	64.7	49.7	48.3	48.0	54.6	54.9	65 dBA:	**89**	**95**
Heavy Trucks	81.16	-14.56	0.50	-1.20	65.9	46.8	42.6	46.7	53.0	53.1	60 dBA:	**191**	**205**
				Total:	**70.9**	**64.8**	**63.9**	**60.1**	**67.5**	**68.0**	55 dBA:	**411**	**442**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 14450 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.09	-6.55	-1.20	59.5	57.2	55.9	49.8	58.2	58.9	70 dBA:	**26**	**29**
Medium Trucks	76.31	-14.96	-6.55	-1.20	53.6	34.4	26.6	35.8	42.0	42.0	65 dBA:	**57**	**62**
Heavy Trucks	81.16	-12.74	-6.55	-1.20	60.7	43.7	35.9	45.1	51.3	51.3	60 dBA:	**122**	**133**
				Total:	**63.6**	**57.4**	**55.9**	**51.2**	**59.1**	**59.6**	55 dBA:	**263**	**285**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**
Average Daily Traffic: 62140 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	4.82	-0.23	-1.20	76.1	73.3	72.5	68.4	75.9	76.4	70 dBA:	**179**	**193**
Medium Trucks	79.85	-6.78	-0.23	-1.20	71.7	56.6	55.2	54.9	61.5	61.8	65 dBA:	**386**	**416**
Heavy Trucks	83.81	-10.48	-0.23	-1.20	71.9	52.8	48.6	52.7	59.0	59.1	60 dBA:	**831**	**895**
				Total:	**78.5**	**73.4**	**72.6**	**68.7**	**76.1**	**76.6**	55 dBA:	**1789**	**1929**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**
Average Daily Traffic: 31270 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.22	0.50	-1.20	69.9	67.1	66.2	62.1	69.6	70.1	70 dBA:	**60**	**65**
Medium Trucks	76.31	-8.38	0.50	-1.20	67.2	52.2	50.8	50.5	57.1	57.4	65 dBA:	**130**	**140**
Heavy Trucks	81.16	-12.08	0.50	-1.20	68.4	49.3	45.1	49.2	55.5	55.6	60 dBA:	**279**	**301**
				Total:	**73.4**	**67.3**	**66.4**	**62.6**	**70.0**	**70.5**	55 dBA:	**602**	**648**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**
Average Daily Traffic: 31350 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.23	0.50	-1.20	69.9	67.1	66.2	62.1	69.6	70.1	70 dBA:	**60**	**65**
Medium Trucks	76.31	-8.36	0.50	-1.20	67.2	52.2	50.8	50.5	57.1	57.4	65 dBA:	**130**	**140**
Heavy Trucks	81.16	-12.06	0.50	-1.20	68.4	49.3	45.1	49.2	55.5	55.6	60 dBA:	**280**	**301**
				Total:	**73.4**	**67.3**	**66.4**	**62.6**	**70.0**	**70.5**	55 dBA:	**603**	**649**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 29840 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.01	1.55	-1.20	70.7	67.9	67.1	63.0	70.5	71.0	70 dBA:	**63**	**68**
Medium Trucks	76.31	-8.58	1.55	-1.20	68.1	53.0	51.6	51.3	58.0	58.2	65 dBA:	**136**	**146**
Heavy Trucks	81.16	-12.28	1.55	-1.20	69.2	50.1	46.0	50.0	56.4	56.5	60 dBA:	**292**	**314**
				Total:	**74.3**	**68.1**	**67.2**	**63.5**	**70.9**	**71.4**	55 dBA:	**629**	**677**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 17900 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.79	0.50	-1.20	67.5	64.7	63.8	59.7	67.2	67.7	70 dBA:	**42**	**45**
Medium Trucks	76.31	-10.80	0.50	-1.20	64.8	49.7	48.3	48.0	54.7	55.0	65 dBA:	**89**	**96**
Heavy Trucks	81.16	-14.50	0.50	-1.20	66.0	46.8	42.7	46.7	53.1	53.2	60 dBA:	**193**	**207**
				Total:	**71.0**	**64.9**	**63.9**	**60.2**	**67.6**	**68.1**	55 dBA:	**415**	**447**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 16810 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.57	-6.55	-1.20	60.2	57.8	56.5	50.5	58.9	59.5	70 dBA:	**29**	**32**
Medium Trucks	76.31	-14.30	-6.55	-1.20	54.3	35.1	27.3	36.5	42.6	42.7	65 dBA:	**63**	**68**
Heavy Trucks	81.16	-12.08	-6.55	-1.20	61.3	44.3	36.6	45.8	51.9	52.0	60 dBA:	**135**	**147**
				Total:	**64.3**	**58.0**	**56.6**	**51.9**	**59.8**	**60.3**	55 dBA:	**291**	**316**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 62400 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	4.83	-0.23	-1.20	76.1	73.3	72.5	68.4	75.9	76.4	70 dBA:	**179**	**193**
Medium Trucks	79.85	-6.76	-0.23	-1.20	71.7	56.6	55.2	54.9	61.5	61.8	65 dBA:	**387**	**417**
Heavy Trucks	83.81	-10.46	-0.23	-1.20	71.9	52.8	48.7	52.7	59.1	59.2	60 dBA:	**833**	**898**
				Total:	**78.5**	**73.5**	**72.6**	**68.7**	**76.1**	**76.6**	55 dBA:	**1794**	**1934**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 31540 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.25	0.50	-1.20	69.9	67.1	66.2	62.2	69.7	70.2	70 dBA:	**61**	**65**
Medium Trucks	76.31	-8.34	0.50	-1.20	67.3	52.2	50.8	50.5	57.2	57.4	65 dBA:	**130**	**140**
Heavy Trucks	81.16	-12.04	0.50	-1.20	68.4	49.3	45.1	49.2	55.5	55.6	60 dBA:	**281**	**302**
				Total:	**73.4**	**67.3**	**66.4**	**62.6**	**70.1**	**70.5**	55 dBA:	**606**	**652**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 31610 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.26	0.50	-1.20	69.9	67.1	66.3	62.2	69.7	70.2	70 dBA:	**61**	**65**
Medium Trucks	76.31	-8.33	0.50	-1.20	67.3	52.2	50.8	50.5	57.2	57.4	65 dBA:	**131**	**141**
Heavy Trucks	81.16	-12.03	0.50	-1.20	68.4	49.3	45.2	49.2	55.6	55.7	60 dBA:	**281**	**303**
				Total:	**73.4**	**67.3**	**66.4**	**62.7**	**70.1**	**70.5**	55 dBA:	**606**	**653**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 29960 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.03	1.55	-1.20	70.7	67.9	67.1	63.0	70.5	71.0	70 dBA:	**63**	**68**
Medium Trucks	76.31	-8.56	1.55	-1.20	68.1	53.0	51.6	51.3	58.0	58.2	65 dBA:	**136**	**146**
Heavy Trucks	81.16	-12.26	1.55	-1.20	69.2	50.1	46.0	50.0	56.4	56.5	60 dBA:	**293**	**315**
				Total:	**74.3**	**68.1**	**67.2**	**63.5**	**70.9**	**71.4**	55 dBA:	**631**	**679**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 20060 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.29	0.50	-1.20	67.9	65.1	64.3	60.2	67.7	68.2	70 dBA:	**45**	**48**
Medium Trucks	76.31	-10.30	0.50	-1.20	65.3	50.2	48.8	48.5	55.2	55.5	65 dBA:	**96**	**104**
Heavy Trucks	81.16	-14.00	0.50	-1.20	66.5	47.3	43.2	47.2	53.6	53.7	60 dBA:	**208**	**224**
				Total:	**71.5**	**65.4**	**64.4**	**60.7**	**68.1**	**68.6**	55 dBA:	**448**	**482**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 16910 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.59	-6.55	-1.20	60.2	57.8	56.5	50.5	58.9	59.5	70 dBA:	**29**	**32**
Medium Trucks	76.31	-14.27	-6.55	-1.20	54.3	35.1	27.3	36.5	42.7	42.7	65 dBA:	**63**	**68**
Heavy Trucks	81.16	-12.05	-6.55	-1.20	61.4	44.4	36.6	45.8	51.9	52.0	60 dBA:	**136**	**147**
				Total:	**64.3**	**58.0**	**56.6**	**51.9**	**59.8**	**60.3**	55 dBA:	**292**	**317**

Appendix K

Traffic Impact Study

Traffic Impact Study

KASSAB TRAVEL CENTER
CITY OF LAKE ELSINORE, CA

Prepared for:
Sagecrest Planning+Environmental

April 17, 2018
revised August 31, 2018

Prepared by:

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Executive Summary

This section provides an executive summary of the Traffic Impact Study through a set of frequently asked questions (FAQs).

Where is the project located and what would be developed?

The proposed project is located at 29301 Riverside Drive (northwest corner of Collier Avenue/Riverside Drive) in the City of Lake Elsinore in Riverside County (County). The proposed project is proposing an 18 fueling position gas station with convenience mart, and a 2,540 square foot fast-food restaurant with a drive-through.

What existing public streets will serve the project and where is access proposed?

A full access driveway on Collier Avenue and one right turn in/out restricted driveway on Riverside Drive (SR-74) would provide access to the project. The project will restripe the southbound approach at Collier Avenue/Riverside Drive (SR-74) to consist of one right lane and one shared-left lane in order to construct an additional northbound left-turn lane for the Collier Avenue driveway. Regional access would be provided by the I-15 freeway via interchanges at Nichols Road and Central Avenue (SR-74).

Is the site currently served by public transit?

The project site is served by RTA Route 8 and 22. A bus stop is located on the northeast corner of Collier Avenue/Riverside Drive. There is weekday and weekend service along Collier Avenue.

How many daily vehicular trips would the project generate and when would peak traffic volumes occur?

The proposed project is proposing an 18 fueling position gas station with convenience mart, and a 2,540 square foot fast-food restaurant with a drive-through. This project is expected to generate a net of 1,919 daily trips, 129 AM peak hour trips (65 inbound and 64 outbound), and 148 PM peak hour trips (75 inbound and 73 outbound).

What Transportation impacts are anticipated, if any?

The following intersections are forecast to be impacted under the Existing plus Project condition:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The following intersections are forecast to be impacted under the Existing plus Ambient Growth plus Project condition:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The following intersections are forecast to be impacted under the Existing plus Ambient Growth plus Project plus Cumulative Projects condition:

- I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
- Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)
- Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
- I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
- Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

What measures are proposed to reduce or control traffic impacts?

The following mitigation measures are recommended to improve the LOS at impacted intersections. These mitigation measures are applicable to the Existing plus Project scenario:

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during the PM peak hour.

The following mitigation measures are recommended to improve the LOS at impacted intersections. These mitigation measures are applicable to the Existing plus Ambient Growth plus Project scenario:

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS B during the PM peak hour.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the PM peak hour.

The following mitigation measures are recommended to improve the LOS at impacted intersections. These mitigation measures are applicable to the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario:

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the AM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during both the AM and PM.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS C during the PM peak hour.
- Collier Avenue (SR-74)/Riverside Drive (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Restripe two southbound approach lanes to one southbound through-left and one southbound through-right lane. With this mitigation, the intersection is forecast to operate at LOS D during both the AM and PM peak hour.
- I-15 SB Ramps/Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Install a third eastbound through lane and install a second (dual) southbound left turn lane. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Dexter Avenue /Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Change northbound left turn phasing to protected-permitted. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour.

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.
- The project's fair share percentages range from 0.9 percent through 12.5 percent for the intersection improvements discussed above.
- All roadway segments operate at LOS D or better and would operate within the City's standard of LOS D, except for Riverside Drive (SR-74), west of Collier Avenue. This segment is currently operating at LOS E-F under existing conditions, and is forecast to continue to operate at LOS E-F under Existing plus Ambient Growth plus Project conditions, as well as with the addition of traffic from cumulative projects (Existing plus Ambient Growth plus Project plus Cumulative Projects). Collier Avenue, south of Riverside Drive (SR-74) in the Existing plus Ambient Growth plus Project plus Cumulative Projects condition is forecast to degrade to LOS F with the addition of Cumulative Project traffic.

  Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

  The roadway segment of Riverside Drive, west of Collier Avenue is part of the TUMF network and is to be improved to its ultimate width using those funds. However, with the project improvements listed above, and the addition of project traffic (approximately 540 ADT), this segment of Riverside Drive (SR-74) is forecast to continue to operate at LOS E-F under both conditions. The project's fair share percentage for the roadway segment of Riverside Drive (SR-74), west of Collier Avenue would be 5.2 percent. Collier Avenue, south of Riverside Drive (SR-74), with the addition of project traffic (approximately 1,056 ADT), this segment of Collier Avenue (SR-74) is forecast to continue to operate LOS E-F under Existing plus Ambient Growth plus Project conditions. The project's fair share percentage for the roadway segment of Collier Avenue, south of Riverside Drive (SR-74) would be 9.6 percent.

Chapter 1. Introduction

The purpose of this traffic impact study (TIS) is to identify potential traffic-related impacts associated with the proposed Kassab Travel Center (proposed project), located at 29301 Riverside Drive (northwest corner of Collier Avenue/Riverside Drive) in the City of Lake Elsinore (City) in Riverside County (County). As necessary, and if required, mitigation measures will be identified to offset or reduce significant impacts.

This TIS has been prepared consistent with the requirements of the Riverside County Transportation Department *Traffic Impact Analysis Preparation Guide* (April 2008) and the City of Lake Elsinore General Plan. A *Scoping Agreement for Traffic Impact Study* has been submitted to, and approved, by the City Traffic Engineer, and is provided as an attachment to this TIS in Appendix A.

Figure 1 illustrates the project site location and the project study area.

Project Description

The project proposes to construct an 18 pump gas station with an 8,360 square foot (SF) convenience store containing two quick serve restaurants; and, a 2,543 SF fast food restaurant with drive through. Access to the project site would be via one driveway off Collier Avenue and one driveway off Riverside Drive. The project site plan is provided in Figure 2.

The current General Plan designation of the site is Limited Industrial and the site is zoned as Commercial Manufacturing. The proposed land use is Commercial with the proposed zoning as Commercial Manufacturing.

Pedestrian facilities, in the form of sidewalks, are proposed along the project's frontages on Collier Avenue and Riverside Drive. These sidewalks are shown to be 5 feet in width on Collier Avenue and 6 feet in width on Riverside Drive; and, will be constructed to be consistent with Caltrans and the City's Standard Plans. The proposed sidewalk on the west side of Collier Avenue would connect to the existing sidewalk north of the project site, which provides continuous pedestrian access to the adjacent retail and industrial uses, including the Outlets at Lake Elsinore, further to the north. The proposed sidewalk on the north side of Riverside Drive would be constructed just along the project frontage, as there are no other existing pedestrian facilities to connect with west of the project site.

Collier Avenue and Riverside Drive Improvements

Per the City's General Plan Roadway Classifications (Figure 2.3 of General Plan), Collier Avenue, north of Riverside Drive (along the project's frontage), is classified as a Major roadway with four lanes and a 100 foot right-of-way (80 feet, curb-to-curb). Riverside Drive (SR-74), west of Collier Avenue (along the project's frontage), is classified as an Urban Arterial with six lanes and a 120 foot right-of-way (96 feet, curb-to-curb). Figure 3, illustrates the street cross sections for a Major roadway and Urban Arterial.

The project will restripe the southbound approach at Collier Avenue/Riverside Drive (SR-74) to consist of one right lane and one shared-left lane in order to construct an additional northbound left-turn lane for the Collier Avenue driveway. Therefore, all project scenarios incorporate this alteration in geometrics. Figure 2 illustrates this change in access.

Currently, Collier Avenue, along the project's frontage, is not constructed to its ultimate Major roadway width of 80 feet, curb-to-curb. It is approximately 76 feet, curb-to-curb. Based on review of the project site plan, the proposed project will dedicate approximately 10 feet in order to allow their half-section of Collier Avenue to be consistent with the Major roadway

(half) cross section (center median, two travel lanes, six foot bike lane, and 5 foot sidewalk – in one direction). Street improvements on the west side of Collier Avenue, along the project's frontage, will conform with City roadway design standards.

- Widened roadway, with curb-and-gutter, on the west side of the centerline to include:
  - Widened sidewalk/landscape/parkway from six feet to 10 feet
  - New six foot wide bike lane (Class II – striped, on-pavement)

These improvements will be constructed to be consistent with the General Plan and the City's Standard Plans.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). With the street dedication on the north side (project frontage), the pavement width would be approximately 74 feet (48 feet from curb face to new centerline, plus 26 feet of existing pavement on the south side of the street). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

Study Area and Scope

Per the Scoping Agreement, this analysis focuses on the weekday AM (7:00 to 9:00 AM) peak period and the PM (4:00 to 6:00 PM) peak period. These periods represent the highest cumulative total traffic for the adjacent street system. The study intersections include:

1. I-15 NB ramps/Nichols Road
2. I-15 SB ramps/Nichols Road
3. Collier Avenue/Nichols Road
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)
5. Collier Avenue (SR-74)/Hunco Way
6. Collier Avenue (SR-74)/Central Avenue (SR-74)
7. I-15 SB ramps/Central Avenue (SR-74)
8. I-15 NB ramps/Central Avenue (SR-74)
9. Dexter Avenue/Central Avenue (SR-74)
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)
11. Lakeshore Drive/Riverside Drive (SR-74)

The study roadway segments include:

- Riverside Drive (SR-74), west of Collier Avenue
- Collier Avenue, north of Riverside Drive (SR-74)
- Collier Avenue, south of Riverside Drive (SR-74)

The study intersections were analyzed for the following scenarios:

- Existing Condition
- Existing plus Project
- Existing plus Ambient Growth plus Project
- Existing plus Ambient Growth plus Project plus Cumulative Projects

This TIS includes a description of existing conditions in the site vicinity, including roadway network, existing and future weekday AM and PM peak hour traffic volumes, and traffic operations.

Methodology

Signalized intersections. The operational characteristics of an intersection are determined by calculating the intersection's level of service (LOS). The intersection as a whole and its individual turning movements can be described alphabetically with a range of levels of service (A through F), with LOS A indicating free-flow traffic and LOS F indicating extreme congestion and long vehicle delays. At signalized intersections, LOS was calculated using the *Highway Capacity Manual 2010* (HCM) methodology. LOS at signalized intersections is measured based on the average vehicle delay of all of the movements. The *Synchro/ SimTraffic* (version 10) software was utilized to analyze intersection delay, LOS, and queues. The *Synchro/SimTraffic* software is consistent with HCM methodologies. Table 1 shows the relationship between v/c ratio and LOS for signalized intersections.

Table 1. Level of Service Criteria for Signalized Intersections using HCM Methodology

Level of Service	Average Control Delay	General Description (Signalized Intersections)
A	0.0 – 10.0 seconds	Free Flow
B	10.1 – 20.0 seconds	Stable Flow (slight delays)
C	20.1 – 35.0 seconds	Stable flow (acceptable delays)
D	35.1 to 55.0 seconds	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	55.1 to 80.0 seconds	Unstable flow (intolerable delay)
F	80.1 seconds or greater	Forced flow (jammed)

Unsignalized intersections. LOS at unsignalized intersections is classified by two intersection types: all-way stop-controlled and two-way stop-controlled. LOS for unsignalized intersections was also calculated using the *Synchro/SimTraffic* LOS software which is consistent with HCM methodology. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2 shows the relationship between vehicle delay and LOS for unsignalized intersections (both all-way and two-way, stop-controlled).

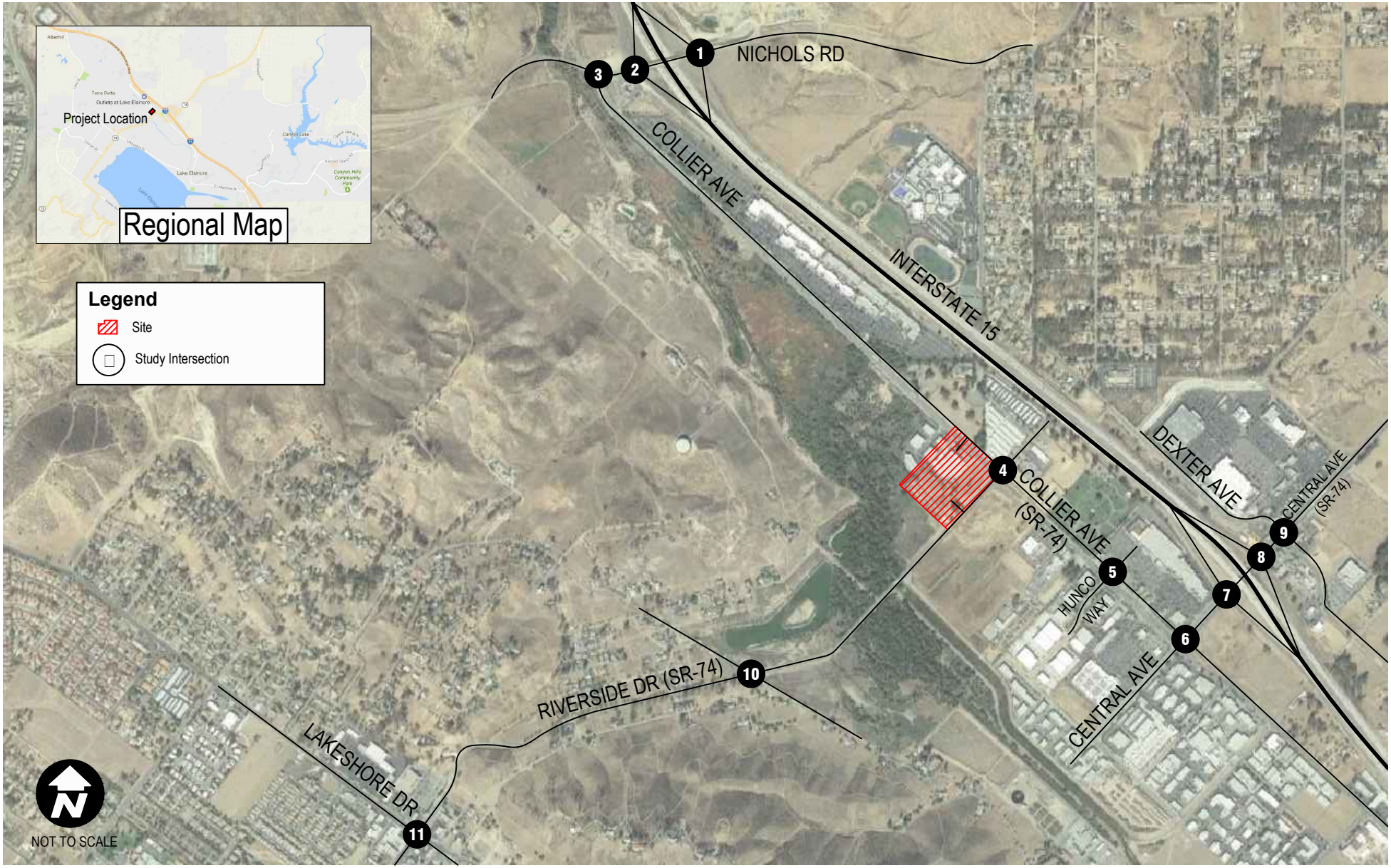
Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Two-Way and All-Way Stop Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

Source: *Highway Capacity Manual*, Transportation Research Board, 2010.

Future Traffic Forecasts. Existing plus Ambient Growth plus Project volumes were determined by adding a growth rate of two (2) percent per year to the existing traffic volumes as directed by the City staff. Existing plus Ambient Growth plus Project plus Cumulative Projects traffic volumes were determined by adding traffic from cumulative (approved and/or pending) projects to the Existing plus Ambient Growth plus Project scenario.

Significance Criteria. According to the City's General Plan Circulation Element, the worst acceptable level of service for study area intersections would be LOS D. Facilities operating at, or are forecast to operate at, LOS E or F would be considered deficient.



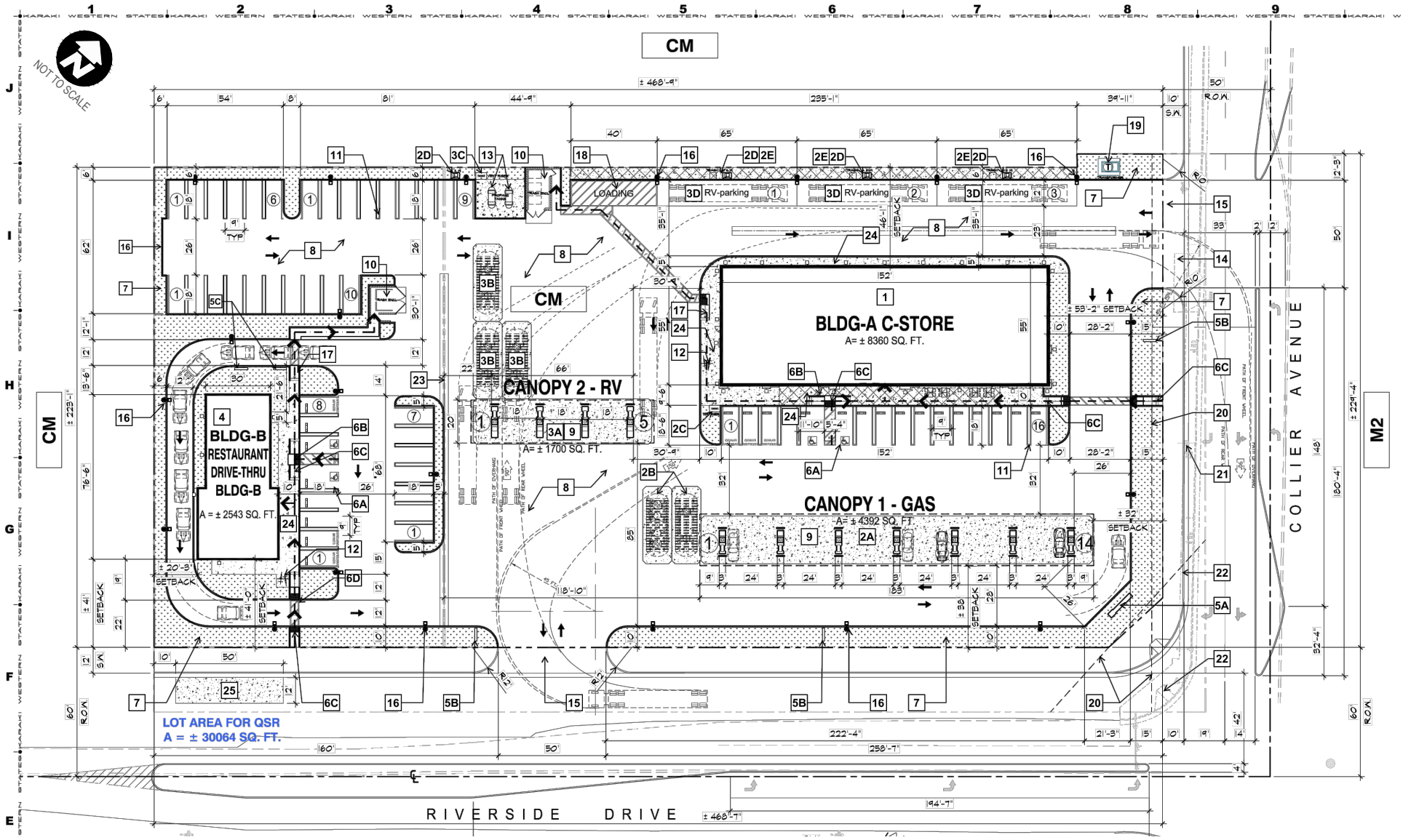
Source: Google Maps, 10/2016

Project Site Location and Stud□ □rea

FIGURE
1

Kassab Travel Center TIA

Jun 13, 2018 - 9:38am mpopovic P:\300.Environmental\Kassab Travel Center\Graphics\Base_KassabTravelCenter2.dwg Layout: Fig1-StudyArea

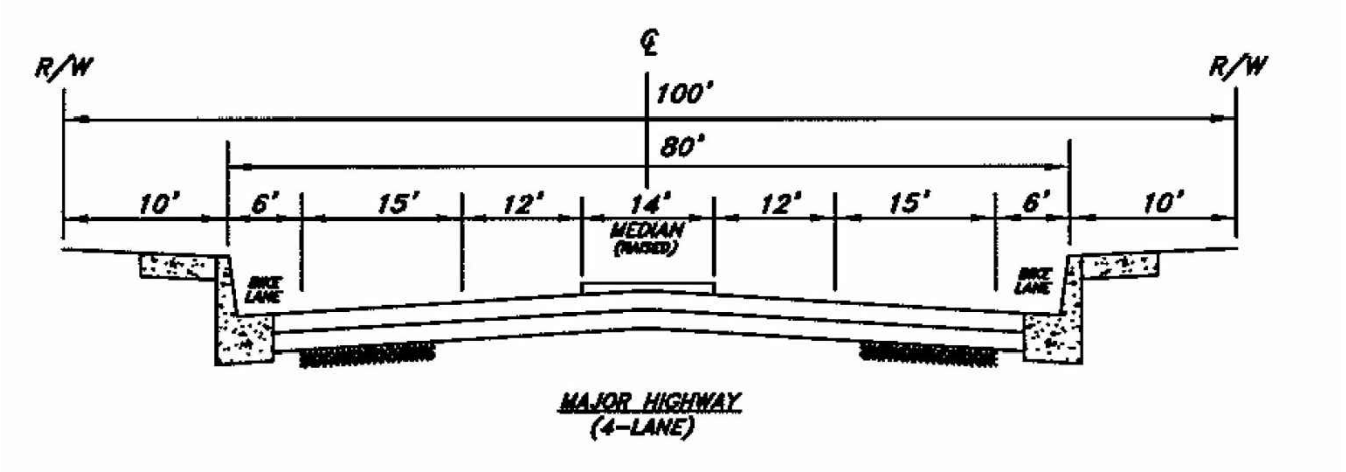


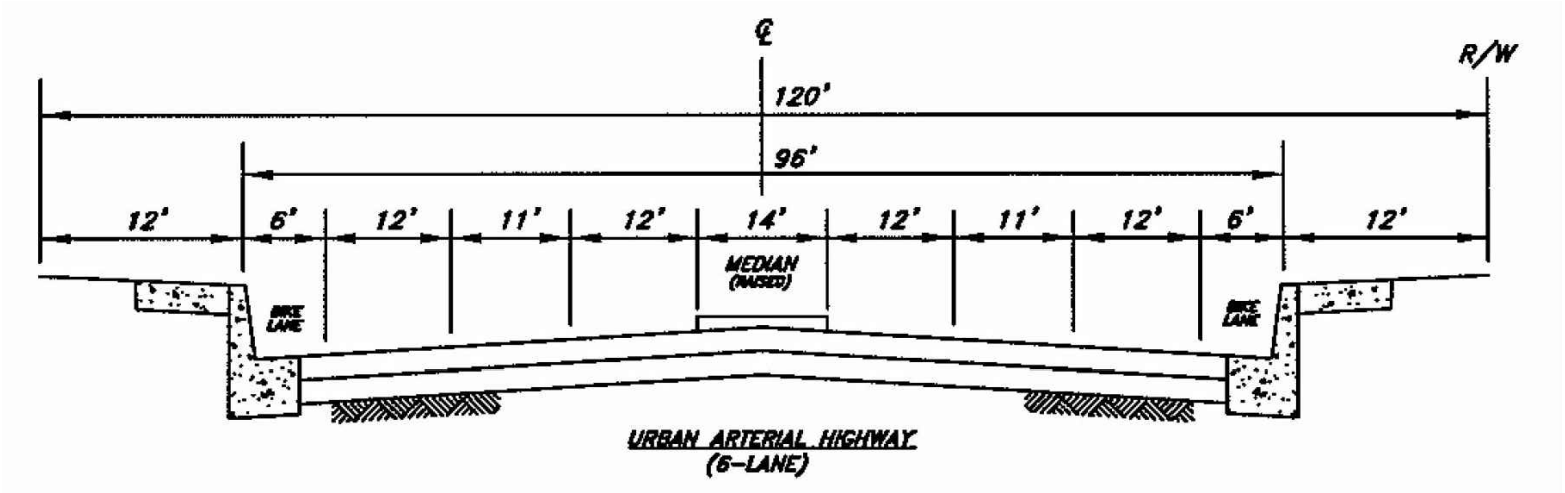
Source: Western States Engineering,05/31/18

Project Site Plan

FIGURE
2

Kassab Travel Center TIA





Source: City of Lake Elsinore Street Cross Sections Standard Plan No. 100C.

Street Cross Sections

FIGURE
3

Kassab Travel Center TIA

Chapter 2. Project Traffic Characteristics

Trip Generation

As noted previously in Chapter 1, the proposed project is an 18 fueling position gas station with an 8,360 square foot (SF) convenience store containing two quick serve restaurants; and, a 2,543 SF fast food restaurant with drive through. The trip generation for the project was calculated using trip rates from the Institute of Transportation Engineers' *Trip Generation, 9th Edition* (ITE 2012).

Pass-by trip reductions for retail uses allow for a reduction of project trips at all offsite intersections as it assumes that existing and/or baseline (background) traffic, already traveling on the street network, would deviate from their pattern and create a pass-by trip to a retail use. For example, a driver that is already traveling from his office, back to his home (which is called the "primary" trip), may now decide to pass-by a retail use (e.g., to purchase goods or food, or utilize services, like banks or gas stations) now that this use is on his way home. At that point, his existing trip through the street network is now a pass-by trip to the retail use, and not a creation of a new trip on the street network by the retail use. Pass-by trip reduction percentages were researched in ITE's *Trip Generation Manual* for the project's retail uses. The project trip generation calculations are shown in Table 3.

Table 3. Kassab Travel Center Trip Generation Estimates

				AM Peak Hour			PM Peak Hour		
Land Use		**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
Fast-Food Restaurant with Drive-Through Window [1]		TSF	496.12	23.16	22.26	45.42	16.98	15.67	32.65
Gasoline/Service Station with Convenience Market [2]		VFP	162.78	5.08	5.08	10.16	6.76	6.76	13.51
Project Trip Generation									
Fast-Food Restaurant with Drive-Through Window	2.54	TSF	1,260	59	57	115	43	40	83
Passby (49% AM/Daily, 50% PM) [3]			-630	-29	-28	-57	-22	-20	-41
NET			630	30	29	59	22	20	41
Gas Station & Convenience Market	18	VFP	2,930	91	91	183	122	122	243
Passby (62% AM/Daily, 56% PM) [3]			-1,641	-57	-57	-113	-68	-68	-136
NET			1,289	35	35	69	53	53	107
Total Trip Generation			4,190	150	148	298	165	161	326
NET Trip Generation			1,919	65	64	129	75	73	148

TSF = Thousand Square Feet, VFP = Vehicle Fueling Positions

[1] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 934 - Fast-Food Restaurant with Drive-Through Window.

[2] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 945 - Gasoline/Service Station with Convenience Market

[3] Pass-by percentages based on rates/equations obtained from the Trip Generation Handbook, 2nd Edition, ITE, 2004.

As shown in Table 3, the proposed project would generate a total of 4,190 daily trips, 298 AM peak hour trips, and 326 PM peak hour trips. With the application of pass-by trip reductions, the project would generate a net total of approximately 1,919 daily trips, 129 AM peak hour trips, and 148 PM peak hour trips.

Trip Distribution and Assignment

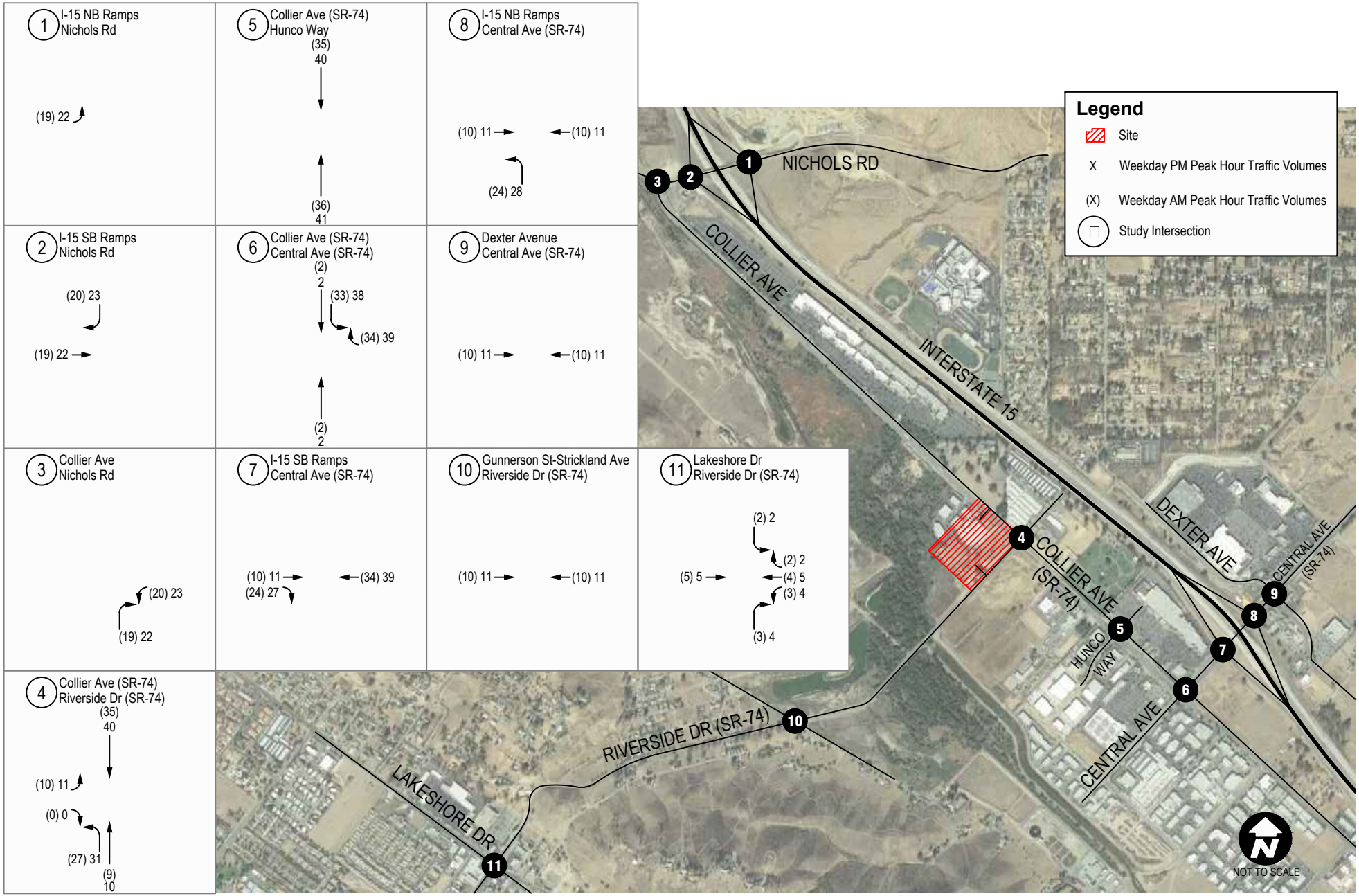
Based on the location of the project, it is likely that most project trips would utilize the freeway ramps at Nichols Road and Central Avenue to travel on Interstate 15. Other project traffic would be distributed through Central Avenue and Riverside Drive. The project's trip distribution is shown in Figure 4. The resulting project trip assignment is shown on Figure 5. In addition, the project driveway trip assignment, detailing the total trip generation at driveways, is shown in Figure 6. Pass-by trip information is provided in Figure 7, detailing inbound and outbound pass-by trips.

Source: Google Maps, 10/2016

Project Trip Distri□ution

FIGURE
4

Kassab Travel Center TIA

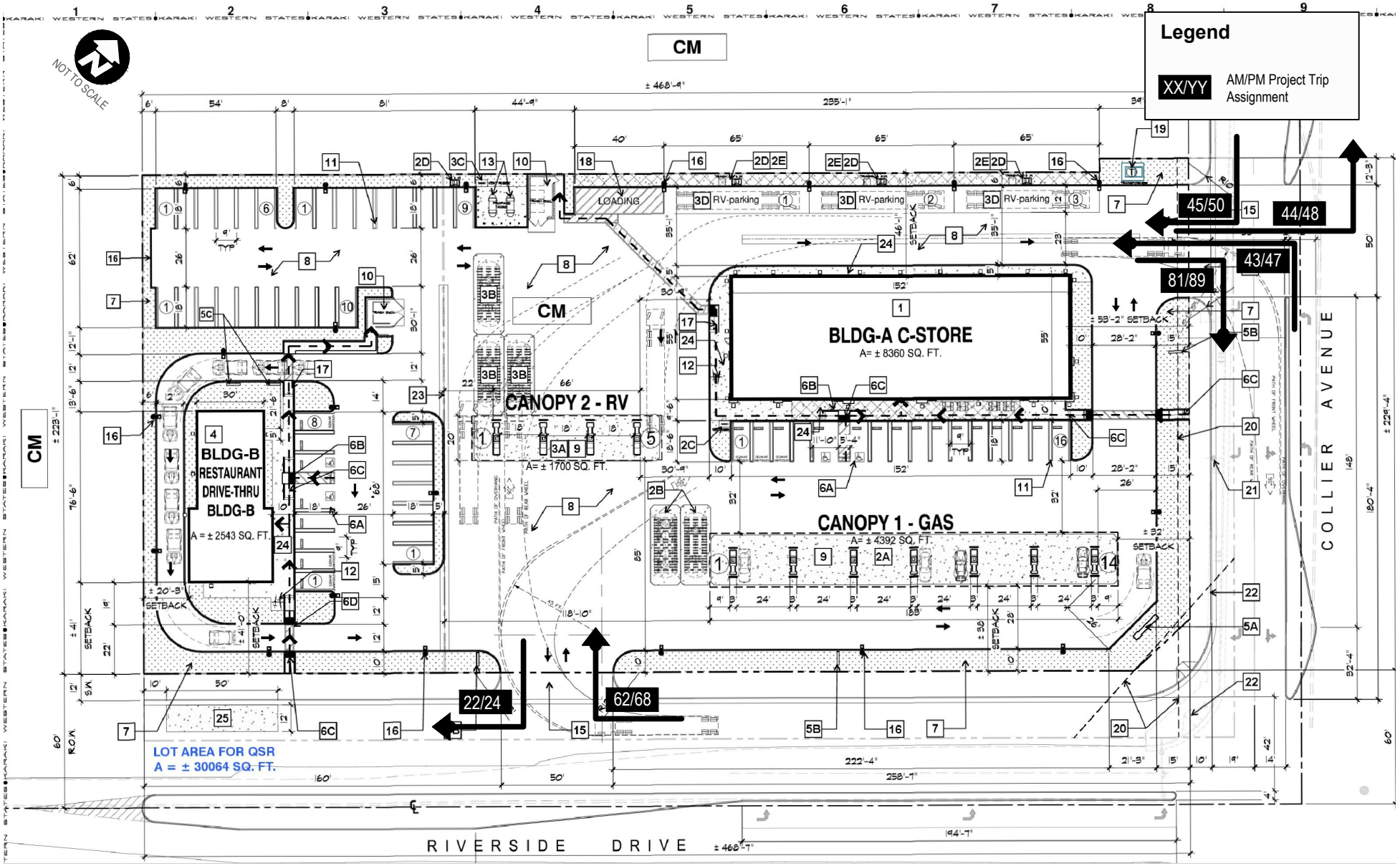


Source: Google Maps, 10/2016

Project □et Total Trip □ssignment

FIGURE
5

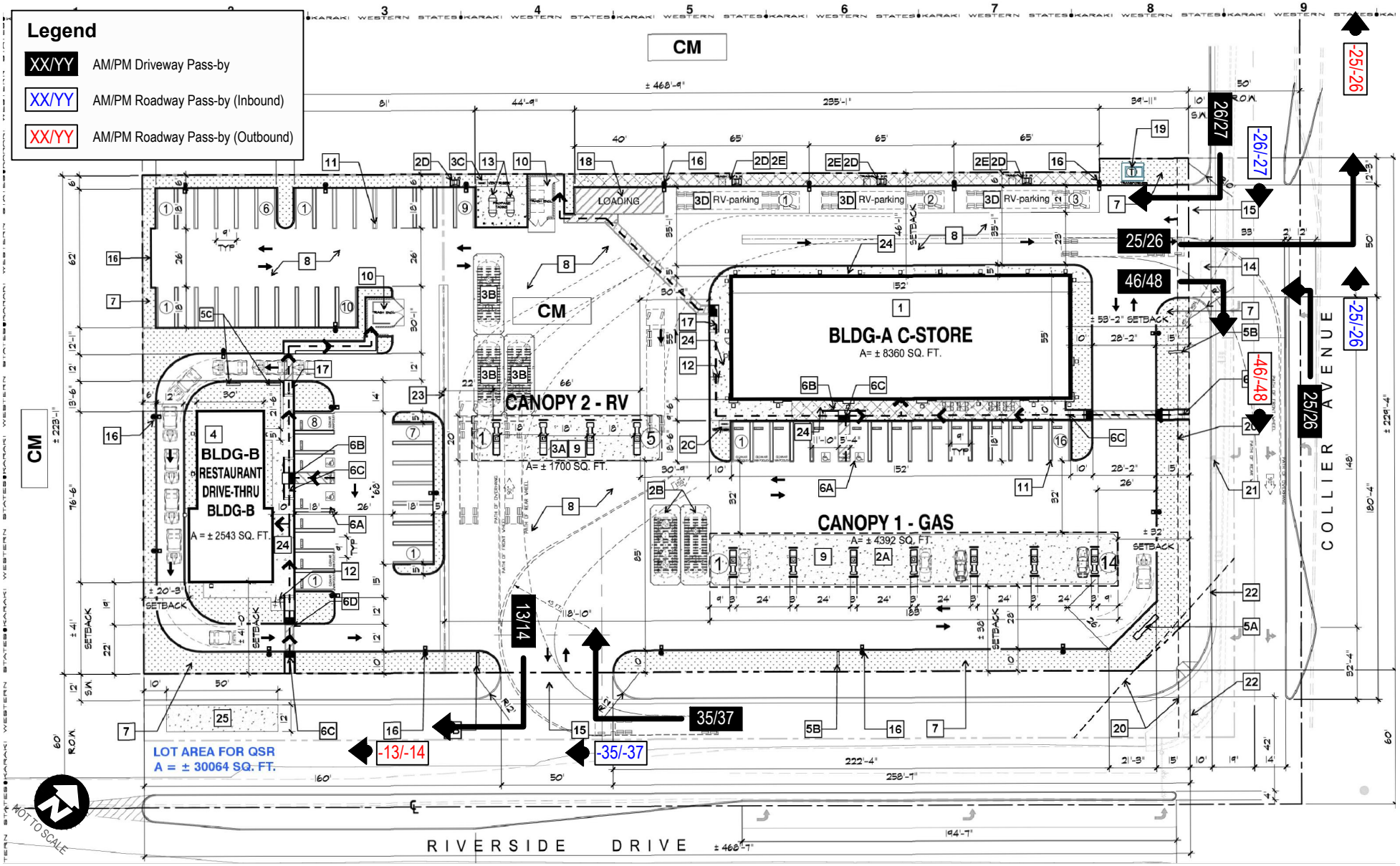
Kassab Travel Center TIA



Project Drive□a□Trip □ssignment

Kassab Travel Center TIA

FIGURE
6



Project Drive□a□Pass□□□ □ssignment

Kassab Travel Center TIA

FIGURE
7

Chapter 3. Existing Conditions

This section describes Existing conditions within the identified study area, as well as the Existing plus Project conditions and potential traffic impacts. Characteristics are provided for the roadway network, peak hour traffic volumes, traffic operations, traffic safety, non-motorized facilities, and transit.

Street System

Characteristics of the existing street system in the proposed project vicinity are shown in Table 4. Traffic control and geometrics at study area intersections is illustrated in Figure 8. As shown on Figure 2, access to the project is proposed to be provided from a driveway on Collier Avenue and two driveways on Riverside Drive (SR-74).

Table 4. Study Area Existing Street System Summary

Roadway	Street Classification1	Posted Speed Limit (mph)	Number of Travel Lanes	Parking	Sidewalks	Bicycle Lanes
Collier Avenue	Major	50	4	NO	YES	No
Nichols Road	Urban Arterial	40	2	N0	Some Segments	No
Riverside Drive (SR-74)	Urban Arterial	45	2	N0	E/O Collier Ave	No
Central Avenue (SR-74)	Augmented Urban Arterial	30 W/O Collier, 45 E/O Collier	4	NO	North Side Only, some segments on the South Side	No
Lakeshore Drive	Urban Arterial/Secondary	45	2 S/O Riverside Dr, 5 N/O Riverside Dr	NO	N/O Riverside Drive, some segments S/O Riverside Drive	No
Dexter Avenue	Collector	45	2 S/O Central, 3 N/O Central	NO	N/O Central Ave, some segments S/O Central Ave	No

Street classification is from the City of Lake Elsinore General Plan, N/O = north of, S/O = south of, E/O = east of, W/O = west of

Riverside Transit Agency (RTA) Routes 8 and 22 provide weekday and weekend service along Collier Avenue (SR-74). There is a bus stop on the east side of Collier Avenue (SR-74) north of Riverside Drive. This stop is directly across the project site.

Traffic Volumes

Existing turning movement counts at the study intersections were conducted in 2014, 2016, and 2017 while adjacent schools were in session. Traffic volumes collected in 2014 or 2016 were adjusted using an annual growth rate of two percent to bring them to existing 2017 conditions. Figure 9 illustrates the existing AM and PM peak hour traffic volumes.

Intersection Operations

An intersection LOS analysis was prepared for the Existing Baseline condition and is shown in Table 5. The adopted LOS threshold for the study locations is LOS D. Detailed LOS worksheets are included in Appendix C

Table 5. Existing Peak Hour Levels of Service

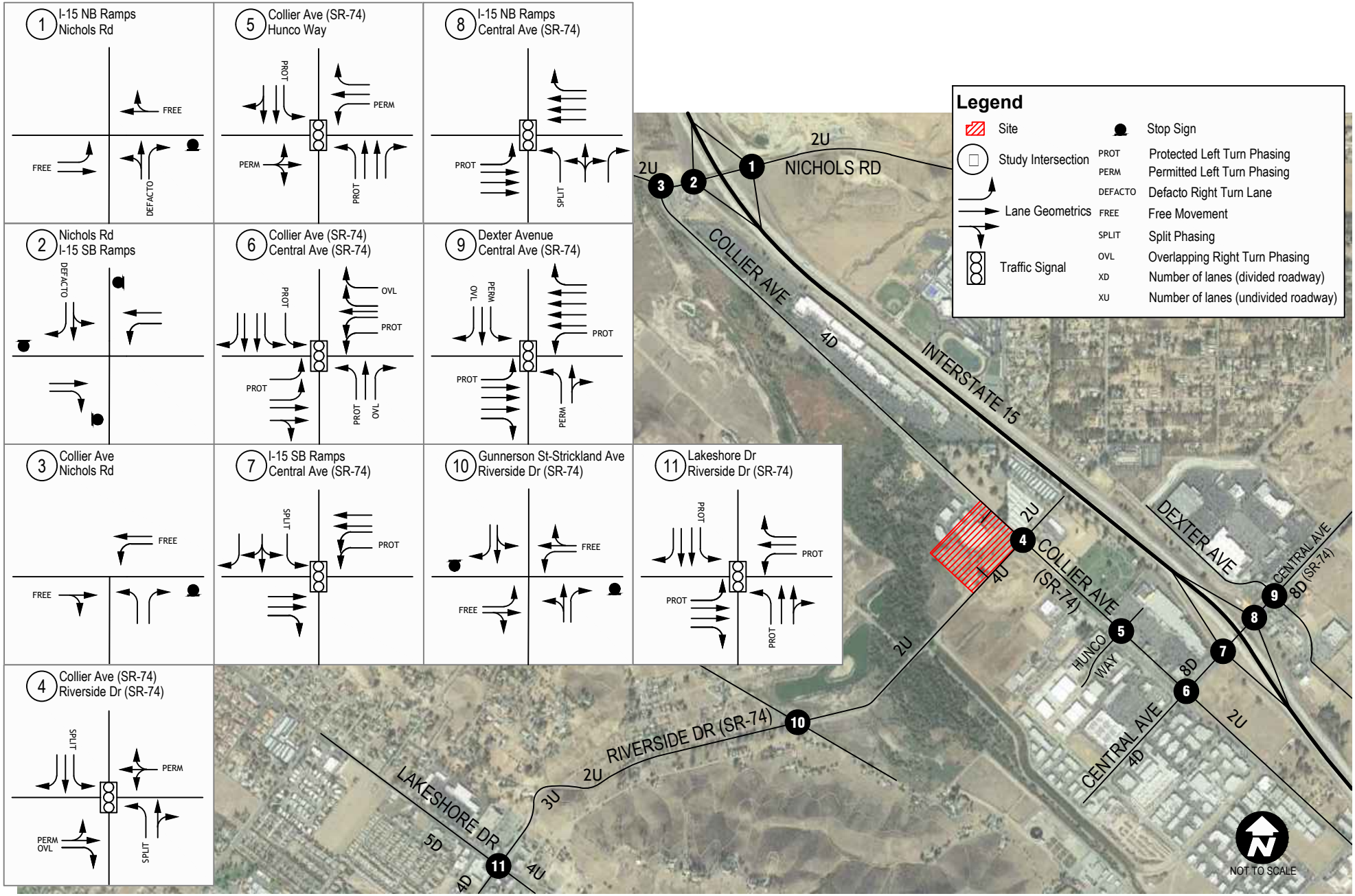
Intersection	Control	AM Peak		PM Peak	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. I-15 NB Ramps/Nichols Road	unsignalized	**103.5**	**F**	25.2	D
2. I-15 SB Ramps/Nichols Road	unsignalized	13.7	B	12.6	B
3. Collier Avenue/Nichols Road	unsignalized	20.3	C	31.5	D
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	signal	16.0	B	25.7	C
5. Collier Avenue (SR-74)/Hunco Way	signal	9.0	A	14.6	B
6. Collier Ave (SR-74)/Central Avenue (SR-74)	signal	34.0	C	37.8	D
7. I-15 SB Ramps/Central Avenue (SR-74)	signal	23.0	C	25.5	C
8. I-15 NB Ramps/Central Avenue (SR-74)	signal	13.8	B	13.5	B
9. Dexter Avenue/Central Avenue (SR-74)	signal	22.9	C	19.6	B
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	unsignalized	**62.3**	**F**	**209.1**	**F**
11. Lakeshore Drive/Riverside Drive (SR-74)	signal	26.3	C	34.8	C

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.

As shown in Table 5 all of the study intersections are currently operating at satisfactory LOS D or better during the weekday AM and PM peak hours under Existing conditions except for the following intersections:

- I-15 NB Ramps/Nichols Road (LOS F during the AM peak hour)
- Gunnerson Street-Strickland avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

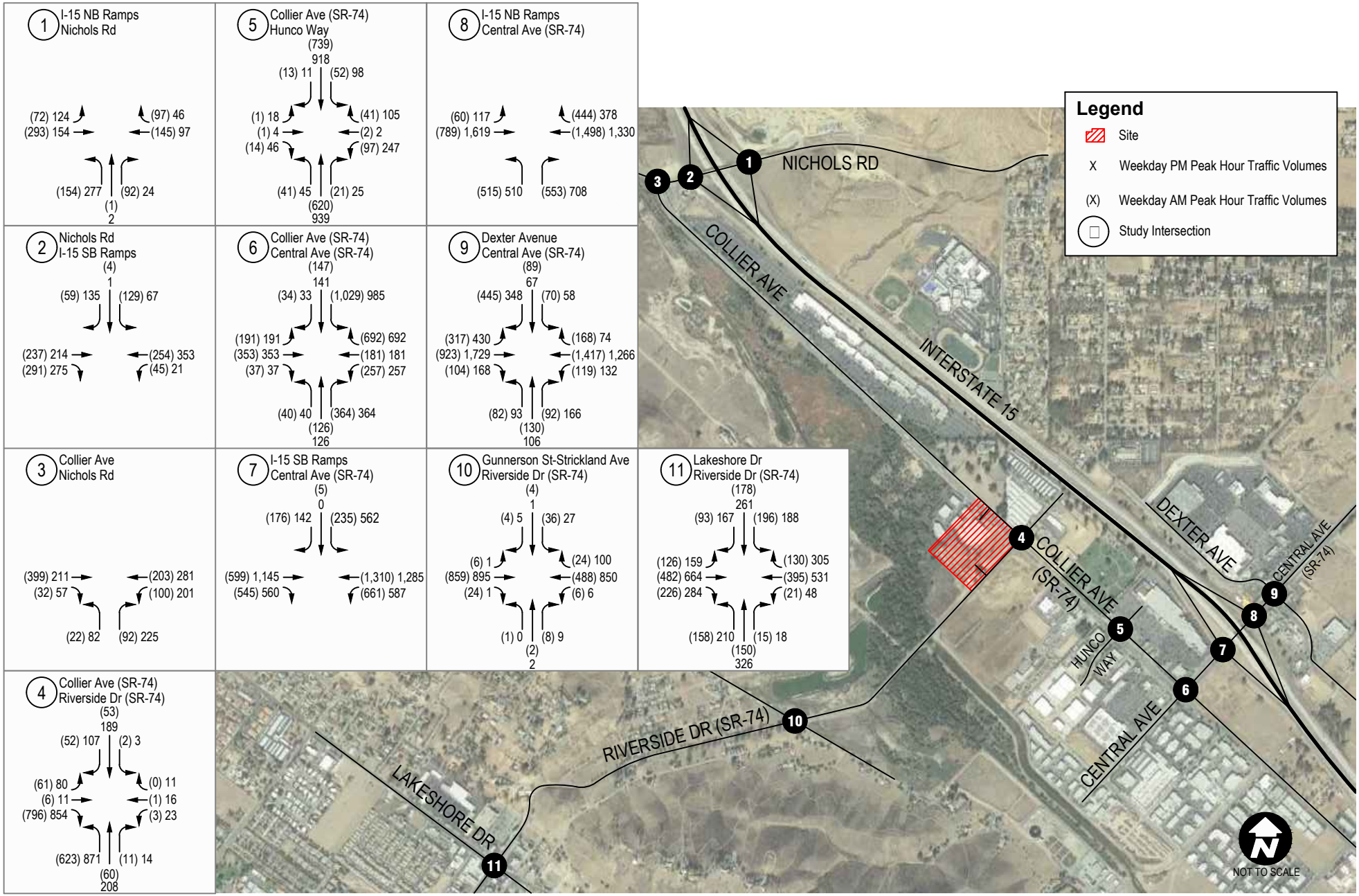


Source: Google Maps, 10/2016

Existing Traffic Controls and Geometrics

FIGURE 8

Kassab Travel Center TIA



Source: Google Maps, 10/2016

E□isting Pea□ □our Tra□ic Volumes

Kassab Travel Center TIA

FIGURE
9

Chapter 4. Existing plus Project Traffic Analysis

This section documents project-generated impacts on the surrounding transportation system and at the study intersections during the Existing plus Project condition.

Traffic Volumes

Existing plus Project traffic volumes were determined by adding the project traffic volumes to the Existing traffic volumes. Figure 10 shows the Existing plus Project weekday AM and PM peak hour traffic volumes.

Intersection Operations

An intersection operations analysis was conducted to evaluate the Existing plus Project weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously. Project-related improvements to the existing traffic controls or geometrics were assumed for Collier Avenue/Riverside. These improvements are as follows:

- Restripe existing northbound through-right to through-left-right movement
- Reconfigure southbound approach to reflect cut into existing median to create larger storage length for Collier Avenue driveway inbound access.
    - Restripe existing southbound through lane to shared through-left movement

The remainder of the traffic controls and geometrics illustrated in Figure 8 were assumed. The project is expected to widen the north side of Riverside Drive along the project frontage. Table 6 provides a comparison between the Existing plus Project and Existing conditions for the weekday AM and PM peak hours. Detailed LOS worksheets are included in Appendix C.

As shown in Table 6, most of the study area intersections are forecast to operate at LOS D or better with the project, except for the following intersections:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

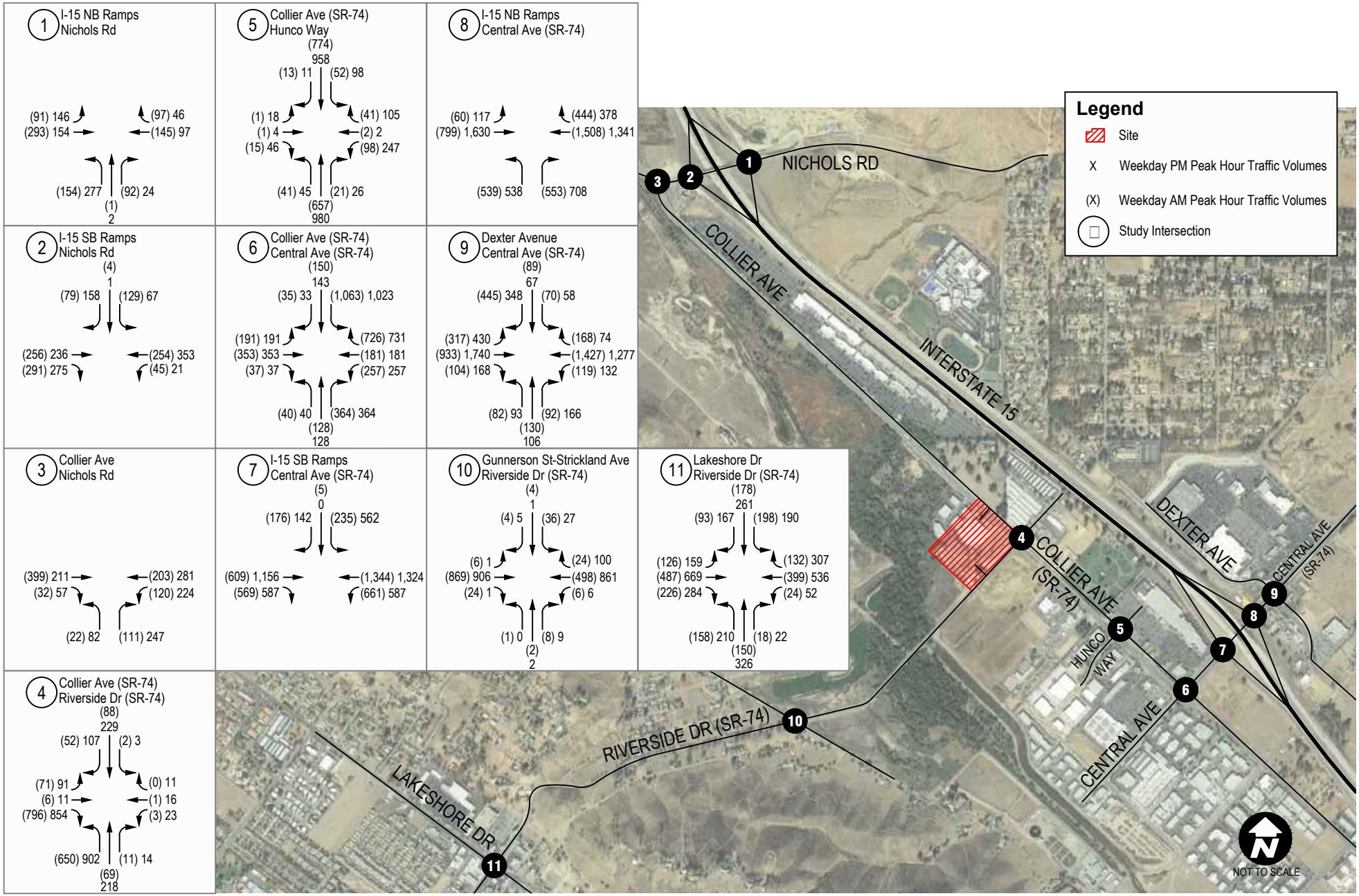
These intersections would be considered significantly impacted as the project would contribute its traffic to an intersection that is forecast to operate less that the City standard of LOS D or would cause an intersection that is operating at LOS D or better, to LOS E or F. Mitigation measures for these intersections are discussed in the mitigation section.

Table 6. Existing plus Project Intersection Levels of Service

	Existing				Existing plus Project				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**103.5**	**F**	25.2	D	**148.5**	**F**	29.8	D	**45.0**	4.6	**YES**	NO
2. I-15 SB Ramps/Nichols Road	13.7	B	12.6	B	14.2	B	13.0	B	0.5	0.4	NO	NO
3. Collier Avenue/Nichols Road	20.3	C	31.5	D	21.8	C	**35.9**	**E**	1.5	**4.4**	NO	**YES**
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	16.0	B	25.7	C	12.2	B	21.1	C	-3.8	-4.6	NO	NO
5. Collier Avenue (SR-74)/Hunco Way	9.0	A	14.6	B	9.1	A	14.8	B	0.1	0.2	NO	NO
6. Collier Ave (SR-74)/Central Avenue (SR-74)	34.0	C	37.8	D	34.3	C	41.2	D	0.3	3.4	NO	NO
7. I-15 SB Ramps/Central Avenue (SR-74)	23.0	C	25.5	C	24.7	C	26.8	C	1.7	1.3	NO	NO
8. I-15 NB Ramps/Central Avenue (SR-74)	13.8	B	13.5	B	13.8	B	13.6	B	0.0	0.1	NO	NO
9. Dexter Avenue/Central Avenue (SR-74)	22.9	C	19.6	B	22.9	C	19.6	B	0.0	0.0	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**62.3**	**F**	**209.1**	**F**	**65.9**	**F**	**217.8**	**F**	**3.6**	**8.7**	**YES**	**YES**
11. Lakeshore Drive/Riverside Drive (SR-74)	26.3	C	34.8	C	26.6	C	35.1	D	0.3	0.3	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.



Source: Google Maps, 10/2016

E□isting plus Project Pea□ □our Tra□i□c Volumes

FIGURE
10

Kassab Travel Center TIA

Chapter 5. Existing plus Ambient Growth plus Project Traffic Analysis

This section documents project-generated impacts on the surrounding transportation system and at the study intersections during the Existing plus Ambient Growth plus Project condition.

Central Plaza Project

The Central Plaza project is currently under construction on the southeast corner of Collier Avenue (SR-74)/Central Avenue (SR-74). The project will widen the roadways along its frontage as well as provide the following alterations in geometry to the intersection:

- Northbound approach will consist of one left turn lane, two through lanes, and two right turn lanes with overlap phasing

These alterations have been included within the analysis for Existing plus Ambient Growth plus Project scenario in addition to the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario. Due to these improvements over existing geometrics, some analyzed peak hours will contain a decrease in delay as compared to baseline condition.

Traffic Volumes

Existing plus Ambient Growth plus Project traffic volumes were determined by adding a growth rate of two (2) percent per year to the existing traffic volumes as directed by the City Traffic Engineer. Then, the project traffic volumes were added to the Existing plus Ambient Growth traffic volumes. Figure 11 shows the Existing plus Ambient Growth plus Project weekday AM and PM peak hour traffic volumes.

Intersection Operations

An intersection operations analysis was conducted to evaluate the Existing plus Ambient Growth plus Project weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously. Project-related improvements to the existing traffic controls or geometrics were assumed for Collier Avenue/Riverside as well as the improvements listed about for the Central Plaza Project. These improvements are as follows:

- Restripe existing northbound through-right to through-left-right movement
- Reconfigure southbound approach to reflect cut into existing median to create larger storage length for Collier Avenue driveway inbound access.
    - Restripe existing southbound through lane to shared through-left movement

The remainder of the traffic controls and geometrics illustrated in Figure 8 were assumed. The project is expected to widen the north side of Riverside Drive along the project frontage in the future, but the specific geometrics are unknown at this time. Table 7 provides a comparison between the Existing plus Ambient Growth plus Project and Existing conditions for the weekday AM and PM peak hours. Detailed LOS worksheets are included in Appendix C.

As shown in Table 6, most of the study area intersections are forecast to operate at LOS D or better with the project, except for the following intersections:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

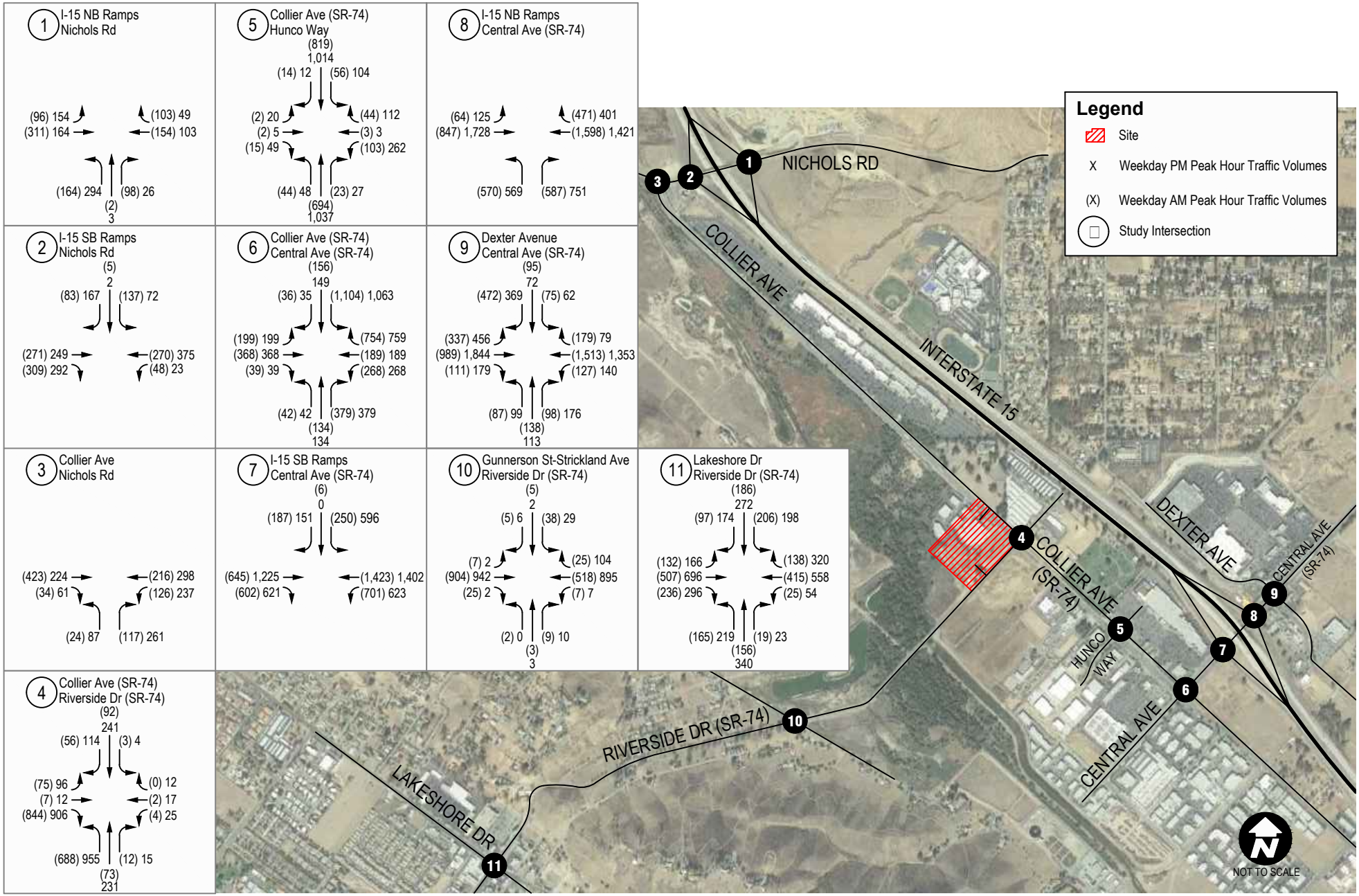
These intersections would be considered significantly impacted as the project would contribute its traffic to an intersection that is forecast to operate less that the City standard of LOS D or would cause an intersection that is operating at LOS D or better, to LOS E or F. Mitigation measures for these intersections are discussed in the mitigation section.

Table 7. Existing plus Ambient Growth plus Project Intersection Levels of Service

	Existing				Existing plus Ambient Growth plus Project				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**103.5**	**F**	25.2	D	**228.7**	**F**	**37.7**	**E**	**125.2**	12.5	**YES**	**YES**
2. I-15 SB Ramps/Nichols Road	13.7	B	12.6	B	15.4	C	14.1	B	1.7	1.5	NO	NO
3. Collier Avenue/Nichols Road	20.3	C	31.5	D	23.8	C	**44.0**	**E**	3.5	**12.5**	NO	**YES**
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	16.0	B	25.7	C	13.0	B	23.3	C	-3.0	-2.4	NO	NO
5. Collier Avenue (SR-74)/Hunco Way	9.0	A	14.6	B	9.4	A	16.0	B	0.4	1.4	NO	NO
6. Collier Ave (SR-74)/Central Avenue (SR-74)	34.0	C	37.8	D	32.9	C	40.3	D	-1.1	2.5	NO	NO
7. I-15 SB Ramps/Central Avenue (SR-74)	23.0	C	25.5	C	28.0	C	31.0	C	5.0	5.5	NO	NO
8. I-15 NB Ramps/Central Avenue (SR-74)	13.8	B	13.5	B	14.1	B	13.9	B	0.3	0.4	NO	NO
9. Dexter Avenue/Central Avenue (SR-74)	22.9	C	19.6	B	23.6	C	20.1	C	0.7	0.5	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**62.3**	**F**	**209.1**	**F**	**83.0**	**F**	**314.2**	**F**	**20.7**	**105.1**	**YES**	**YES**
11. Lakeshore Drive/Riverside Drive (SR-74)	26.3	C	34.8	C	27.9	C	37.8	D	1.6	3.0	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.



Source: Google Maps, 10/2016

E□isting plus □m□ient Gro□t□ plus Project Pea□ □our Tra□ic Volumes

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FIGURE
11

Chapter 6. Existing plus Ambient Growth plus Project plus Cumulative Projects Traffic Analysis

This section documents project-generated impacts in the cumulative condition on the surrounding transportation system and at the study intersections during the Existing plus Ambient Growth plus Project plus Cumulative Projects condition.

Traffic Volumes

Existing plus Ambient Growth plus Project plus Cumulative Projects traffic volumes were determined by adding a growth rate of two (2) percent per year to the existing traffic volumes as directed by the City Traffic Engineer. In addition, any traffic from cumulative (approved/ pending) projects were added to the study area intersections. City staff provided a list of cumulative projects. A majority of the projects were collated from the nearby Central Plaza project as well as other traffic impact studies. Appendix D provides information concerning the distribution and assignment of these projects, as well as the exact locations of each.

These projects are illustrated within Appendix D, while Figure 12 shows the cumulative projects' traffic volumes.

Trip generation estimates for these projects are based on application of trip rates from the Institute of Transportation Engineers' *Trip Generation, 9th Edition* (ITE 2012), and are presented in Table 8. As shown in Table 8, the cumulative projects in the study area would generate approximately 472,917 daily trips, 30,065 AM peak hour trips and 45,496 PM peak hour trips. The resulting Existing plus Ambient Growth plus Project plus Cumulative Projects Peak Hour Traffic Volumes are illustrated in Figure 13.

Intersection Operations

An intersection operations analysis was conducted in the study area to evaluate the Existing plus Ambient Growth plus Project plus Cumulative Projects weekday AM and PM peak hour conditions with the project. Intersection operations were calculated using the LOS methodology described previously.

The approved Central Plaza project will be improving its frontages along Collier Avenue and Central Avenue (SR-74) with the following roadway improvements:

- Collier Avenue/Central Avenue (SR-74)
  - addition of second northbound through lane
  - addition of second northbound right turn lane

- I-15 southbound ramps/Central Avenue (SR-74)
  - addition of third eastbound through lane

Table 8. Cumulative Projects Trip Generation Estimates

				AM Peak Hour			PM Peak Hour		
Land Use		**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates [1]									
Fitness Center		TSF	32.93	0.71	0.71	1.41	2.01	1.52	3.53
Single Family Residential		DU	9.52	0.19	0.56	0.75	0.63	0.37	1.00
Mini-Warehousing		ACRES	35.43	1.16	1.42	2.58	1.79	1.79	3.57
Senior Adult Housing - Attached		DU	3.44	0.07	0.13	0.20	0.14	0.12	0.25
Automobile Sales		TSF	32.30	1.44	0.48	1.92	1.05	1.57	2.62
Manufacturing		TSF	3.82	0.57	0.16	0.73	0.26	0.47	0.73
Residential Condominium/Townhouse		DU	5.81	0.07	0.37	0.44	0.35	0.17	0.52
Shopping Center		TSF	42.70	0.60	0.36	0.96	1.78	1.93	3.71
Project Trip Generation									
CUP03503 - Fitness Facility	45.46	TSF	1,497	32	32	64	91	69	160
PM33840 - Subdivide 4 res lots	4	DU	38	1	2	3	3	1	4
PM34997 - Subdivide 2 res lots	2	DU	19	0	1	1	1	1	2
PP20247 - Self-Storage (Mini-Warehouse & RV Parking Facility)	14.72	ACRES	522	17	21	38	26	26	53
(APN: 378-030-006) Boat Sale and Manufacturing Facility[2]	34.50	TSF	136	21	6	27	10	17	27
Spyglass Ranch (Single Family, Multi-family, and Commerical)[3]	694	DU	12,165	197	409	606	647	503	1,150
South Shore I (Single Family Res.)[3]	521	DU	4,960	98	293	391	328	193	521
South Shore II (Single Family Res.)[3]	400	DU	3,808	75	225	300	252	148	400
La Strada (Single Family Res.)[3]	134	DU	1,276	25	75	100	84	50	134
TAG Property (Car Dealership)[3]	50	TSF	1,615	72	24	96	52	79	131
City Center Condos[3]	144	DU	837	11	53	64	50	25	75
Diamond Specific Plan (Condos, Hotel, Office, Commerical)[3]			29,554	956	504	1,460	1,204	1,584	2,788
The Colony (Multi-family)[3]	211	DU	1,403	22	86	108	85	46	131
TAG Property (Single Family and Multi-family)[3]	2731	DU	24,797	475	1,472	1,947	1,629	947	2,576
John Lang Homes Phase 2 (Single Family, Multi-family, and Commerical)[3]	1955	DU	18,490	281	871	1,152	1,049	676	1,725
Summerly (Single Family Res.)[3]	142	DU	1,352	27	80	107	89	53	142
Beazer (Single Family Res.)[3]	72	DU	685	14	41	55	45	27	72
KB Homes (Single Family Res.)[3]	106	DU	1,009	20	60	80	67	39	106
McMillin Homes (Single Family Res.)[3]	143	DU	1,361	27	80	107	90	53	143
Richmond American (Single Family Res.)[3]	74	DU	704	14	42	56	47	27	74

LE Sports Complex[3]	525	TSF	17,756	710	366	1,076	705	734	1,439
Greenwald (Commercial)[3]	104.45	TSF	4,460	62	38	100	186	202	388
Ramsgate (Single Family and Multi-family)[3]	1426	DU	13,130	254	779	1,033	865	504	1,369
Canyon Hills Estates (Single Family Res.)[3]	302	DU	2,875	57	170	227	190	112	302
Canyon Hills (Single Family and Multi-family)[3]	5278	DU	45,727	855	2,726	3,581	2,968	1,712	4,680
Marina Village Condos[3]	94	DU	546	7	34	41	33	16	49
Lakeshore Town Center (Mixed-Use Commerical)[3]	237.40	TSF	10,137	141	87	228	423	458	881
Lake Elsinore Walmart (Commerical)[3]	168.80	TSF	11,723	339	256	595	412	417	829
Alberhill Ridge (Single Family, Multi-family, Office, and Commerical)[3]			48,829	1,569	1,110	2,679	2,185	2,616	4,801
Alberhill Ranch (Single Family Res.)[3]	1986	DU	18,907	372	1,117	1,489	1,251	735	1,986
Terracina (Single Family Res.)[3]	365	DU	3,475	68	205	273	230	135	365
Alberhill Villages (All Proposed Land Uses)[3]			158,189	4,875	5,258	10,133	7,850	7,665	15,515
Wakerider (Resort)[3]	11.35	TSF	2,201	73	60	133	88	71	159
Village at Lakeshore (Multi-family)[3]	163	DU	947	12	60	72	57	28	85
Circle K (Gas Station/Car Wash)[3]	4.50	TSF	1,834	72	70	142	85	81	166
Golden Corral (Restaurant)[3]	7.80	TSF	992	46	38	84	46	31	77
La Quinta Inn (Hotel)[3]	64	RM	523	20	14	34	20	19	39
Ness Industrial Garage (Industrial)[3]	12	TSF	84	10	1	11	1	10	11
Fairway Business Park (Industrial)[3]			1,952	227	31	258	33	239	272
Trieste (Single Family Res.)[3]	75	DU	714	14	42	56	47	28	75
Central Plaza (Commerical)[3]	75	TSF	7,269	181	138	319	150	147	297
Artisan Alley (Commerical)[4]	95.1	TSF	5,543	135	105	240	283	174	457
Quickrete Plant	163.9	TSF	626	93	26	120	43	77	120
Lakeshore Senior Apartments	121	DU	416	8	16	24	16	14	30
Running Deer (Single Family Res.)	101	DU	962	19	57	76	64	37	101
Lakeview Manor (Multi-family)[5]	104	DU	685	10	38	48	39	21	60
Honda Dealership	53.4	TSF	1725	77	26	103	56	84	140
North Peak Plaza (Mixed-Use)	92	DU	535	7	34	40	32	16	48
	92	TSF	3928	55	34	88	164	177	341
Total Trip Generation			472,917	12,753	17,312	30,065	24,371	21,125	45,496

SEE APPENDIX D FOR COMPLETE CUMULATIVE PROJECT INFORMATION; Notes: TSF = Thousand Square Feet, DU = Dwelling Units, RM = Rooms

[1] All Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012.

[2] Trip generation estimates from: Scoping Agreement for Proposed Boat and Sale Manufacturing Facility on Riverside Drive, June 30, 2017.

[3] Trip generation estimates from: Central Plaza Traffic Impact Study by RK Engineering Group Inc., February 9, 2017.

[4] Trip generation estimates from: Mission Trail Apartments Project Traffic Impcat Analysis Report by LLG Inc., March 22, 2017.

[5] Trip generation estimates from: Lakeview Manor Traffic Impcat Analysis by LOS Engineering Inc., January 9, 2017.

The proposed project is expected to widen the north side of Riverside Drive along the project frontage in the future, but the specific geometrics are unknown at this time.

Table 9 provides the Existing plus Ambient Growth plus Project plus Cumulative Projects conditions for the weekday AM and PM peak hours. Detailed LOS worksheets are included in Appendix C.

As shown in Table 9, all of the study area intersection are forecast to operate at LOS D or better with the project, except for the following intersections:

- I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
- Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)
- Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
- I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
- Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

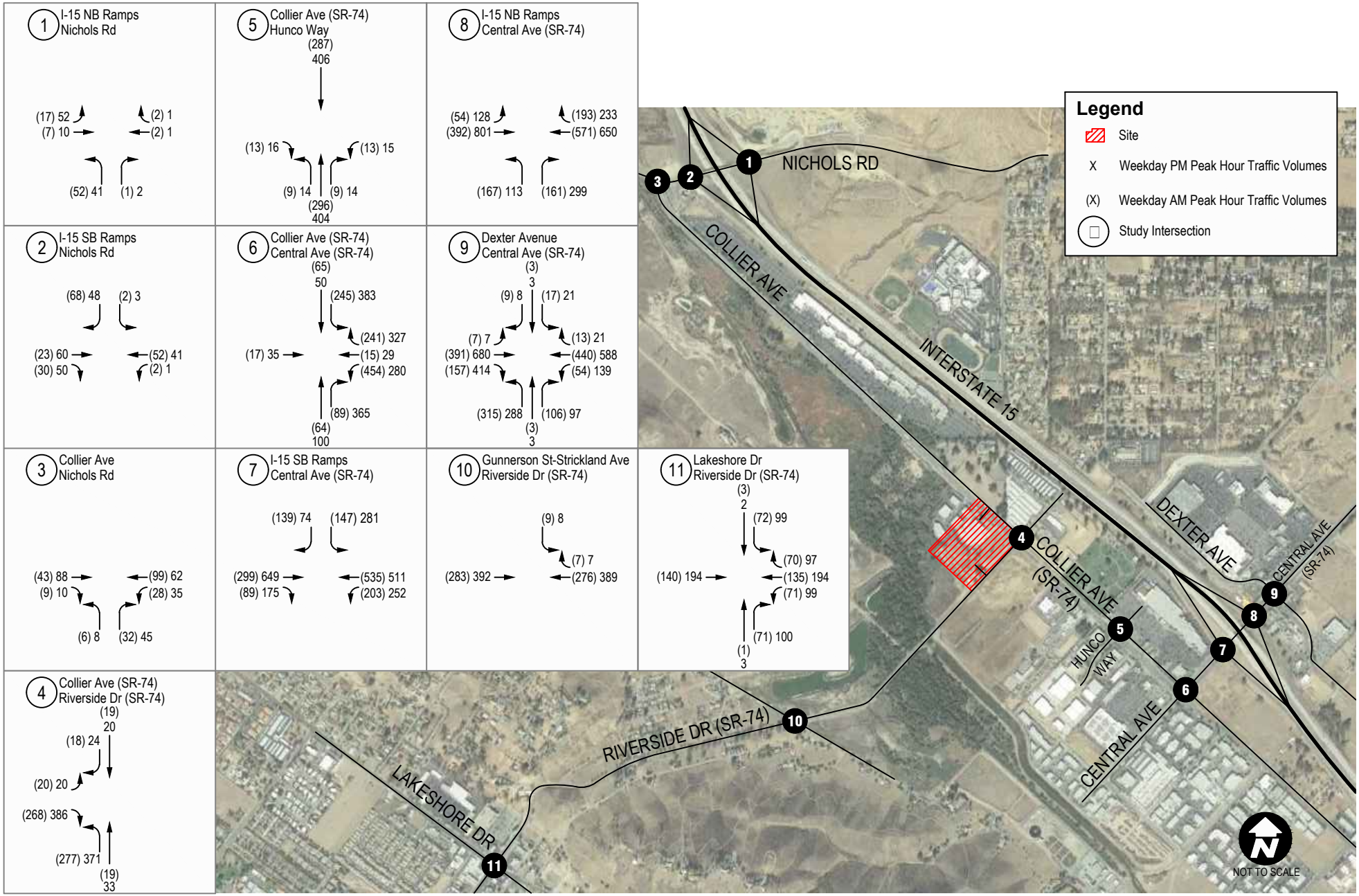
These intersections would be considered impacted as they would already contribute to an LOS that is less that the City standard of LOS D. Mitigation measures for these intersections are discussed in the mitigation section.

Table 9. Existing plus Ambient Growth plus Project plus Cumulative Projects Intersection Levels of Service

	AM Peak		PM Peak	
Intersection	**Delay[1]**	**LOS[2]**	**Delay[1]**	**LOS[2]**
1. I-15 NB Ramps/Nichols Road	**508.9**	**F**	**103.8**	**F**
2. I-15 SB Ramps/Nichols Road	20.2	C	18.1	C
3. Collier Avenue/Nichols Road	**36.3**	**E**	**115.6**	**F**
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	18.3	B	51.8	D
5. Collier Avenue (SR-74)/Hunco Way	10.9	B	22.3	C
6. Collier Ave (SR-74)/Central Avenue (SR-74)	**70.2**	**E**	**60.4**	**E**
7. I-15 SB Ramps/Central Avenue (SR-74)	43.0	D	**96.3**	**F**
8. I-15 NB Ramps/Central Avenue (SR-74)	20.6	C	42.3	D
9. Dexter Avenue/Central Avenue (SR-74)	**57.1**	**E**	53.0	D
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**612.3**	**F**	**3328.7**	**F**
11. Lakeshore Drive/Riverside Drive (SR-74)	36.2	D	53.4	D

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.



Source: Google Maps, 10/2016

Cumulative Project Traffic Volumes

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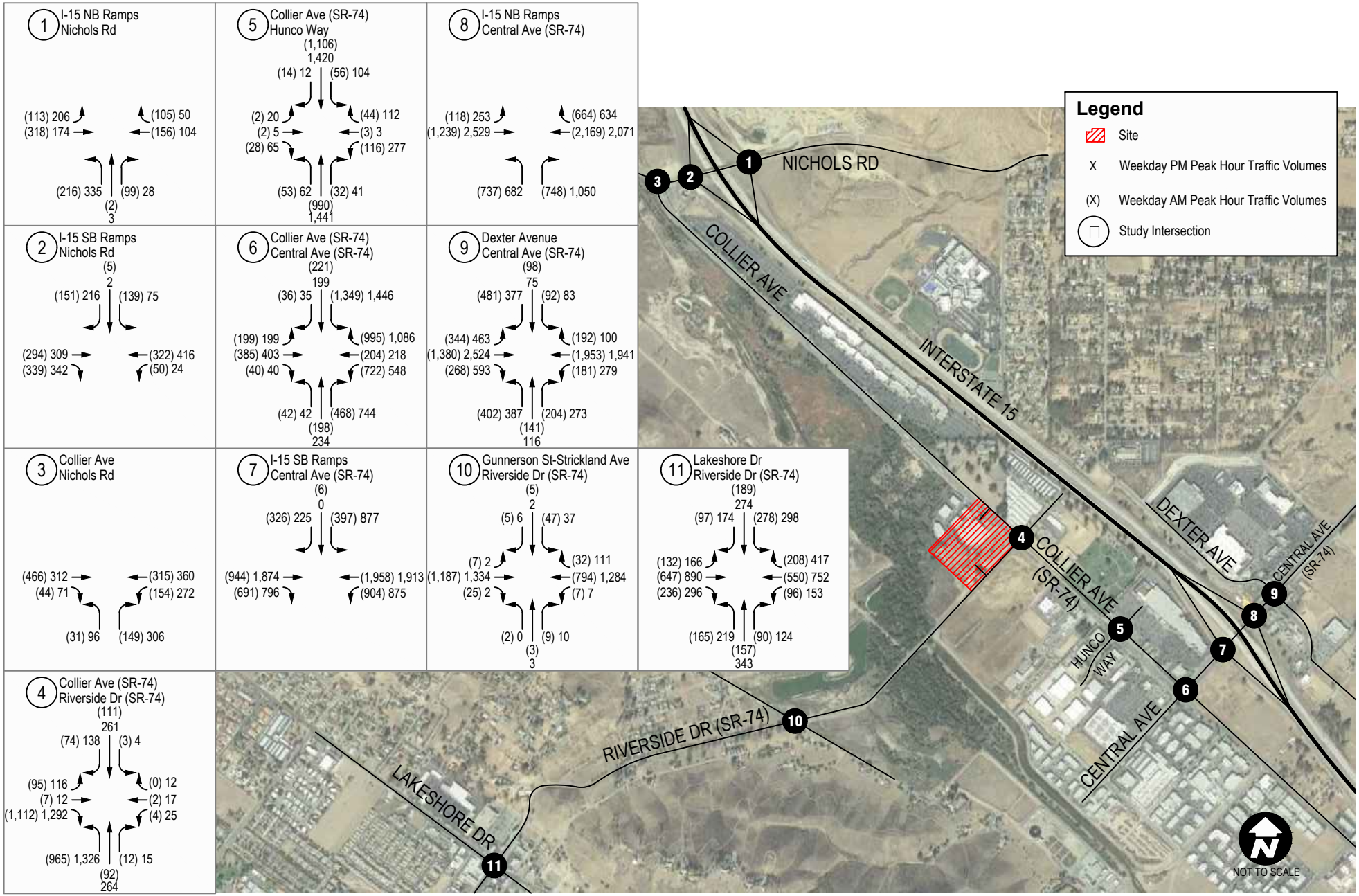
FIGURE
12



Source: Google Maps, 10/2016

E□isting plus □m□ient Gro□t□ plus Cumulative Projects plus Project Pea□ □our Tra□ic Volumes

FIGURE 13

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Chapter 7. Roadway Segment Analysis

The project is forecast to generate a net of approximately 1,919 average daily trips. A average daily traffic (ADT) roadway segment analysis for the following segments was conducted, based on input from City Staff:

- Riverside Drive (SR-74), west of Collier Avenue
- Collier Avenue, north of Riverside Drive (SR-74)
- Collier Avenue, south of Riverside Drive (SR-74)

Traffic volumes for Collier Avenue, north of Riverside Drive (SR-74) were collected in May 2017. Traffic volumes for Collier Avenue between Riverside Drive (SR-74) and Central Avenue were collected in June 2017. Traffic volumes for Riverside Drive (SR-74), west of Collier Drive were collected in August 2017. This count data is provided in Appendix B.

The ADT analysis for the Existing and Existing plus Project conditions are shown in Table 10, while the ADT analysis for the Existing and Existing plus Ambient Growth plus Project conditions are shown in Table 11. The ADT analysis for the Existing plus Ambient Growth plus Project plus Cumulative Projects condition is shown in Table 12. Per the City's General Plan, LOS D is the minimum acceptable standard used for this analysis. Additionally, Riverside Drive (SR-74), west of Collier Avenue was adjusted to account for two lanes.

Table 10. Existing and Existing plus Project ADT Analysis

Roadway Segments	Roadway Classification	LOS Standard E[1]	Existing		Existing plus Project	
			ADT	LOS	ADT	LOS
Riverside Drive (SR-74), west of Collier Avenue	Urban Arterial[2]	17,950	26,360	E-F	26,900	E-F [3]
Collier Avenue, north of Riverside Drive (SR-74)	Major	34,100	6,540	C	7,344	C
Collier Avenue, south of Riverside Drive (SR-74)	Urban Arterial	35,900	27,790	A-C	28,846	D

[1] Standard obtained via Figure C-3, County of Riverside General Plan Circulation Element, March 2014. Using LOS E per City Standards. LOS E value is transition point between LOS D and LOS E.

[2] Adjusted for 2 lanes, not 4 as shown in Figure C-3 of County Circulation Element.

[3] Project would add second WB lane along its frontage, for a total of three through lanes (2 WB and 1 EB).

As shown in Tables 10, 11, and 12, all segments operate at LOS D or better and would operate within the City's standard of LOS D, except for Riverside Drive (SR-74), west of Collier Avenue. This segment is currently operating at LOS E-F under existing conditions, and is forecast to continue to operate at LOS E-F under Existing plus Ambient Growth plus Project Conditions, as well as with the addition of traffic from cumulative projects (Existing plus Ambient Growth plus Project plus Cumulative Projects). Collier Avenue, south of Riverside Drive (SR-74) in the Existing plus Ambient Growth plus Project plus Cumulative Projects condition is forecast to degrade to LOS F with the addition of Cumulative Project traffic.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction).

The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

Table 11. Existing and Existing plus Ambient Growth plus Project ADT Analysis

Roadway Segments	Roadway Classification	LOS Standard E[1]	Existing		Existing plus Ambient plus Project	
			ADT	LOS	ADT	LOS
Riverside Drive (SR-74), west of Collier Avenue	Urban Arterial[2]	17,950	26,360	E-F	27,980	E-F [3]
Collier Avenue, north of Riverside Drive (SR-74)	Major	34,100	6,540	C	7,640	C
Collier Avenue, south of Riverside Drive (SR-74)	Urban Arterial	35,900	27,790	A-C	30,000	D

[1] Standard obtained via Figure C-3, County of Riverside General Plan Circulation Element, March 2014. Using LOS E per City Standards. LOS E value is transition point between LOS D and LOS E.

[2] Adjusted for 2 lanes, not 4 as shown in Figure C-3 of County Circulation Element.

[3] Project would add second WB lane along its frontage, for a total of three through lanes (2 WB and 1 EB).

Table 12. Existing plus Ambient Growth plus Project plus Cumulative Projects ADT Analysis

Roadway Segments	Roadway Classification	LOS Standard E [1]	Existing plus Ambient plus Cumulative plus Project	
			ADT	LOS
Riverside Drive (SR-74), west of Collier Avenue	Urban Arterial [2]	17,950	36,809	E-F [3]
Collier Avenue, north of Riverside Drive (SR-74)	Major	34,100	8,683	A-C
Collier Avenue, south of Riverside Drive (SR-74)	Urban Arterial	35,900	38,844	F

[1] Standard obtained via Figure C-3, County of Riverside General Plan Circulation Element, March 2014. Using LOS E per City Standards. LOS E value is transition point between LOS D and LOS E.

[2] Adjusted for 2 lanes, not 4 as shown in Figure C-3 of County Circulation Element.

[3] Project would add second WB lane along its frontage, for a total of three through lanes (2 WB and 1 EB).

The roadway segment of Riverside Drive west of Collier Avenue is part of the TUMF network and will be improved to its ultimate width using those funds. However, with the improvements listed above, and the addition of project traffic (approximately 540 ADT), this segment of Riverside Drive (SR-74) is forecast to continue to operate at LOS E-F under both conditions.

Chapter 8. Special Issues: Queuing, Collier Avenue/Riverside Drive Geometry, Truck Turn Radii, Class II Bike Lane, and Pedestrian Safety Analyses

This section documents the following special issues requested to be addressed by City staff and Caltrans:

- Intersection queuing
- Collier Avenue (SR-74)/Riverside Drive (SR-74) conceptual geometry
- On-site truck turn radii
- Class II bicycle lane on Riverside Drive (SR-74)
- Pedestrian safety analysis

Queuing Analysis

A queuing analysis was conducted to determine the vehicle queues for turning movements at the study area intersections. In addition, the queuing analysis illustrates how much the queuing might increase with the addition of traffic from the proposed project. The queuing analysis is based on the Synchro LOS analysis which reports the 95th percentile (design) queues, consistent with HCM 2010.

Existing plus Project

Table 13 presents the queuing analysis for the Existing and Existing plus Project scenario. This table also illustrates the existing turning pocket length, if available, and the change in the queue length with the addition of the project. It should be noted that all of the queue lengths shown below are also exceeded in the Existing (without project) condition. As shown in Table 13, the following intersections/movements are expected to exceed the existing turn pocket (queue storage) length in the Existing plus Project condition:

- I-15 NB Ramps/Nichols Road
  - NBR pocket length = 50', queue length = 76'
- I-15 SB Ramps/Nichols Road
  - SBR pocket length = 50', queue length = 67'
- Collier Avenue (SR-74)/Hunco Way
  - SBL pocket length = 220', queue length = 265'
- Collier Avenue (SR-74)/Central Avenue (SR-74)
  - EBL pocket length = 150', queue length = 179'
  - NBL pocket length = 100', queue length = 127'
  - NBR pocket length = 50', queue length = 85'
- I-15 SB Ramps/Central Avenue (SR-74)
  - SBL pocket length = 100', queue length = 149'
  - SBR pocket length = 100', queue length = 165'

Table 13. Existing and Existing plus Ambient Growth plus Project Queuing Analysis

			Existing		Existing Plus Project		Change		Exceeds Turn Pocket Length?	
Intersection	Movement	Existing Pocket Length (feet)	AM	PM	AM	PM	AM	PM	AM	PM
1. I-15 NB Ramps/Nichols Rd										
	EBL	275	41	40	46	44	5	4	No	No
	NBR	50	71	56	76	54	5	-2	Yes	Yes
2. I-15 SB Ramps/Nichols Rd										
	EBR	150	88	62	82	57	-6	-5	No	No
	WBL	280	47	41	48	40	1	-1	No	No
	SBR	50	49	65	58	67	9	2	Yes	Yes
3. Collier Ave (SR-74)/Nichols Rd										
	WBL	135	51	56	55	61	4	5	No	No
4. Collier Ave (SR-74)/Riverside Dr (SR-74)										
	EBL[1]	0	69	96	80	107	11	11	No	No
	EBR[1]	0	157	467	203	578	46	111	No	No
	SBL[2]	6000	11	12	78	292	67	280	No	No
5. Collier Ave (SR-74)/Hunco Way										
	WBL[1]	0	90	174	83	188	-7	14	No	No
	WBR[1]	0	36	63	39	83	3	20	No	No
	NBL	250	52	159	50	180	-2	21	No	No
	SBL	220	67	158	52	265	-15	107	No	Yes
6. Collier Ave (SR-74)/Central Avenue (SR-74)										
	EBL	150	91	100	179	167	88	67	Yes	Yes
	WBL[1]	0	125	100	141	106	16	6	No	No
	NBL	100	116	97	127	118	11	21	Yes	Yes
	NBR	50	82	84	82	85	0	1	Yes	Yes
	SBL	900	331	734	536	804	205	70	No	No
7. I-15 SB Ramps/Central Ave (SR-74)										
	EBR[1]	0	251	250	259	275	8	25	No	No
	WBL	400	218	153	226	178	8	25	No	No
	SBL	100	123	161	126	149	3	-12	Yes	Yes
	SBR	100	127	164	140	165	13	1	Yes	Yes
8. I-15 NB Ramps/Central Ave (SR-74)										
	EBL	250	85	121	92	126	7	5	No	No
	NBL	100	173	172	171	175	-2	3	Yes	Yes
	NBR	100	110	159	109	162	-1	3	Yes	Yes
9. Dexter Ave/Central Ave (SR-74)										
	EBL[1]	0	260	147	247	178	-13	31	No	No
	EBR[1]	0	47	47	53	57	6	10	No	No
	WBL	200	161	182	135	157	-26	-25	No	No
	WBR	300	130	227	127	205	-3	-22	No	No
	NBL	120	123	139	133	142	10	3	Yes	Yes
	SBL	175	133	80	110	75	-23	-5	No	No
	SBR	150	187	126	188	131	1	5	Yes	No
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)										
	EBL	50	16	12	15	0	-1	-12	No	No
	WBL	50	17	16	22	18	5	2	No	No
	NBR	50	5	7	0	5	-5	-2	No	No
	SBR	50	16	23	19	27	3	4	No	No
11. Lakeshore Drive/Riverside Dr (SR-74)										
	EBL	150	150	195	193	199	43	4	Yes	Yes
	EBR	225	62	312	106	341	44	29	No	Yes
	WBL	160	64	155	86	142	22	-13	No	No
	NBL	130	138	182	149	185	11	3	Yes	Yes
	SBL	150	159	187	173	204	14	17	Yes	Yes
	SBR[1]	0	54	73	53	76	-1	3	No	No

[1] No turn pocket length.

[2] In Plus Project condition, movement will be shared with a through lane.

- I-15 NB Ramps/Central Avenue (SR-74)

  - NBL pocket length = 100', queue length = 175'
  - NBR pocket length = 100', queue length = 162'
- Dexter Avenue/Central Avenue (SR-74)
  - NBL pocket length = 120', queue length = 142'
- SBR pocket length = 150', queue length = 188'Lakeshore Drive/Riverside Drive (SR-74)
  - EBL pocket length = 150', queue length = 199'
  - EBR pocket length = 225', queue length = 341'
  - NBL pocket length = 130', queue length = 185'
    SBL pocket length = 150', queue length = 204'

Existing plus Ambient Growth plus Project

Table 14 presents the queuing analysis for the Existing and Existing plus Ambient Growth plus Project scenario. This table also illustrates the existing turning pocket length, if available, and the change in the queue length with the addition of the project. It should be noted that all of the queue lengths shown below are also exceeded in the Existing (without project) condition. As shown in Table 14, the following intersections/movements are expected to exceed the existing turn pocket (queue storage) length in the Existing plus Ambient Growth plus Project condition:

- I-15 NB Ramps/Nichols Road
  - NBR pocket length = 50', queue length = 81'
- I-15 SB Ramps/Nichols Road
  - SBR pocket length = 50', queue length = 70'
- Collier Avenue (SR-74)/Hunco Way
  - NBL pocket length = 250', queue length = 270'
  - SBL pocket length = 220', queue length = 326'
- Collier Avenue (SR-74)/Central Avenue (SR-74)
  - EBL pocket length = 150', queue length = 181'
  - NBR pocket length = 50', queue length = 86'
- I-15 SB Ramps/Central Avenue (SR-74)
  - SBL pocket length = 100', queue length = 155'
  - SBR pocket length = 100', queue length = 170'

Table 14. Existing and Existing plus Ambient Growth plus Project Queuing Analysis

			Existing		Existing Plus Ambient Plus Project		Change		Exceeds Turn Pocket Length?	
Intersection	Movement	Existing Pocket Length (feet)	AM	PM	AM	PM	AM	PM	AM	PM
1. I-15 NB Ramps/Nichols Rd										
	EBL	275	41	40	49	46	8	6	No	No
	NBR	50	71	56	81	65	10	9	Yes	Yes
2. I-15 SB Ramps/Nichols Rd										
	EBR	150	88	62	107	59	19	-3	No	No
	WBL	280	47	41	47	66	0	25	No	No
	SBR	50	49	65	65	70	16	5	Yes	Yes
3. Collier Ave (SR-74)/Nichols Rd										
	WBL	135	51	56	57	98	6	42	No	No
4. Collier Ave (SR-74)/Riverside Dr (SR-74)										
	EBL[1]	0	69	96	83	265	14	169	No	No
	EBR[1]	0	157	467	196	996	39	529	No	No
	SBL[2]	6000	11	12	88	934	77	922	No	No
5. Collier Ave (SR-74)/Hunco Way										
	WBL[1]	0	90	174	94	222	4	48	No	No
	WBR[1]	0	36	63	41	96	5	33	No	No
	NBL	250	52	159	56	270	4	111	No	Yes
	SBL	220	67	158	60	326	-7	168	No	Yes
6. Collier Ave (SR-74)/Central Avenue (SR-74)										
	EBL	150	91	100	181	181	90	81	Yes	Yes
	WBL[1]	0	125	100	137	101	12	1	No	No
	NBL	100	116	97	60	72	-56	-25	No	No
	NBR	50	82	84	85	86	3	2	Yes	Yes
	SBL	900	331	734	523	738	192	4	No	No
7. I-15 SB Ramps/Central Ave (SR-74)										
	EBR[1]	0	251	250	273	254	22	4	No	No
	WBL	400	218	153	239	166	21	13	No	No
	SBL	100	123	161	121	155	-2	-6	Yes	Yes
	SBR	100	127	164	140	170	13	6	Yes	Yes
8. I-15 NB Ramps/Central Ave (SR-74)										
	EBL	250	85	121	85	131	0	10	No	No
	NBL	100	173	172	172	171	-1	-1	Yes	Yes
	NBR	100	110	159	107	163	-3	4	Yes	Yes
9. Dexter Ave/Central Ave (SR-74)										
	EBL[1]	0	260	147	262	177	2	30	No	No
	EBR[1]	0	47	47	45	51	-2	4	No	No
	WBL	200	161	182	179	215	18	33	No	Yes
	WBR	300	130	227	138	354	8	127	No	Yes
	NBL	120	123	139	130	132	7	-7	Yes	Yes
	SBL	175	133	80	109	86	-24	6	No	No
	SBR	150	187	126	190	139	3	13	Yes	No
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)										
	EBL	50	16	12	13	27	-3	15	No	No
	WBL	50	17	16	22	24	5	8	No	No
	NBR	50	5	7	0	10	-5	3	No	No
	SBR	50	16	23	0	23	-16	0	No	No
11. Lakeshore Drive/Riverside Dr (SR-74)										
	EBL	150	150	195	178	209	28	14	Yes	Yes
	EBR	225	62	312	160	298	98	-14	No	Yes
	WBL	160	64	155	95	137	31	-18	No	No
	NBL	130	138	182	141	183	3	1	Yes	Yes
	SBL	150	159	187	169	198	10	11	Yes	Yes
	SBR[1]	0	54	73	58	88	4	15	No	No

[1] No turn pocket length.

[2] In Plus Project condition, movement will be shared with a through lane.

- I-15 NB Ramps/Central Avenue (SR-74)
  - NBL pocket length = 100', queue length = 171'
  - NBR pocket length = 100', queue length = 163'
- Dexter Avenue/Central Avenue (SR-74)
  - WBL pocket length = 200', queue length = 215'
  - WBR pocket length = 300', queue length = 354'
  - NBL pocket length = 120', queue length = 132'
  - SBR pocket length = 150', queue length = 190'
- Lakeshore Drive/Riverside Drive (SR-74)
  - EBL pocket length = 150', queue length = 209'
  - EBR pocket length = 225', queue length = 298'
  - NBL pocket length = 130', queue length = 183'
  - SBL pocket length = 150', queue length = 198'

Existing plus Ambient Growth plus Project plus Cumulative Projects

Table 15 presents the queuing analysis for the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario. This table also illustrates the existing turning pocket length, if available, and the change in the queue length with the addition of the project. It should be noted that most of the queue lengths shown below are also exceeded in the Existing condition. As shown in Table 15, the following intersections/movements are expected to exceed the existing turn pocket (queue storage) length in the Existing plus Ambient Growth plus Project plus Cumulative Projects condition:

- I-15 NB Ramps/Nichols Road
  - NBR pocket length = 50', queue length = 86'
- I-15 SB Ramps/Nichols Road
  - SBR pocket length = 50', queue length = 85'
- Collier Avenue/Nichols Road
  - WBL pocket length = 135', queue length = 231'
- Collier Avenue (SR-74)/Hunco Way
  - NBL pocket length = 250', queue length = 279'
  - SBL pocket length = 220', queue length = 312'
- Collier Avenue (SR-74)/Central Avenue (SR-74)
  - EBL pocket length = 150', queue length = 207'
  - NBL pocket length = 100', queue length = 106'
  - NBR pocket length = 50', queue length = 78'
- I-15 SB Ramps/Central Avenue (SR-74)
  - SBL pocket length = 100', queue length = 171'
  - SBR pocket length = 100', queue length = 169'
- I-15 NB Ramps/Central Avenue (SR-74)
  - NBL pocket length = 100', queue length = 168'
  - NBR pocket length = 100', queue length = 154'

Table 15. Existing plus Ambient Growth plus Project plus Cumulative Queuing Analysis

Intersection	Movement	Existing Pocket Length (feet)	Existing Plus Ambient Plus Cumulative Plus Project		Exceeds Turn Pocket Length?	
			AM	PM	AM	PM
1. I-15 NB Ramps/Nichols Rd						
	EBL	275	60	46	No	No
	NBR	50	86	55	Yes	Yes
2. I-15 SB Ramps/Nichols Rd						
	EBR	150	119	77	No	No
	WBL	280	49	170	No	No
	SBR	50	71	85	Yes	Yes
3. Collier Ave (SR-74)/Nichols Rd						
	WBL	135	66	201	No	Yes
4. Collier Ave (SR-74)/Riverside Dr (SR-74)						
	EBL[1]	0	106	235	No	No
	EBR[1]	0	375	986	No	No
	SBL[2]	6000	122	1305	No	No
5. Collier Ave (SR-74)/Hunco Way						
	WBL[1]	0	88	474	No	No
	WBR[1]	0	40	242	No	No
	NBL	250	58	279	No	Yes
	SBL	220	133	312	No	Yes
6. Collier Ave (SR-74)/Central Avenue (SR-74)						
	EBL	150	203	207	Yes	Yes
	WBL[1]	0	310	197	No	No
	NBL	100	106	100	Yes	No
	NBR	50	78	76	Yes	Yes
	SBL	900	735	710	No	No
7. I-15 SB Ramps/Central Ave (SR-74)						
	EBR[1]	0	347	368	No	No
	WBL	400	218	367	No	No
	SBL	100	169	171	Yes	Yes
	SBR	100	169	155	Yes	Yes
8. I-15 NB Ramps/Central Ave (SR-74)						
	EBL	250	142	169	No	No
	NBL	100	168	157	Yes	Yes
	NBR	100	128	154	Yes	Yes
9. Dexter Ave/Central Ave (SR-74)						
	EBL[1]	0	295	227	No	No
	EBR[1]	0	48	118	No	No
	WBL	200	274	263	Yes	Yes
	WBR	300	425	343	Yes	Yes
	NBL	120	147	146	Yes	Yes
	SBL	175	150	122	No	No
	SBR	150	202	185	Yes	Yes
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)						
	EBL	50	18	19	No	No
	WBL	50	22	15	No	No
	NBR	50	12	8	No	No
	SBR	50	41	25	No	No
11. Lakeshore Drive/Riverside Dr (SR-74)						
	EBL	150	227	250	Yes	Yes
	EBR	225	326	356	Yes	Yes
	WBL	160	177	193	Yes	Yes
	NBL	130	147	181	Yes	Yes
	NBR	300	84	334	No	Yes
	SBL	150	199	178	Yes	Yes
	SBR[1]	0	52	63	No	No

[1] No turn pocket length.

[2] In Plus Project condition, movement will be shared with a through lane.

- Dexter Avenue/Central Avenue (SR-74)
    - WBL pocket length = 200', queue length = 274'
    - WBR pocket length = 300', queue length = 425'
    - NBL pocket length = 120', queue length = 147'
    - SBR pocket length = 150', queue length = 202'
- Lakeshore Drive/Riverside Drive (SR-74)
    - EBL pocket length = 150', queue length = 250'
    - EBR pocket length = 225', queue length = 356'
    - WBL pocket length = 160', queue length = 193'
    - NBL pocket length = 130', queue length = 181'
    - NBR pocket length = 300', queue length = 334'
    - SBL pocket length = 150', queue length = 199'

Collier Avenue (SR-74)/Central Avenue (SR-74) Conceptual Geometry

Per the City's General Plan Roadway Classifications (Figure 2.3 of General Plan), Collier Avenue, north of Riverside Drive (along the project's frontage), is classified as a Major roadway with four lanes and a 100 foot right-of-way (80 feet, curb-to-curb). Riverside Drive (SR-74), west of Collier Avenue (along the project's frontage), is classified as an Urban Arterial with six lanes and a 120 foot right-of-way (96 feet, curb-to-curb). Figure 3 above, illustrates the street cross sections for a Major roadway and Urban Arterial.

Currently, Collier Avenue, along the project's frontage, is not constructed to its ultimate Major roadway width of 80 feet, curb-to-curb. It is approximately 76 feet, curb-to-curb. Based on review of the project site plan, the proposed project will dedicate approximately 10 feet in order to allow their half-section of Collier Avenue to be consistent with the Major roadway (half) cross section (center median, two travel lanes, six foot bike lane, and 5 foot sidewalk – in one direction). Street improvements on the west side of Collier Avenue, along the project's frontage, will conform with City roadway design standards.

These improvements will be constructed to be consistent with the General Plan and the City's Standard Plans.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). With the street dedication on the north side (project frontage), the pavement width would be approximately 74 feet (48 feet from curb face to new centerline, plus 26 feet of existing pavement on the south side of the street). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

On-site Truck Turning Radii

As shown in the project site plan above (Figure 2), truck turning templates for a semi-trailer truck (heavy truck) or fuel transport truck have been placed on the two driveways (driveway on Riverside Drive, and driveway on Collier Avenue). The truck turning templates have also been placed at the (underground) fuel storage tanks on site. All truck turning templates show there is adequate space on the project site for a large trailer truck and recreational vehicles (RVs) to maneuver through the site, and through the primary driveways.

Furthermore, the proposed project is not designed, nor intended, to serve heavy, long-haul trucks, but mainly to serve local residents, visitors, and RVs traveling through the area (on I-15 or SR-74). Also, fuel distribution trucks typically arrive at the site to refill the underground storage tanks during the off-peak hours of the business (i.e., late nights, or early mornings).

Class II Bicycle Lane on Riverside Drive (SR-74)

As previously discussed, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). With the street dedication on the north side (project frontage), the pavement width would be approximately 74 feet (48 feet from curb face to new centerline, plus 26 feet of existing pavement on the south side of the street). Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, include a new six foot wide bike lane (Class (II – striped, on-pavement) consistent with the City's General Plan Circulation Element.

Pedestrian Safety Analysis

As shown on the project site plan (Figure 2), pedestrian facilities, in the form of sidewalks, are proposed along the project's frontages on Collier Avenue and Riverside Drive. These sidewalks are shown to be 5 feet in width on Collier Avenue and 6 feet in width on Riverside Drive; and, will be constructed to be consistent with Caltrans and the City's Standard Plans. The proposed sidewalk on the west side of Collier Avenue would connect to the existing sidewalk north of the project site, which provides continuous pedestrian access to the adjacent retail and industrial uses, including the Outlets at Lake Elsinore, further to the north. The proposed sidewalk on the north side of Riverside Drive would be constructed just along the project frontage, as there are no other existing pedestrian facilities to connect with west of the project site.

On site, pedestrian connections, in the form of landscape cut-outs connected to striped crosswalks, are provided adjacent to the gas station convenience mart (on Collier Avenue), and adjacent to the fast-food restaurant (on Riverside Drive). Pedestrians using these connections from the sidewalks on Collier Avenue and Riverside Drive would have direct access to those buildings. Additionally, pedestrian crosswalks and internal sidewalks are provided from each building (convenience mart and fast-food restaurant) to their respective trash enclosure areas. The locations of these crosswalks provide the shortest path from the buildings to the trash enclosures, reducing the length of time employees are in vehicle paths while going to the trash enclosures.

Furthermore, the on-site parking areas have been designed to be as close to the buildings as possible, and the buildings have surrounding sidewalks to keep patrons off the vehicle drive aisles.

Chapter 9. Mitigation Measures and Fair-Share

This section discusses the mitigation measures and fair share costs for the impacted intersections discussed in the previous sections. As mentioned before, the project impacts the following intersections under the Existing plus Project scenario:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Project is 100% responsible for improvements to mitigate impact
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The project impacts the following intersections under the Existing plus Ambient Growth plus Project scenario:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
    - Project is 100% responsible for improvements to mitigate impact
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Project is 100% responsible for improvements to mitigate impact
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The project impacts the following intersections under the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario:

- I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
- Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
- I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
- Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

These intersections will be required to be mitigated to a level of less than significant per the City's significance criteria. The fair share calculations will be assessed with the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario. The mitigation measures for the Existing plus Project and Existing plus Ambient Growth plus Project conditions and the Existing plus Ambient Growth plus Project plus Cumulative projects condition are listed in Figures 14 and 15, respectively.

The incorporation of the mitigation measures defined below would reduce the proposed project's impacts to a level of less than significant per the City's significance criteria.

Existing plus Project

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:

    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during the PM peak hour.

Table 16 presents the LOS (improvement) with the implementation of the mitigation measures listed above for the Existing plus Project condition.

Existing plus Ambient Growth plus Project

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS B during the PM peak hour.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the PM peak hour.

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Table 17 presents the LOS (improvement) with the implementation of the mitigation measures listed above for the Existing plus Ambient Growth plus Project condition.

Existing plus Ambient Growth plus Project plus Cumulative Projects

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the AM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during both the AM and PM.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS C during the PM peak hour.
- Collier Avenue (SR-74)/Riverside Drive (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Restripe two southbound through lanes to one southbound through and one southbound through-left lane. With this mitigation, the intersection is forecast to operate at LOS D during both the AM and PM peak hour.
- I-15 SB Ramps/Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Install a third eastbound through lane and install a second (dual) southbound left turn lane. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Dexter Avenue /Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Change northbound left turn phasing to protected-permitted. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

Table 18 presents the LOS (improvement) with the implementation of the mitigation measures listed above for the Existing plus Ambient Growth plus Project plus Cumulative Projects condition.

Table 16. Existing plus Project LOS with Mitigation Measures

	Existing plus Project				Mitigated				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**148.5**	**F**	27.6	D	24.0	C	--	--	-124.5	--	NO	NO
3. Collier Avenue/Nichols Road	21.8	C	**35.9**	**E**	--	--	14.3	B	--	-21.6	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**65.9**	**F**	**217.8**	**F**	8.0	A	8.9	A	-57.9	-208.9	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010. Unless otherwise noted.

Table 17. Existing plus Ambient Growth plus Project LOS with Mitigation Measures

	Existing plus Ambient Growth plus Project				Mitigated				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**228.7**	**F**	**37.7**	**E**	29.7	D	13.1	B	-199.0	-24.6	NO	NO
3. Collier Avenue/Nichols Road	23.8	C	**44.0**	**E**	--	--	15.4	C	--	-28.6	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**83.0**	**F**	**314.2**	**F**	8.6	A	9.9	A	-74.4	-304.3	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010. Unless otherwise noted.

Table 18. Existing plus Ambient Growth plus Project plus Cumulative Projects LOS with Mitigation Measures

	Existing plus Ambient Growth plus Cumulative Project				Mitigated				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**508.9**	**F**	**103.8**	**F**	13.4	B	11.5	B	-495.5	-92.3	NO	NO
3. Collier Avenue/Nichols Road	**36.3**	**E**	**115.6**	**F**	27.4	D	22.8	C	-8.9	-92.8	NO	NO
6. Collier Ave (SR-74)/Central Avenue (SR-74)	**70.2**	**E**	**60.4**	**E**	45.8	D	36.9	D	-24.4	-23.5	NO	NO
7. I-15 SB Ramps/Central Avenue (SR-74)	43.0	D	**96.3**	**F**	--	--	35.0	C	--	-61.3	NO	NO
9. Dexter Avenue/Central Avenue (SR-74)	**57.1**	**E**	53.0	D	44.9	D	--	--	-12.2	--	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**612.3**	**F**	**3328.7**	**F**	11.7	B	27.3	C	-600.6	--	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.

Project Fair Share Costs

The following section discusses the project's fair share costs for the improvements noted above. The fair share calculation is based on the following formula, and uses the Existing plus Ambient Growth plus Project plus Cumulative Projects condition:

$$\frac{Project\ Traffic}{Opening\ Year + Project - Existing\ Traffic}$$

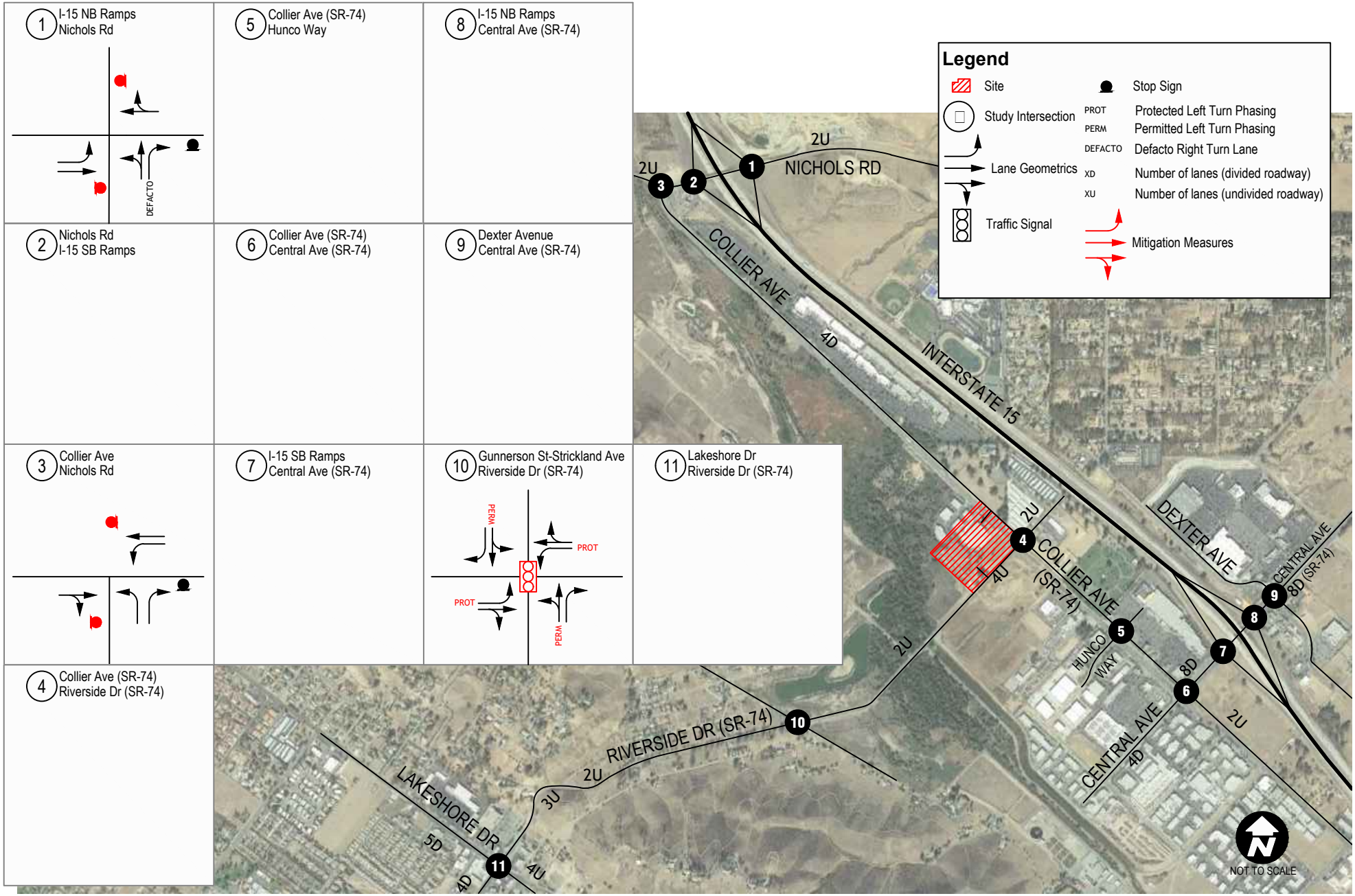
As shown in Table 19, the project fair share ranges from 0.9 percent to 12.5 percent. It is expected that the project is expected to pay its fair share costs for the mitigation measures noted previously.

A similar calculation was conducted for the impacted roadway segment of Collier Avenue, south of Riverside Drive (SR-74). Based on the daily traffic volumes shown in Table 11, the project's fair share would be 9.6 percent (1,056 Project ADT/ (38,844 – 27,790)). Another calculation was conducted for Riverside Drive (SR-74), west of Collier Avenue. Based on the daily traffic volumes shown in Table 11, the project's fair share would be 5.2 percent (540 Project ADT/ (36,809 – 26,360. The roadway segment of Riverside Drive west of Collier Avenue is part of the TUMF network and is to be improved to its ultimate width using those funds.

Table 19. Project Fair Share

Existing Plus Ambient Growth Plus Cumulative Plus Project	AM Peak				PM Peak			
Intersection	Project Traffic	Cumulative Plus Project	Existing	Fair Share %[1]	Project Traffic	Cumulative Plus Project	Existing	Fair Share %[1]
1. I-15 NB Ramps/Nichols Rd	19	1009	854	12.3%	22	900	724	12.5%
3. Collier Ave/Nichols Rd	39	1159	848	12.5%	45	1417	1057	12.5%
4. Collier Ave (SR-74)/Riverside Dr (SR-74)	81	2477	1668	10.0%	92	3482	2387	8.4%
6. Collier Ave (SR-74)/Central Ave (SR-74)	71	4859	3452	5.0%	81	5194	3400	4.5%
7. I-15 SB Ramps/Central Ave (SR-74)	68	5226	3531	4.0%	77	6560	4281	3.4%
9. Dexter Avenue/Central Ave (SR-74)	20	5736	3956	1.1%	22	7211	4637	0.9%
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)	20	2123	1462	3.0%	22	2798	1897	2.4%

[1] Project Traffic/(Existing + Ambient Growth + Cumulative + Project - Existing Traffic)

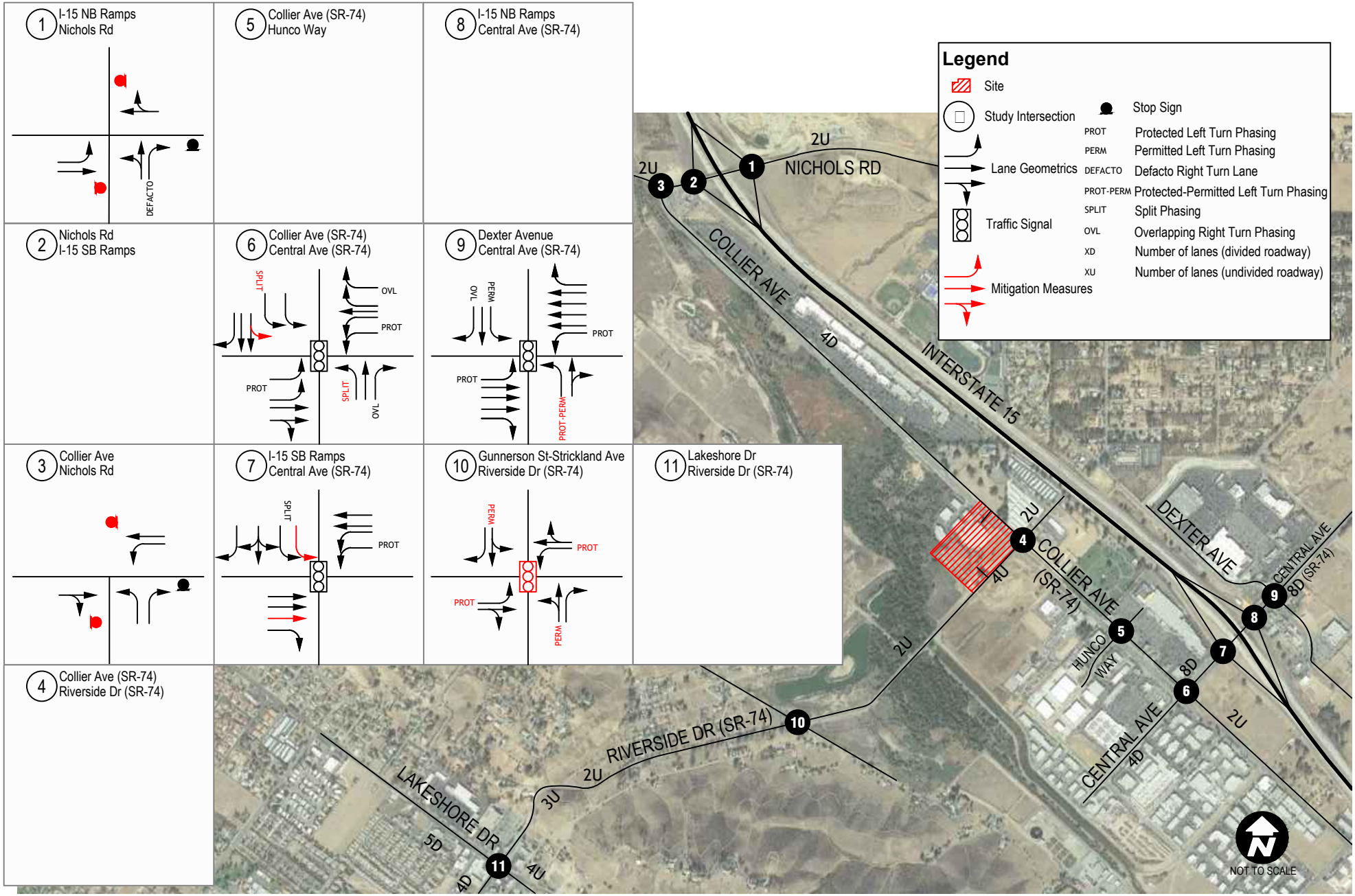


Source: Google Maps, 10/2016

Mitigation Measures □or E□isting plus Project □ E□isting plus □m□ient Gro□t□ plus Project Scenarios

FIGURE **14**

Kassab Travel Center TIA



Source: Google Maps, 10/2016

Mitigation Measures □or E□isting plus □m□ient Gro□t□ plus Project plus Cumulative Projects Scenario

FIGURE 15

Kassab Travel Center TIA

Chapter 10. Findings and Recommendations

This chapter of the transportation impact study summarizes the project traffic analysis for the proposed Kassab Travel Center in the City of Lake Elsinore. General findings and recommendations include:

- The proposed project is proposing an 18 fueling position gas station with convenience mart; and, a 2,543 square foot fast-food restaurant with a drive-through. This project is expected to generate a net of 1,919 daily trips, 129 AM peak hour trips (65 inbound and 64 outbound), and 148 PM peak hour trips (75 inbound and 73 outbound).

- Under the Existing plus Project conditions, the following intersections would be impacted as they would operate below the City's LOS standard of LOS D:
    - I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
    - Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

- Under the Existing plus Ambient Growth plus Project conditions, the following intersections would be impacted as they would operate below the City's LOS standard of LOS D:
    - I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
    - Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

- Under the Existing plus Ambient Growth plus Project plus Cumulative Projects condition, the following intersections would be impacted as they would operate below the City's LOS standard of LOS D:
    - I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
    - Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
    - I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
    - Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

- The following mitigation measures are proposed to improve the LOS at the impacted intersections. These mitigation measures are proposed for the Existing plus Project scenario:
    - Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:
        - I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
            - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
        - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) – The peak hour volumes at this intersection would not satisfy the peak

hour signal warrant. The following improvement is needed to mitigate intersection LOS:

- Convert this intersection into a signalized intersection. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

- Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:
  - Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:

    Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during the PM peak hour.

- The following mitigation measures are proposed to improve the LOS at the impacted intersections. These mitigation measures are proposed for the Existing plus Ambient Growth plus Project scenario:
  - Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
      - Convert this intersection into a signalized intersection. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.
  - Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:
    - I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
      - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS B during the PM peak hour.
    - Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
      - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the PM peak hour.

- The following mitigation measures are proposed to improve the LOS at the impacted intersections. These mitigation measures are proposed for the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario:
  - Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the AM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement is needed to mitigate intersection LOS:
  - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during both the AM and PM.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
  - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS C during the PM peak hour.
- Collier Avenue (SR-74)/Riverside Drive (SR-74) – The following improvement is needed to mitigate intersection LOS:
  - Restripe two southbound through lanes to one southbound through and one southbound through-left lane. With this mitigation, the intersection is forecast to operate at LOS D during both the AM and PM peak hour.
- I-15 SB Ramps/Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
  - Install a third eastbound through lane and install a second (dual) southbound left turn lane. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Dexter Avenue /Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
  - Change northbound left turn phasing to protected-permitted. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
  - Convert this intersection into a signalized intersection. With this mitigation, the intersection is forecast to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

- The project's fair share percentages range from 0.9 percent through 12.5 percent for the intersection improvements discussed above.

- All roadway segments operate at LOS D or better and would operate within the City's standard of LOS D, except for Riverside Drive (SR-74), west of Collier Avenue. This segment is currently operating at LOS E-F under existing conditions, and is forecast to continue to operate at LOS E-F under Existing plus Ambient Growth plus Project conditions, as well as with the addition of traffic from cumulative projects (Existing plus Ambient Growth plus Project plus Cumulative Projects). Collier Avenue, south of Riverside Drive (SR-74) in the Existing plus Ambient Growth plus Project plus

Cumulative Projects condition is forecast to degrade to LOS F with the addition of Cumulative Project traffic.

The project will restripe the southbound approach at Collier Avenue/Riverside Drive (SR-74) to consist of one right lane and one shared-left lane in order to construct an additional northbound left-turn lane for the Collier Avenue driveway.

The Project will provide two driveways, along Riverside Drive (SR-74) and Collier Avenue. As per discussion with Caltrans, the Riverside Drive driveway will be restricted to right in right out movements. The Collier Avenue driveway, as per approval from the City, will be constructed as a full access driveway with two approaching southbound lanes, and one northbound left turn lane providing access to the site. For both driveways there will be one lane for entering and one lane for exiting, with a width of 50 feet, providing ample space for larger vehicles to enter the site without restricting vehicles exiting. See Figure 2 for more information.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.
The roadway segment of Riverside Drive, west of Collier Avenue is part of the TUMF network and is to be improved to its ultimate width using those funds. However, with the project improvements listed above, and the addition of project traffic (approximately 540 ADT), this segment of Riverside Drive (SR-74) is forecast to continue to operate at LOS E-F under both conditions. The project's fair share percentage for the roadway segment of Riverside Drive (SR-74), west of Collier Avenue would be 5.2 percent. Collier Avenue, south of Riverside Drive (SR-74), with the addition of project traffic (approximately 1,056 ADT), this segment of Collier Avenue (SR-74) is forecast to continue to operate LOS E-F under Existing plus Ambient Growth plus Project conditions. The project's fair share percentage for the roadway segment of Collier Avenue, south of Riverside Drive (SR-74) would be 9.6 percent.

Appendix A: Scoping Agreement

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the Riverside County Transportation Department requirements for traffic impact analysis of the following project. The analysis must follow the Riverside County Transportation Department Traffic Study Guidelines dated February 2005.

Case No. (i.e. TR, PM, CUP, PP) 2016-112 Kassab Travel C
Related Cases -
SP No. *Provide SP No. and list of other approved or active projects within the SP.*
EIR No.
GPA No.
CZ No.
Project Name: Kassab Travel Center
Project Address: 29301 Riverside Drive (southwest corner of Collier Avenue/Riverside Drive), Lake Elsinore, CA
Project Description: 18 pump gas station with 6,000 SF convenience store containing three quick serve restaurants; and, 2,543 SF fast food restaurant with drive-through

	Consultant	Developer
Name:	Transpo Group	Ken Kassab
Address:	603 N. Park Center Drive, Suite 108	c/o Environmental Advisors
	Santa Ana, CA 92705	Josh Haskins
Telephone:	949-656-7908	2400 E. Katella Avenue, Suite 800
Fax:		Anaheim, CA 92806

A. Trip Generation Source: ITE Trip Generation, 9th Edition (2012)

Current GP Land Use *Provide General Plan Land Use Designation (e.g.: MDR, C* Limited Industrial
Proposed Land Use Commercial
Current Zoning Commercial Manufacturing
Proposed Zoning Commercial Manufacturing

Current Trip Generation	In	Out	Total	Proposed Trip Generation In	Out	Total
AM Trips	None	None	None	65	64	129
PM Trips	None	None	None	75	73	148

Internal Trip Allowance ☐ Yes ☑ No (____ % Trip Discount)
Pass-By Trip Allowance ☑ Yes ☐ No (See Table 1 - Trip Generation % Trip Discount)

A passby trip discount of 25% is allowed for appropriate land uses. The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: (attach exhibit for detailed assignment) N % S % E % W %
Please see attached exhibits

C. Background Traffic

Project Build-out Year: *Provide realistic opening year, considering time needed for approvals and construction.* *2019*
Annual Ambient Growth Rate: ____ % To be provided by County Staff
Phase Year(s) ____
Other area projects to be analyzed: To be provided by City staff

Model/Forecast methodology Existing traffic plus growth rate plus traffic from other area projects (cumulative projects)

D. Study intersections: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. I-15 NB ramps/Nichols Road
2. I-15 SB ramps/Nichols Road
3. Collier Avenue/Nichols Road
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)
5. Collier Avenue (SR-74)/Hunco Way
6. Collier Avenue (SR-74)/Central Avenue (SR-74)
7. I-15 SB ramps/Central Avenue (SR-74)
8. I-15 NB ramps/Central Avenue (SR-74)
9. Dexter Avenue/Central Avenue (SR-74)
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)

E. Study Roadway Segments: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. Riverside Drive (SR-74), west of Collier Avenue
2. Collier Avenue, north of Riverside Drive (SR-74)
3. Collier Avenue, south of Riverside Drive (SR-74)
4.
5.
6.
7.
8.
9.
10.

E. Other Jurisdictional Impacts

Is this project within a City's Sphere of Influence or one-mile radius of City boundaries? ■ Yes ☐ No

If so, name of City Jurisdiction: City of Lake Elsinore; Riverside County

F. Site Plan (please attach reduced copy)

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Transportation Department)
(NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing unsignalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.
Date of counts Intersection traffic count data from October 2016 and May 2017 (while all adjacent schools were in session). One historical count adjusted via surrounding volumes.

***NOTE* Traffic Study Submittal Form and appropriate fee must be submitted with, or prior to submittal of this form. Transportation Department staff will not process the Scoping Agreement prior to receipt of the fee.**

Recommended by:

Dennis Pascua — 7/12/2017
Consultant's Representative — Date

Approved Scoping Agreement:

Riverside County Transportation Department — Date

Scoping Agreement Submitted on _____

Revised on _____

Table 1. Project Trip Generation

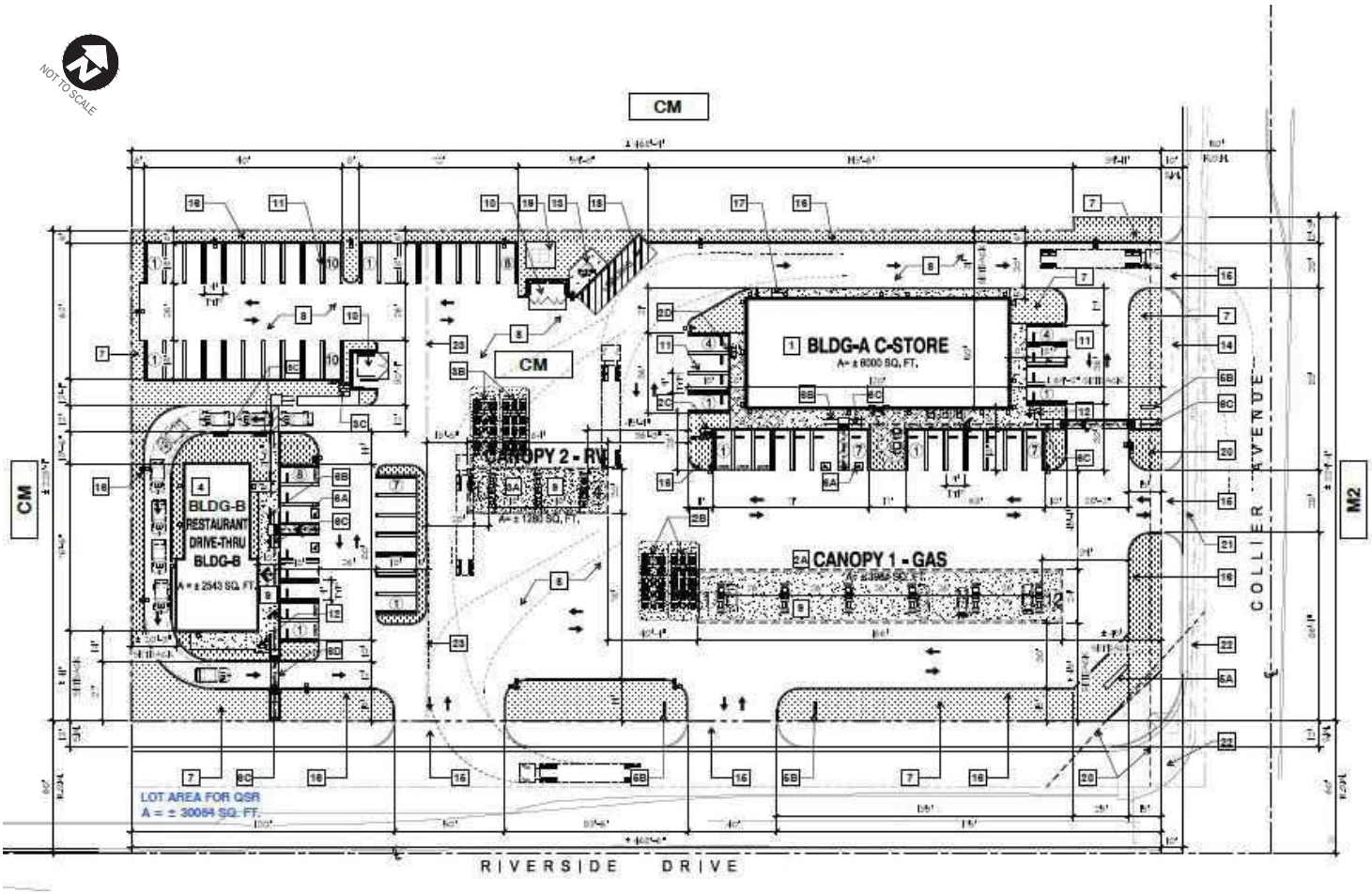
Land Use		Units	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Trip Rates									
Fast-Food Restaurant with Drive-Through Window [1]		TSF	496.12	23.16	22.26	45.42	16.98	15.67	32.65
Gasoline/Service Station with Convenience Market [2]		VFP	162.78	5.08	5.08	10.16	6.76	6.76	13.51
Project Trip Generation									
Fast-Food Restaurant with Drive-Through Window	2.54	TSF	1,260	59	57	115	43	40	83
Passby (49% AM/Daily, 50% PM) [3]			-630	-29	-28	-57	-22	-20	-41
NET			630	30	29	59	22	20	41
Gas Station & Convenience Market	18	VFP	2,930	91	91	183	122	122	243
Passby (62% AM/Daily, 56% PM) [3]			-1,641	-57	-57	-113	-68	-68	-136
NET			1,289	35	35	69	53	53	107
Total Trip Generation			4,190	150	148	298	165	161	326
NET Trip Generation			1,919	65	64	129	75	73	148

TSF = Thousand Square Feet, VFP = Vehicle Fueling Positions

[1] Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 934 - Fast-Food Restaurant with Drive-Through Window.

[2] Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 945 - Gasoline/Service Station with Convenience Market

[3] Pass-by percentages based on rates/equations obtained from the Trip Generation Handbook, 2nd Edition, ITE, 2004.



Project Site Plan

FIGURE 1

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Table 1. Project Trip Generation

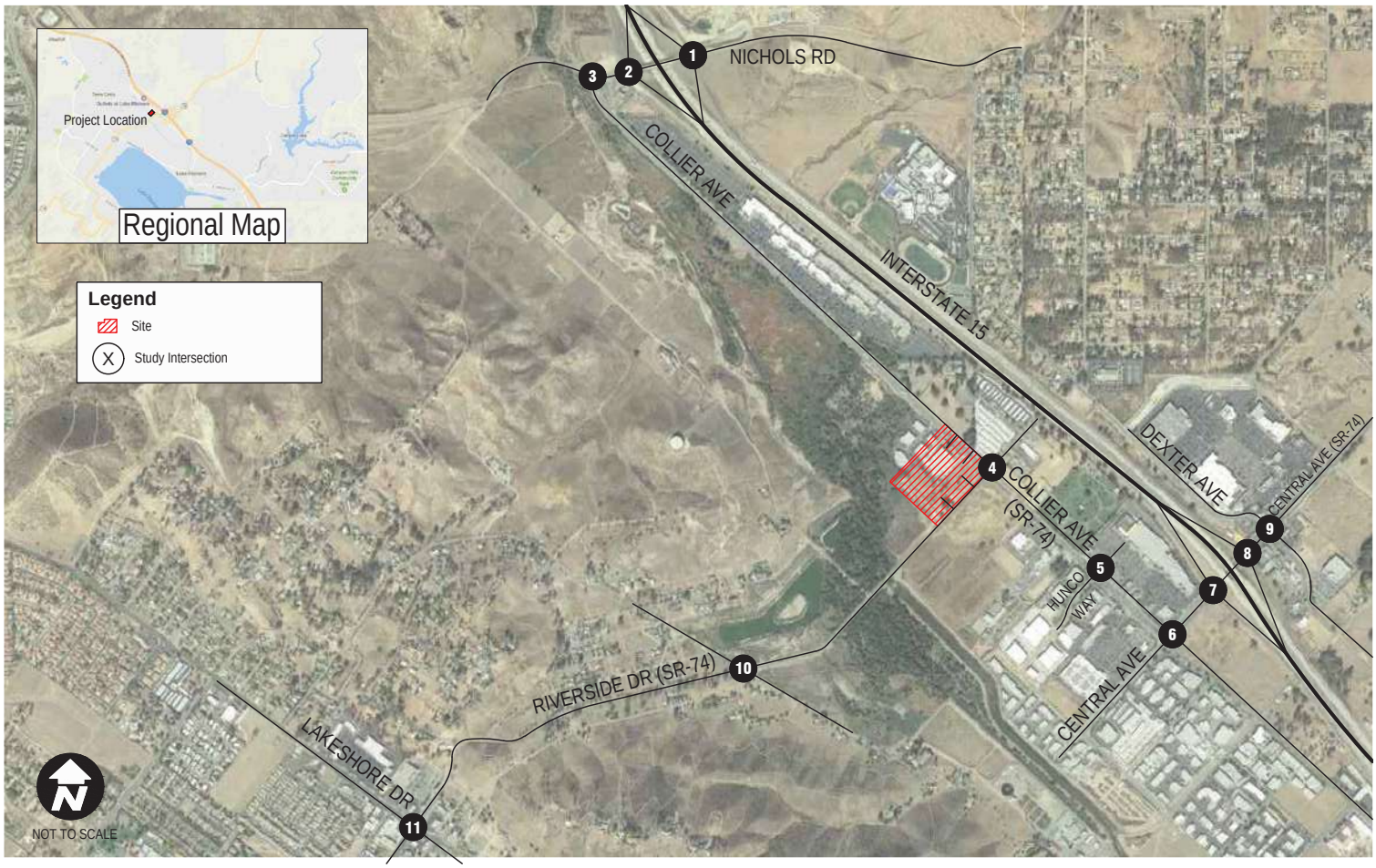
Land Use		Units	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Trip Rates									
Fast-Food Restaurant with Drive-Through Window [1]		TSF	496.12	23.16	22.26	45.42	16.98	15.67	32.65
Gasoline/Service Station with Convenience Market [2]		VFP	162.78	5.08	5.08	10.16	6.76	6.76	13.51
Project Trip Generation									
Fast-Food Restaurant with Drive-Through Window	2.54	TSF	1,260	59	57	115	43	40	83
Passby (49% AM/Daily, 50% PM) [3]			-630	-29	-28	-57	-22	-20	-41
NET			630	30	29	59	22	20	41
Gas Station & Convenience Market	18	VFP	2,930	91	91	183	122	122	243
Passby (62% AM/Daily, 56% PM) [3]			-1,641	-57	-57	-113	-68	-68	-136
NET			1,289	35	35	69	53	53	107
Total Trip Generation			4,190	150	148	298	165	161	326
NET Trip Generation			1,919	65	64	129	75	73	148

TSF = Thousand Square Feet, VFP = Vehicle Fueling Positions

[1] Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 934 - Fast-Food Restaurant with Drive-Through Window.

[2] Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 945 - Gasoline/Service Station with Convenience Market

[3] Pass-by percentages based on rates/equations obtained from the Trip Generation Handbook, 2nd Edition, ITE, 2004.



Source: Google Maps, 10/2016

Project Site Location and Study Area

FIGURE **2**

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Jun 09, 2017 - 2:21pm mladenp C:\Users\mladenp\Dropbox (Transpo CA)\Transpo CA Team Folder\Projects\2017\17143.PR - Kassab Travel Center Lake Elsinore\Graphics\Base_KassabTravelCenter.dwg Layout: Fig2-StudyArea

Source: Google Maps, 10/2016

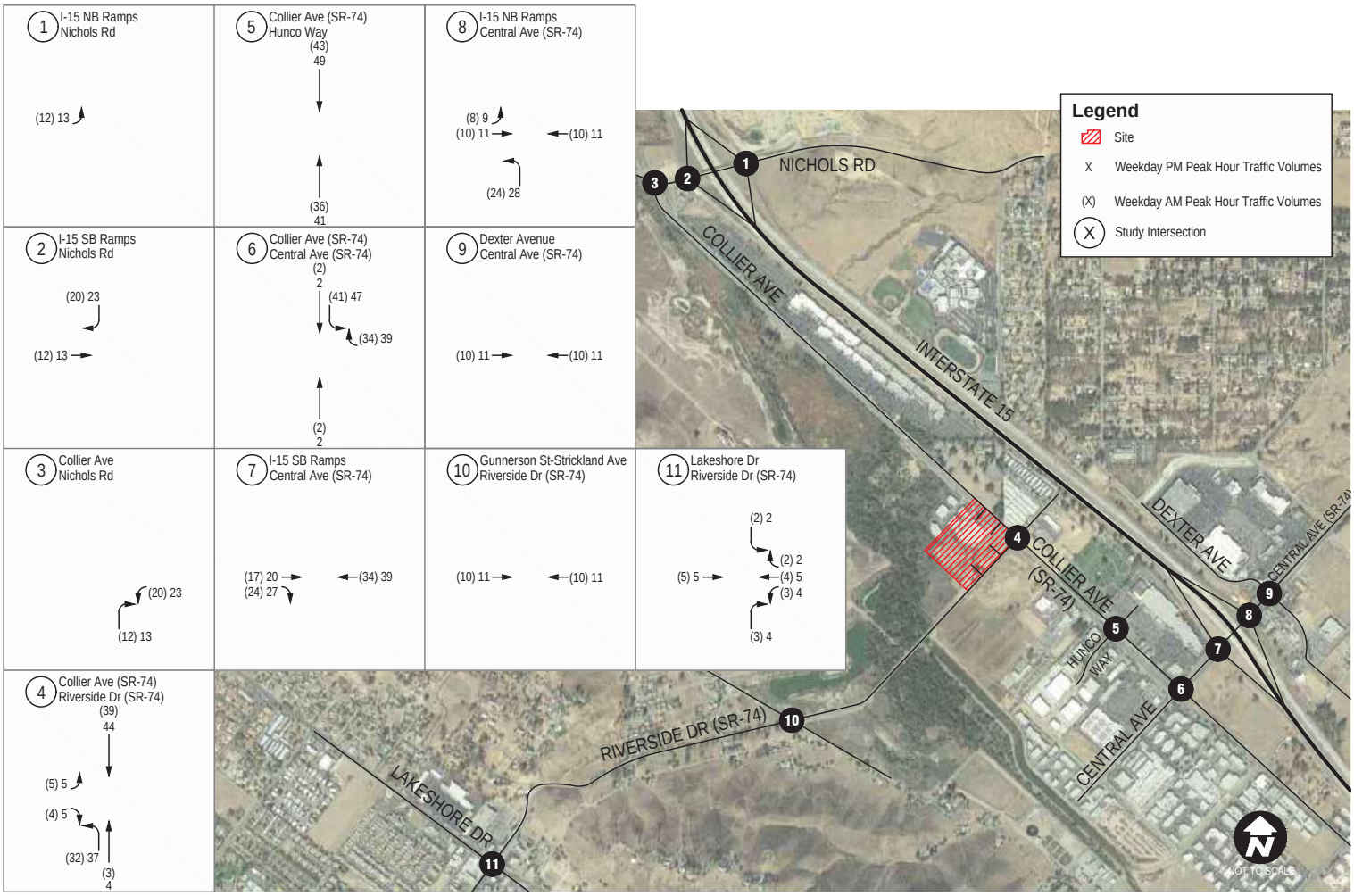
Project Trip Distribution

FIGURE 3

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Jun 09, 2017 - 2:22pm mladenp C:\Users\mladenp\Dropbox (Transpo CA)\Transpo CA Team Folder\Projects\2017\17143.PR - Kassab Travel Center Lake Elsinore\Graphics\Base_KassabTravelCenter.dwg Layout: Fig3-ProjDist



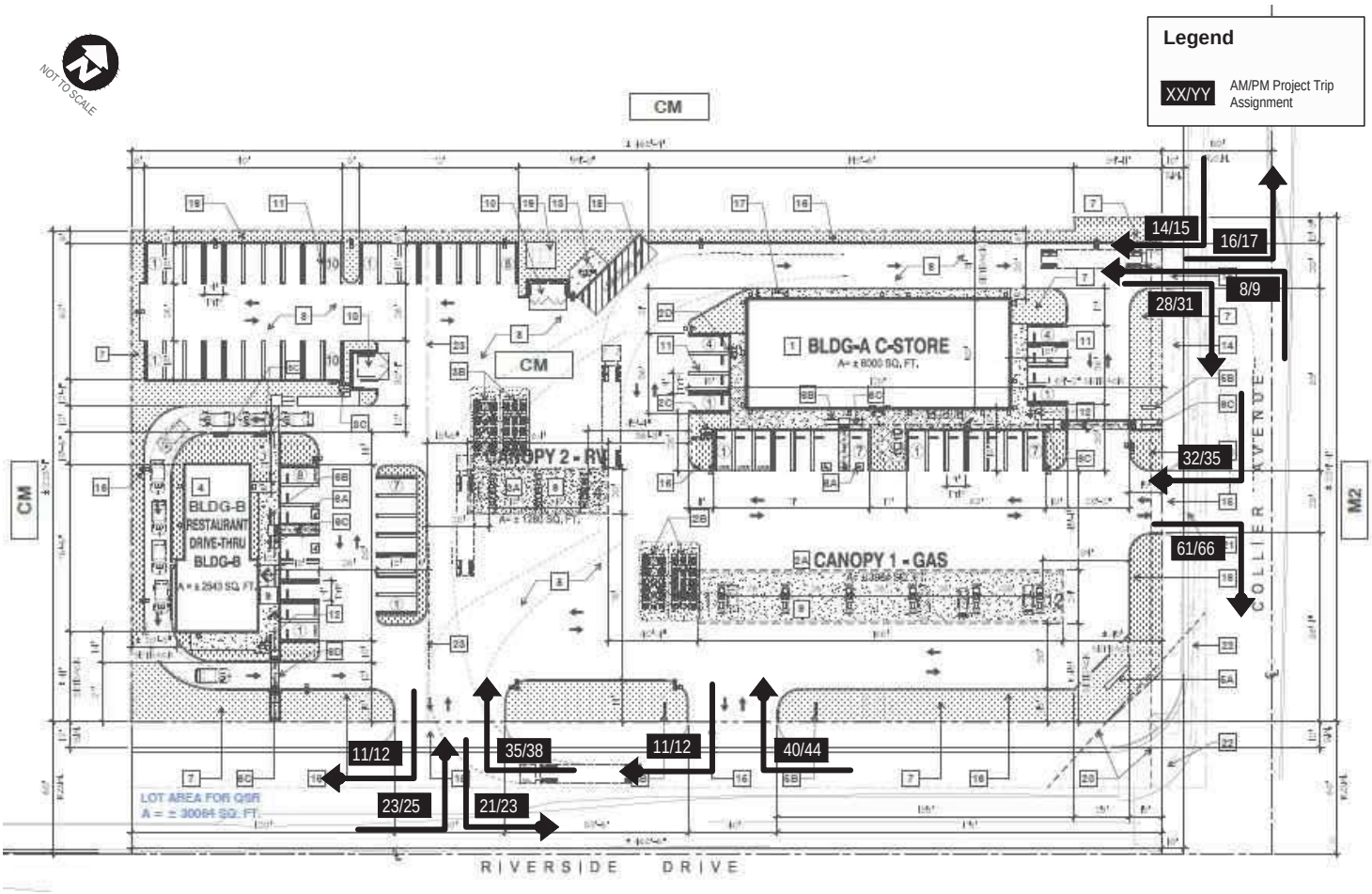
Source: Google Maps, 10/2016

Project Net Total Trip Assignment

FIGURE 4

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.



Project Driveway Trip Assignment

FIGURE **5**

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Jun 08, 2017 - 5:34pm mladenp C:\Users\mladenp\Dropbox (Transpo CA)\Transpo CA Team Folder\Projects\2017\17143.PR - Kassab Travel Center Lake Elsinore\Graphics\Base_KassabTravelCenter.dwg Layout: Fig5-ProjPassbyDwy

Appendix B: Traffic Counts

INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: I-15 NB Ramp
EAST & WEST: Nichols

PROJECT #: SC1114
LOCATION #: 3
CONTROL: STOP N

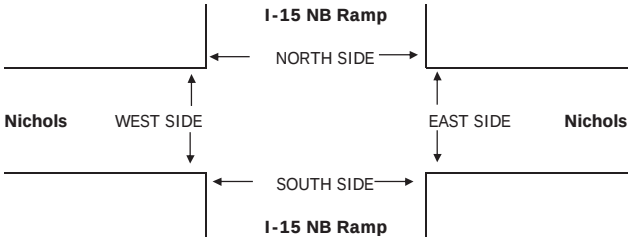
NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

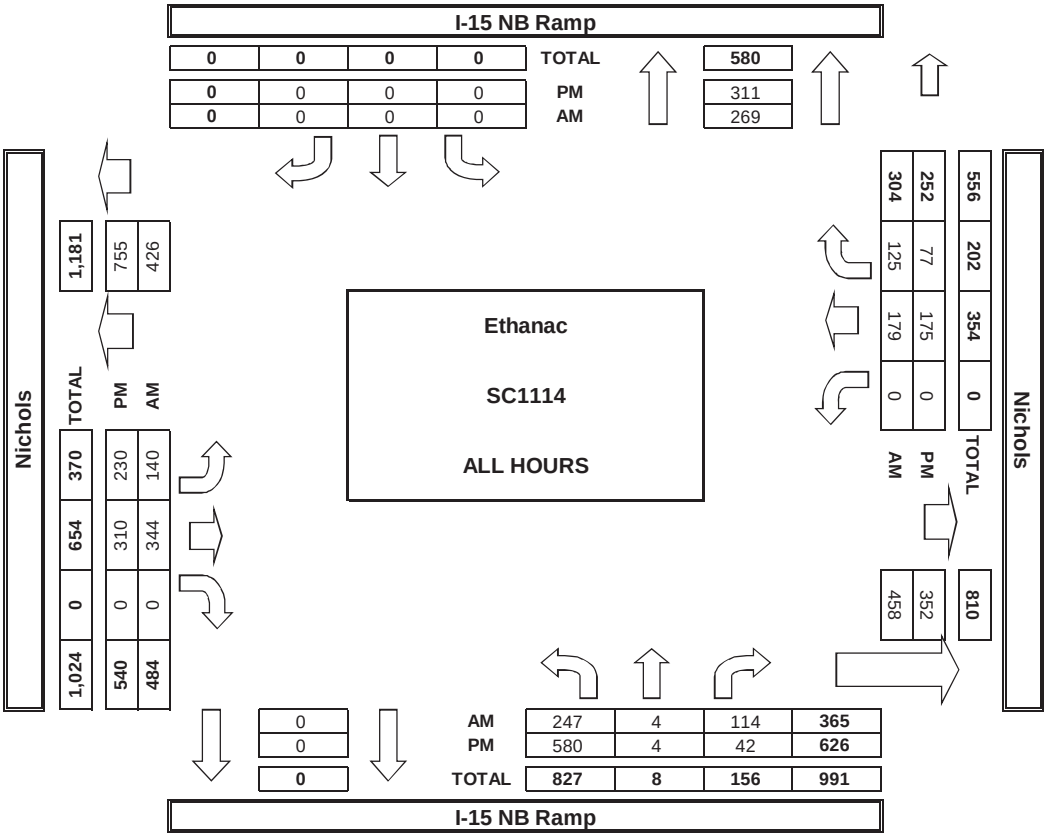
		NORTHBOUND I-15 NB Ramp			SOUTHBOUND I-15 NB Ramp			EASTBOUND Nichols			WESTBOUND Nichols				U-TURNS				
	LANES:	NL 0	NT 1	NR 0	SL X	ST X	SR X	EL 1	ET 1	ER X	WL X	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	40	0	58	0	0	0	17	154	0	0	35	36	340	0	0	0	0	0
	7:15 AM	51	0	29	0	0	0	15	93	0	0	62	30	280	0	0	0	0	0
	7:30 AM	37	1	3	0	0	0	20	29	0	0	37	27	154	0	0	0	0	0
	7:45 AM	26	0	2	0	0	0	20	17	0	0	11	4	80	0	0	0	0	0
	8:00 AM	26	0	6	0	0	0	14	21	0	0	9	7	83	0	0	0	0	0
	8:15 AM	25	1	6	0	0	0	12	17	0	0	11	9	81	0	0	0	0	0
	8:30 AM	16	1	5	0	0	0	29	3	0	0	7	5	66	0	0	0	0	0
	8:45 AM	26	1	5	0	0	0	13	10	0	0	7	7	69	0	0	0	0	0
	VOLUMES	247	4	114	0	0	0	140	344	0	0	179	125	1,153	0	0	0	0	0
	APPROACH %	68%	1%	31%	0%	0%	0%	29%	71%	0%	0%	59%	41%						
	APP/DEPART	365	/	269	0	/	0	484	/	458	304	/	426	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	154	1	92	0	0	0	72	293	0	0	145	97	854					
	APPROACH %	62%	0%	37%	0%	0%	0%	20%	80%	0%	0%	60%	40%						
	PEAK HR FACTOR		0.630			0.000			0.534			0.658		0.628					
	APP/DEPART	247	/	170	0	/	0	365	/	385	242	/	299	0					
PM	4:00 PM	71	0	4	0	0	0	29	49	0	0	16	10	179	0	0	0	0	0
	4:15 PM	53	1	6	0	0	0	35	42	0	0	17	5	159	0	0	0	0	0
	4:30 PM	62	0	9	0	0	0	39	30	0	0	25	13	178	0	0	0	0	0
	4:45 PM	73	0	9	0	0	0	31	40	0	0	26	7	186	0	0	0	0	0
	5:00 PM	71	2	3	0	0	0	23	49	0	0	22	15	185	0	0	0	0	0
	5:15 PM	71	0	3	0	0	0	31	35	0	0	24	11	175	0	0	0	0	0
	5:30 PM	81	1	5	0	0	0	23	25	0	0	26	10	171	0	0	0	0	0
	5:45 PM	98	0	3	0	0	0	19	40	0	0	19	6	185	0	0	0	0	0
	VOLUMES	580	4	42	0	0	0	230	310	0	0	175	77	1,418	0	0	0	0	0
	APPROACH %	93%	1%	7%	0%	0%	0%	43%	57%	0%	0%	69%	31%						
	APP/DEPART	626	/	311	0	/	0	540	/	352	252	/	755	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	277	2	24	0	0	0	124	154	0	0	97	46	724					
	APPROACH %	91%	1%	8%	0%	0%	0%	45%	55%	0%	0%	68%	32%						
	PEAK HR FACTOR		0.924			0.000			0.965			0.941		0.973					
	APP/DEPART	303	/	172	0	/	0	278	/	178	143	/	374	0					

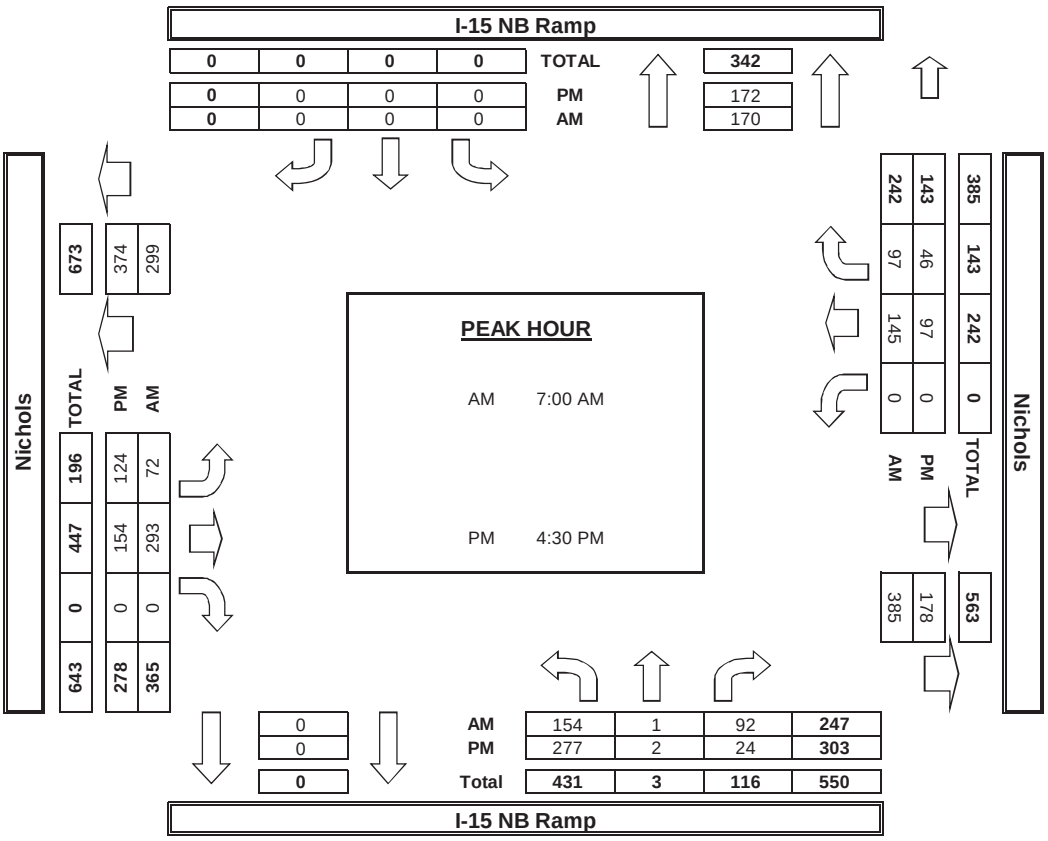


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: I-15 SB Ramp
EAST & WEST: Nichols

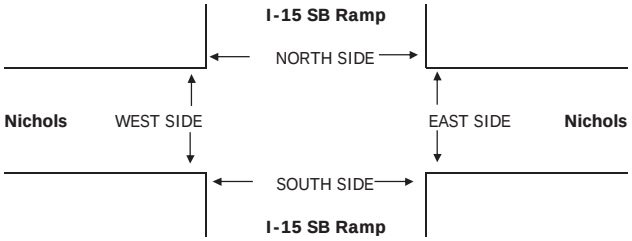
PROJECT #: SC1114
LOCATION #: 2
CONTROL: STOP ALL

NOTES:

AM PM MD OTHER OTHER — ▲ N ◄ W E ► S ▼

☐ Add U-Turns to Left Turns

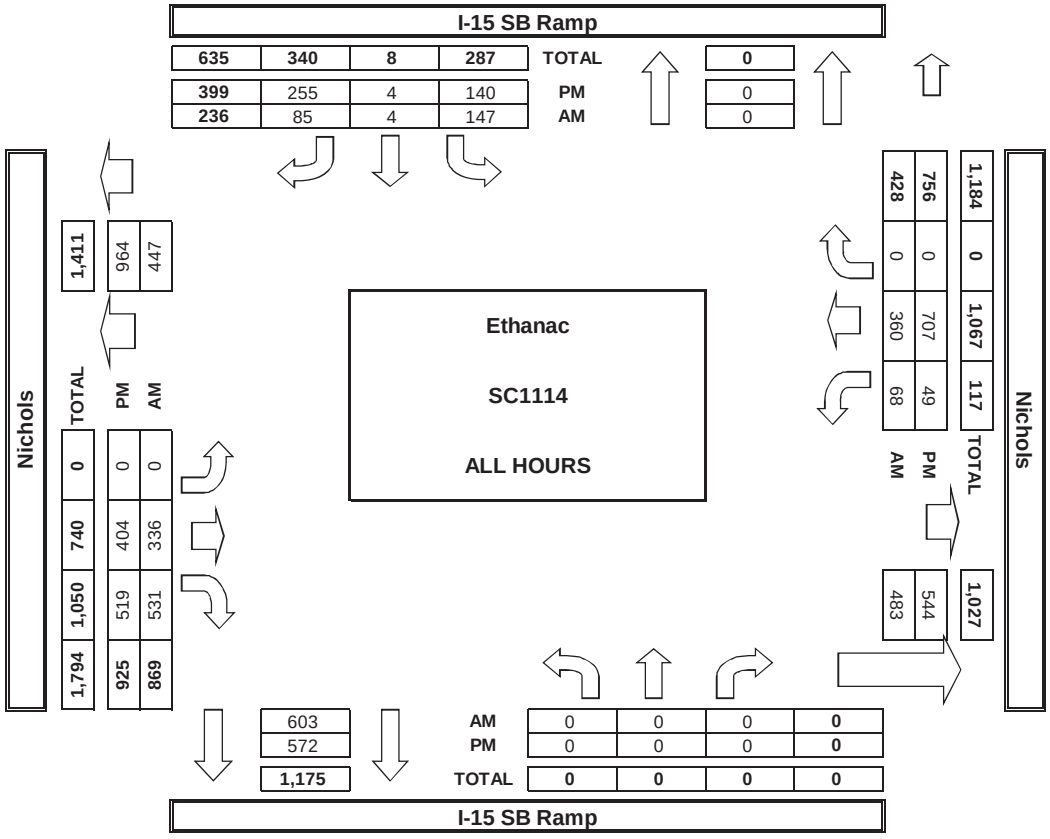
		NORTHBOUND I-15 SB Ramp			SOUTHBOUND I-15 SB Ramp			EASTBOUND Nichols			WESTBOUND Nichols				U-TURNS				
	LANES:	NL X	NT X	NR X	SL 0	ST 1	SR 0	EL X	ET 1	ER 1	WL 1	WT 1	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	67	1	16	0	103	51	12	62	0	312	0	0	0	0	0
	7:15 AM	0	0	0	42	1	13	0	66	74	15	98	0	309	0	0	0	0	0
	7:30 AM	0	0	0	12	1	10	0	37	95	8	68	0	231	0	0	0	0	0
	7:45 AM	0	0	0	8	1	20	0	31	71	10	26	0	167	0	0	0	0	0
	8:00 AM	0	0	0	12	0	19	0	22	82	6	29	0	170	0	0	0	0	0
	8:15 AM	0	0	0	6	0	7	0	22	64	6	32	0	137	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	32	53	3	20	0	108	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	23	41	8	25	0	97	0	0	2	0	2
	VOLUMES	0	0	0	147	4	85	0	336	531	68	360	0	1,533	0	0	2	0	2
	APPROACH %	0%	0%	0%	62%	2%	36%	0%	39%	61%	16%	84%	0%						
	APP/DEPART	0	/	0	236	/	603	869	/	483	428	/	447	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	0	0	0	129	4	59	0	237	291	45	254	0	1,019					
	APPROACH %	0%	0%	0%	67%	2%	31%	0%	45%	55%	15%	85%	0%						
	PEAK HR FACTOR		0.000			0.571			0.857			0.662		0.817					
	APP/DEPART	0	/	0	192	/	340	528	/	366	299	/	313	0					
PM	4:00 PM	0	0	0	18	2	32	0	61	67	6	82	0	268	0	0	0	0	0
	4:15 PM	0	0	0	17	0	39	0	58	70	8	67	0	259	0	0	1	0	1
	4:30 PM	0	0	0	20	0	39	0	53	70	7	80	0	269	0	0	0	0	0
	4:45 PM	0	0	0	18	1	35	0	54	59	4	96	0	267	0	0	1	0	1
	5:00 PM	0	0	0	21	0	26	0	51	71	7	83	0	259	0	0	0	0	0
	5:15 PM	0	0	0	8	0	35	0	56	75	3	94	0	271	0	0	0	0	0
	5:30 PM	0	0	0	13	0	24	0	36	47	8	97	0	225	0	0	0	0	0
	5:45 PM	0	0	0	25	1	25	0	35	60	6	108	0	260	0	0	0	0	0
	VOLUMES	0	0	0	140	4	255	0	404	519	49	707	0	2,080	0	0	2	0	2
	APPROACH %	0%	0%	0%	35%	1%	64%	0%	44%	56%	6%	94%	0%						
	APP/DEPART	0	/	0	399	/	572	925	/	544	756	/	964	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	0	0	0	67	1	135	0	214	275	21	353	0	1,067					
	APPROACH %	0%	0%	0%	33%	0%	67%	0%	44%	56%	6%	94%	0%						
	PEAK HR FACTOR		0.000			0.860			0.935			0.935		0.984					
	APP/DEPART	0	/	0	203	/	297	490	/	281	374	/	489	0					

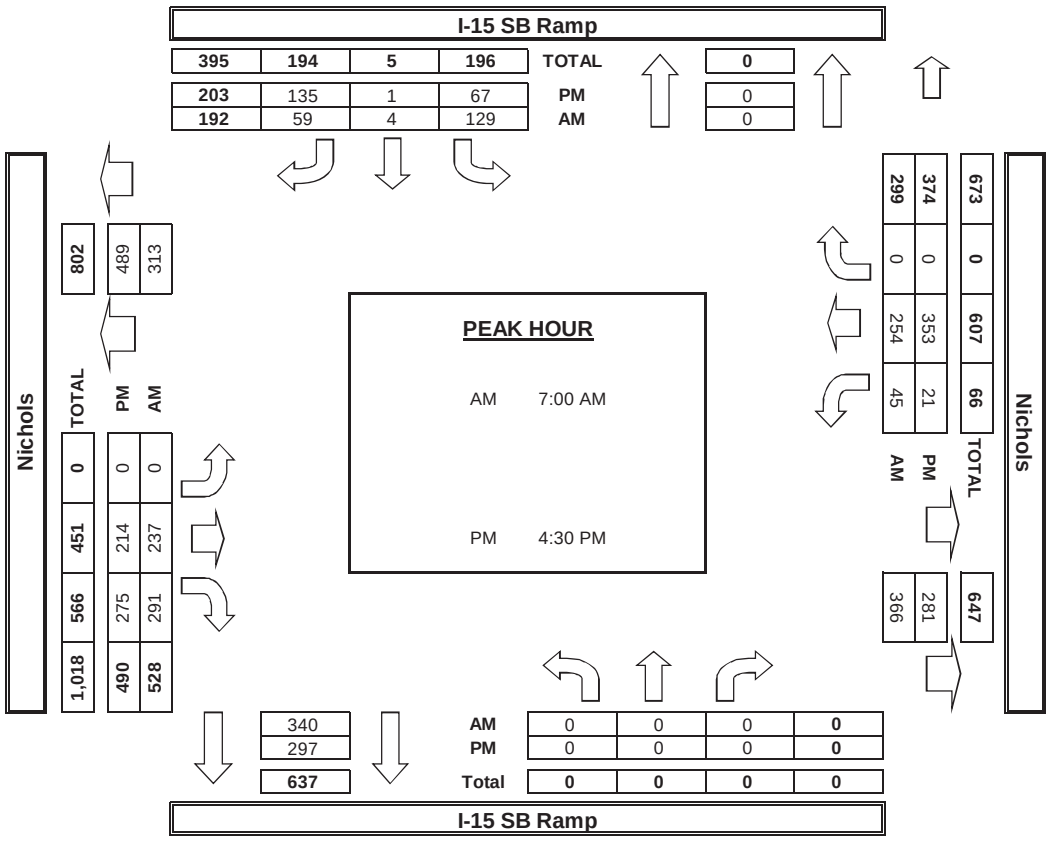


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	2	0	0	0	2	0	0	0	0	0	2	0	0	0	2
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

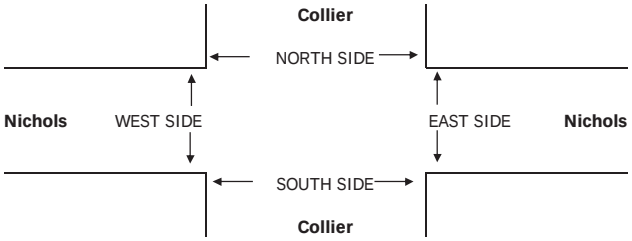
DATE:	LOCATION:	Ethanac	PROJECT #:	SC1114
Thu, Oct 27, 16	NORTH & SOUTH:	Collier	LOCATION #:	1
	EAST & WEST:	Nichols	CONTROL:	STOP N

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

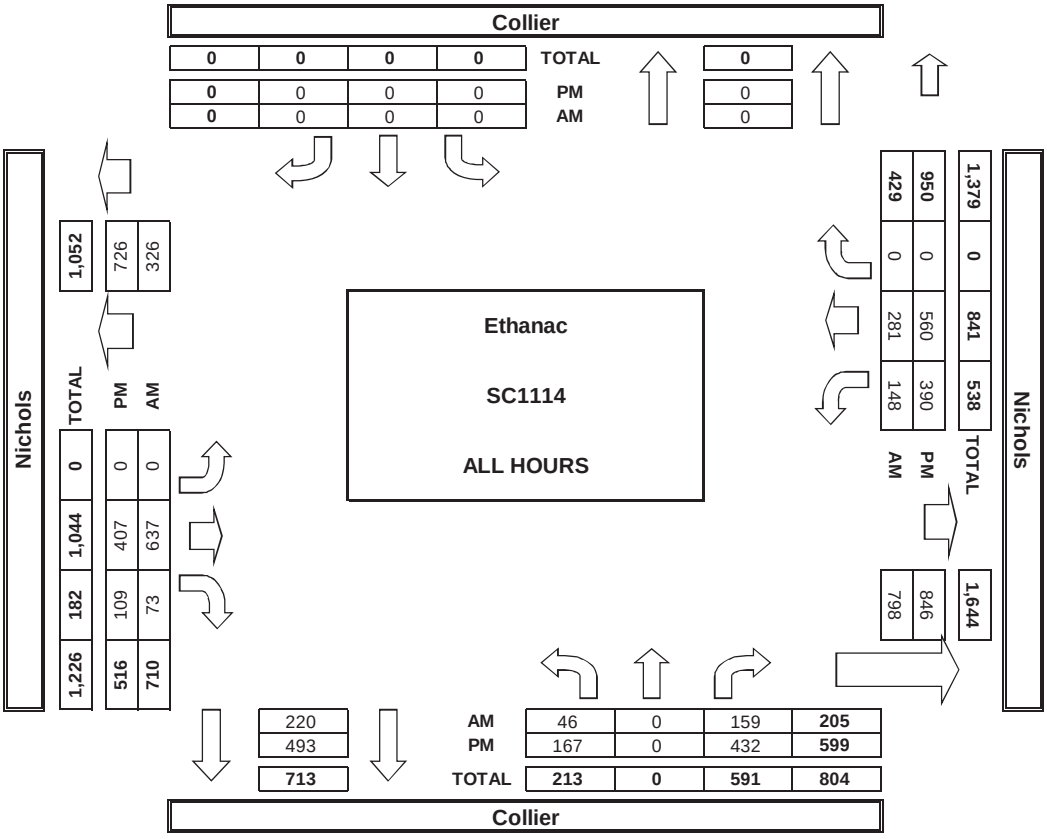
		NORTHBOUND (Collier)			SOUTHBOUND (Collier)			EASTBOUND (Nichols)			WESTBOUND (Nichols)				U-TURNS				
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 1	WT 1	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	5	0	28	0	0	0	0	126	3	31	50	0	243	0	0	0	0	0
	7:15 AM	9	0	28	0	0	0	0	88	7	23	80	0	235	0	0	0	1	1
	7:30 AM	4	0	16	0	0	0	0	111	15	24	51	0	221	0	0	0	0	0
	7:45 AM	4	0	20	0	0	0	0	74	7	22	22	0	149	0	0	0	0	0
	8:00 AM	6	0	18	0	0	0	0	74	9	24	23	0	154	0	0	0	1	1
	8:15 AM	7	0	9	0	0	0	0	68	17	11	23	0	135	1	0	0	0	1
	8:30 AM	8	0	22	0	0	0	0	54	8	5	15	0	112	0	0	0	0	0
	8:45 AM	3	0	18	0	0	0	0	42	7	8	17	0	95	0	0	0	0	0
	VOLUMES	46	0	159	0	0	0	0	637	73	148	281	0	1,344	1	0	0	2	3
	APPROACH %	22%	0%	78%	0%	0%	0%	0%	90%	10%	34%	66%	0%						
	APP/DEPART	205	/	0	0	/	220	710	/	798	429	/	326	0					
	BEGIN PEAK HR	7:00 AM																	
	VOLUMES	22	0	92	0	0	0	0	399	32	100	203	0	848					
	APPROACH %	19%	0%	81%	0%	0%	0%	0%	93%	7%	33%	67%	0%						
	PEAK HR FACTOR		0.770			0.000			0.835			0.735		0.872					
	APP/DEPART	114	/	0	0	/	131	431	/	492	303	/	225	0					
PM	4:00 PM	17	0	52	0	0	0	0	63	11	52	59	0	254	1	0	0	3	4
	4:15 PM	21	0	71	0	0	0	0	47	16	57	49	0	261	0	0	0	2	2
	4:30 PM	19	0	64	0	0	0	0	48	14	53	64	0	262	0	0	0	0	0
	4:45 PM	21	0	44	0	0	0	0	53	16	58	72	0	264	0	0	0	0	0
	5:00 PM	22	0	48	0	0	0	0	58	6	43	66	0	243	0	0	0	0	0
	5:15 PM	20	0	69	0	0	0	0	52	21	47	79	0	288	0	0	0	2	2
	5:30 PM	21	0	49	0	0	0	0	28	14	39	81	0	232	0	0	0	0	0
	5:45 PM	26	0	35	0	0	0	0	58	11	41	90	0	261	0	0	0	0	0
	VOLUMES	167	0	432	0	0	0	0	407	109	390	560	0	2,065	1	0	0	7	8
	APPROACH %	28%	0%	72%	0%	0%	0%	0%	79%	21%	41%	59%	0%						
	APP/DEPART	599	/	0	0	/	493	516	/	846	950	/	726	0					
	BEGIN PEAK HR	4:30 PM																	
	VOLUMES	82	0	225	0	0	0	0	211	57	201	281	0	1,057					
	APPROACH %	27%	0%	73%	0%	0%	0%	0%	79%	21%	42%	58%	0%						
	PEAK HR FACTOR		0.862			0.000			0.918			0.927		0.918					
	APP/DEPART	307	/	0	0	/	256	268	/	438	482	/	363	0					

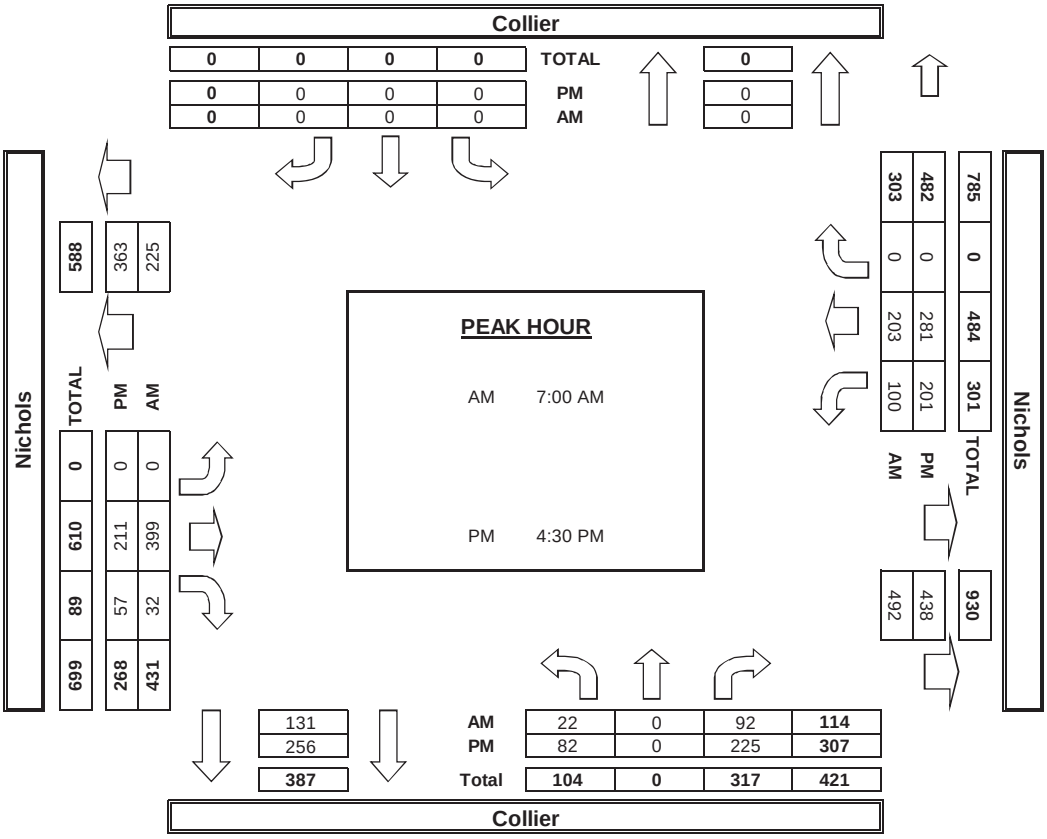


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: Collier
EAST & WEST: SR-74

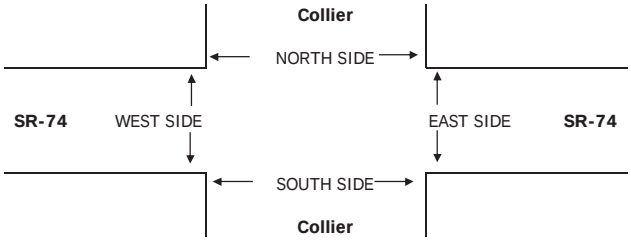
PROJECT #: SC1114
LOCATION #: 14
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

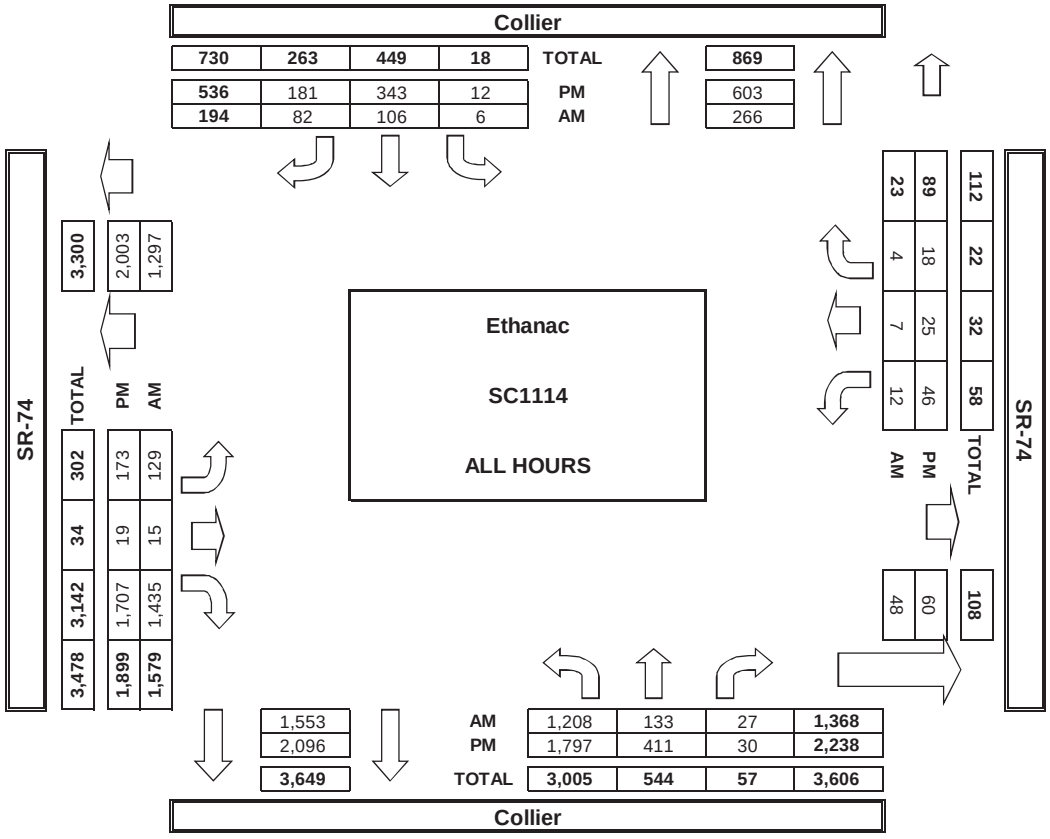
		NORTHBOUND Collier			SOUTHBOUND Collier			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL 1	NT 0.5	NR 0.5	SL 1	ST 1	SR 1	EL 0.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	147	12	0	0	15	13	29	0	170	0	0	0	386	0	0	0	0	0
	7:15 AM	165	14	0	1	10	13	18	0	180	0	0	0	401	0	0	0	0	0
	7:30 AM	144	11	2	1	18	17	18	1	219	0	0	0	431	0	0	0	0	0
	7:45 AM	162	14	5	0	11	11	12	1	200	1	0	0	417	0	0	0	0	0
	8:00 AM	152	21	4	0	14	11	13	4	197	2	1	0	419	0	0	0	0	0
	8:15 AM	159	14	5	2	22	5	15	3	154	1	1	2	383	0	0	0	0	0
	8:30 AM	145	22	7	1	7	7	11	6	163	5	3	1	378	0	0	0	0	0
	8:45 AM	134	25	4	1	9	5	13	0	152	3	2	1	349	0	0	0	0	0
	VOLUMES	1,208	133	27	6	106	82	129	15	1,435	12	7	4	3,164	0	0	0	0	0
	APPROACH %	88%	10%	2%	3%	55%	42%	8%	1%	91%	52%	30%	17%						
	APP/DEPART	1,368	/	266	194	/	1,553	1,579	/	48	23	/	1,297	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	623	60	11	2	53	52	61	6	796	3	1	0	1,668					
	APPROACH %	90%	9%	2%	2%	50%	49%	7%	1%	92%	75%	25%	0%						
	PEAK HR FACTOR		0.959			0.743			0.907			0.333		0.968					
	APP/DEPART	694	/	121	107	/	852	863	/	19	4	/	676	0					
PM	4:00 PM	228	48	3	8	40	16	24	6	207	9	5	2	596	0	0	0	0	0
	4:15 PM	236	59	10	1	36	14	33	2	207	11	1	5	615	0	0	0	0	0
	4:30 PM	201	58	5	1	54	30	24	9	230	5	5	3	625	0	0	0	0	0
	4:45 PM	196	47	2	1	42	21	17	1	203	7	4	3	544	0	1	0	0	1
	5:00 PM	229	55	3	0	52	30	20	1	199	7	3	4	603	0	0	0	0	0
	5:15 PM	245	48	4	1	41	26	19	0	222	4	4	1	615	0	0	0	0	0
	5:30 PM	228	47	2	0	33	23	16	0	239	3	2	0	593	0	0	0	0	0
	5:45 PM	234	49	1	0	45	21	20	0	200	0	1	0	571	0	0	0	0	0
	VOLUMES	1,797	411	30	12	343	181	173	19	1,707	46	25	18	4,762	0	1	0	0	1
	APPROACH %	80%	18%	1%	2%	64%	34%	9%	1%	90%	52%	28%	20%						
	APP/DEPART	2,238	/	603	536	/	2,096	1,899	/	60	89	/	2,003	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	871	208	14	3	189	107	80	11	854	23	16	11	2,387					
	APPROACH %	80%	19%	1%	1%	63%	36%	8%	1%	90%	46%	32%	22%						
	PEAK HR FACTOR		0.896			0.879			0.898			0.735		0.955					
	APP/DEPART	1,093	/	300	299	/	1,066	945	/	27	50	/	994	0					

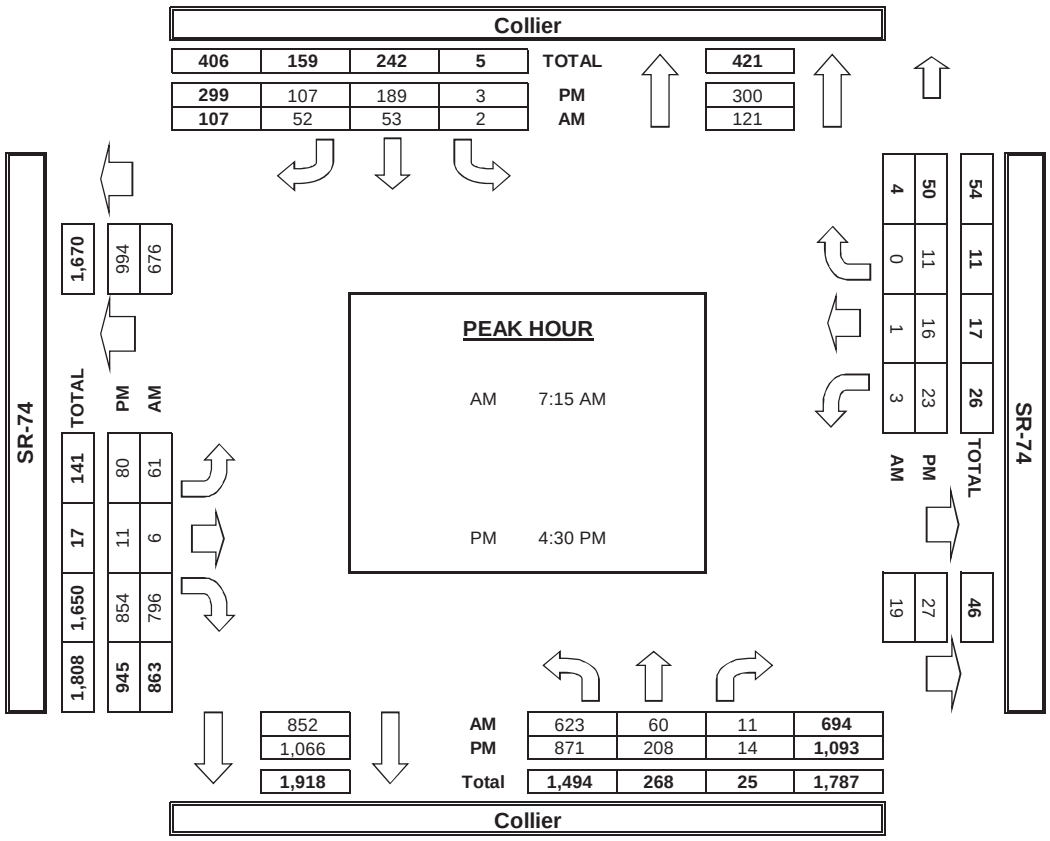


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	7:15 AM	1	0	6	0	7	1	0	6	0	7	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:00 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:15 AM	0	0	3	0	3	0	0	3	0	3	0	0	0	0	0
	8:30 AM	0	1	1	0	2	0	1	1	0	2	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	1	14	0	16	1	1	13	0	15	0	0	1	0	1
PM	4:00 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:30 PM	0	1	1	2	4	0	0	0	2	2	0	1	1	0	2
	5:45 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	TOTAL	0	1	5	2	8	0	0	3	2	5	0	1	2	0	3

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

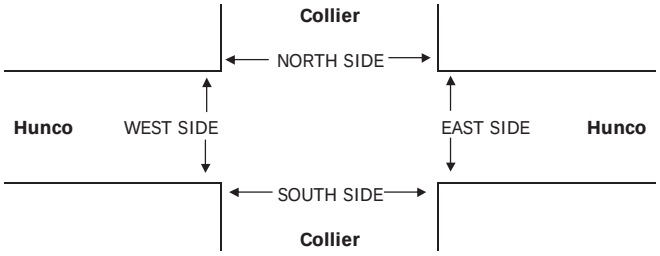
PREPARED BY: AimTD LLC. tel: 951 249 3226 pacific@aimtd.com

DATE:					
Thu, Nov 6, 14	LOCATION:	Lake Elsinore	PROJECT #:	SC0476
	NORTH & SOUTH:	Collier	LOCATION #:	4
	EAST & WEST:	Hunco	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

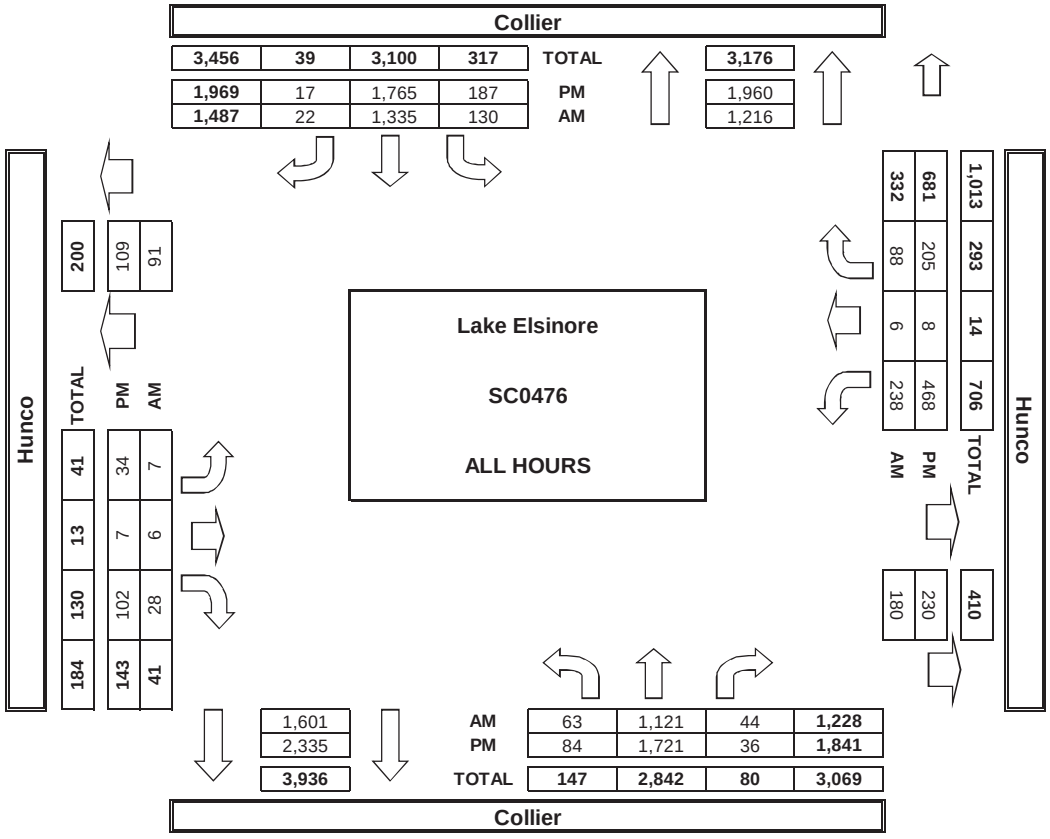
		NORTHBOUND (Collier)			SOUTHBOUND (Collier)			EASTBOUND (Hunco)			WESTBOUND (Hunco)				U-TURNS				
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
	LANES:	1	2	0	1	2	0	0	1	0	1	1	1		X	X	X	X	
AM	7:00 AM	4	173	8	3	150	2	0	0	2	22	0	8	372	0	0	0	0	0
	7:15 AM	3	163	8	10	190	1	0	0	1	25	0	8	409	0	0	0	0	0
	7:30 AM	11	133	4	14	187	2	0	0	3	12	1	10	377	1	0	0	0	1
	7:45 AM	14	143	3	12	190	5	0	0	4	25	0	12	408	0	0	0	0	0
	8:00 AM	9	123	4	16	164	5	1	1	6	34	1	11	375	0	0	0	0	0
	8:15 AM	11	137	6	19	150	3	1	4	2	34	3	14	384	0	0	0	0	0
	8:30 AM	7	130	10	32	148	2	1	0	4	33	0	14	381	0	0	0	0	0
	8:45 AM	4	119	1	24	156	2	4	1	6	53	1	11	382	0	0	0	0	0
	VOLUMES	63	1,121	44	130	1,335	22	7	6	28	238	6	88	3,089	1	0	0	0	1
	APPROACH %	5%	91%	4%	9%	90%	1%	17%	15%	68%	72%	2%	27%						
	APP/DEPART	1,229	/	1,216	1,487	/	1,602	41	/	180	332	/	91	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	37	562	19	52	731	13	1	1	14	96	2	41	1,569					
	APPROACH %	6%	91%	3%	7%	92%	2%	6%	6%	88%	69%	1%	29%						
	PEAK HR FACTOR		0.888			0.961			0.500			0.755		0.959					
	APP/DEPART	618	/	604	796	/	841	16	/	72	139	/	52	0					
PM	4:00 PM	12	219	2	27	210	2	2	1	14	67	6	24	586	0	0	0	0	0
	4:15 PM	4	212	7	32	237	4	2	0	8	66	0	25	597	0	0	0	0	0
	4:30 PM	13	245	5	23	230	2	4	1	13	76	0	21	633	0	0	0	0	0
	4:45 PM	7	191	5	20	208	2	7	0	7	58	2	29	536	2	0	0	0	2
	5:00 PM	17	209	6	23	243	3	5	3	18	47	0	30	604	1	0	0	0	1
	5:15 PM	18	238	2	15	206	0	4	0	19	56	0	25	583	1	0	0	0	1
	5:30 PM	7	207	4	19	224	3	6	1	9	50	0	28	558	0	0	0	0	0
	5:45 PM	6	200	5	28	207	1	4	1	14	48	0	23	537	1	0	0	0	1
	VOLUMES	84	1,721	36	187	1,765	17	34	7	102	468	8	205	4,639	5	0	0	0	5
	APPROACH %	5%	93%	2%	9%	90%	1%	24%	5%	71%	69%	1%	30%						
	APP/DEPART	1,846	/	1,960	1,969	/	2,340	143	/	230	681	/	109	0					
	BEGIN PEAK HR		4:15 PM																
	VOLUMES	41	857	23	98	918	11	18	4	46	247	2	105	2,370					
	APPROACH %	4%	93%	2%	10%	89%	1%	26%	6%	68%	70%	1%	30%						
	PEAK HR FACTOR		0.875			0.940			0.654			0.912		0.936					
	APP/DEPART	921	/	980	1,027	/	1,211	68	/	125	354	/	54	0					

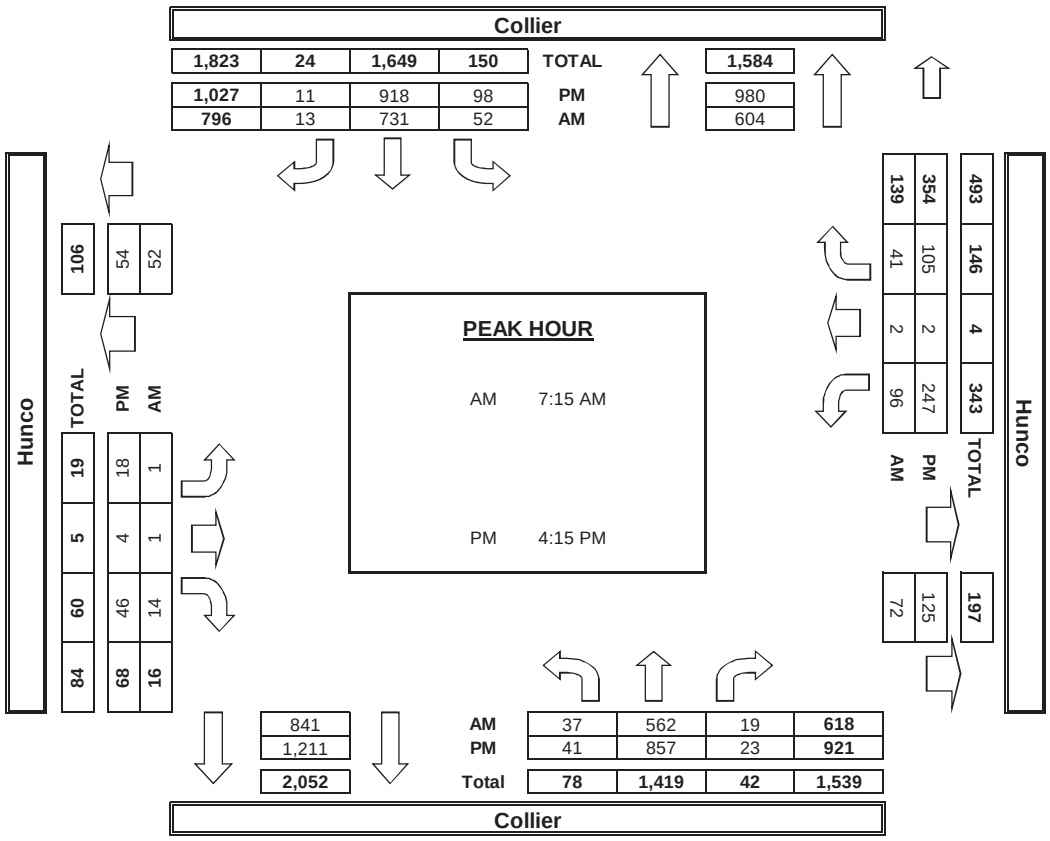


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Apr 18, 17

LOCATION: Lake Elsinore
NORTH & SOUTH: Collier
EAST & WEST: Central

PROJECT #: SC1294
LOCATION #: 1
CONTROL: SIGNAL

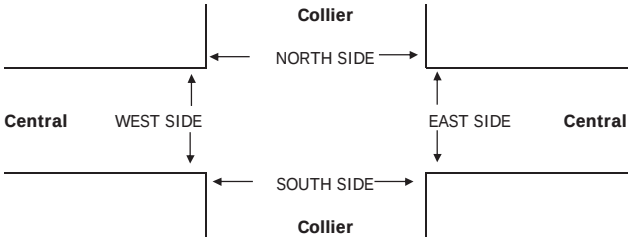
NOTES: PM EB queue

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

☑ Add U-Turns to Left Turns

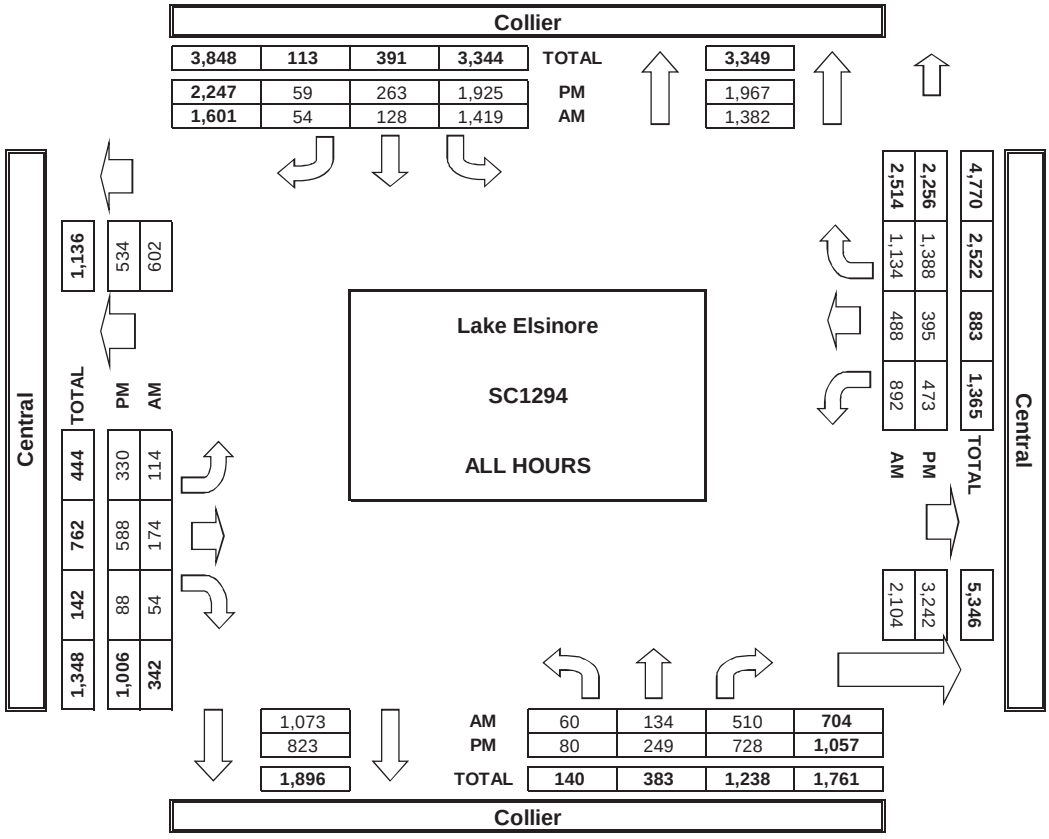
		NORTHBOUND (Collier)			SOUTHBOUND (Collier)			EASTBOUND (Central)			WESTBOUND (Central)				U-TURNS				
	LANES:	NL 1	NT 1	NR 1	SL 2	ST 2	SR 1	EL 2	ET 2	ER 0	WL 2	WT 1	WR 2	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	3	6	72	170	10	2	7	20	3	155	56	161	665	0	0	0	0	0
	7:15 AM	6	10	103	202	19	4	14	13	8	174	62	161	776	0	0	0	0	0
	7:30 AM	5	16	66	207	11	3	9	24	11	111	54	116	633	0	0	0	0	0
	7:45 AM	5	15	58	193	16	13	18	20	9	120	84	149	700	0	0	0	1	1
	8:00 AM	7	16	51	198	21	5	19	15	7	113	54	145	651	0	0	0	0	0
	8:15 AM	7	23	57	147	17	10	9	27	8	76	65	129	575	0	0	0	0	0
	8:30 AM	9	18	47	180	16	12	17	26	4	75	53	117	574	0	0	0	0	0
	8:45 AM	18	30	56	122	18	5	21	29	4	68	60	156	587	0	0	0	0	0
	VOLUMES	60	134	510	1,419	128	54	114	174	54	892	488	1,134	5,161	0	0	0	1	1
	APPROACH %	9%	19%	72%	89%	8%	3%	33%	51%	16%	35%	19%	45%						
	APP/DEPART	704	/	1,382	1,601	/	1,073	342	/	2,104	2,514	/	602	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	19	47	299	772	56	22	48	77	31	560	256	587	2,774					
	APPROACH %	5%	13%	82%	91%	7%	3%	31%	49%	20%	40%	18%	42%						
	PEAK HR FACTOR		0.767			0.944			0.830			0.884		0.894					
	APP/DEPART	365	/	682	850	/	646	156	/	1,149	1,403	/	297	0					
PM	4:00 PM	10	30	106	245	27	7	38	73	13	55	51	170	825	0	0	0	0	0
	4:15 PM	11	34	87	243	37	6	30	49	9	50	50	158	764	0	0	0	0	0
	4:30 PM	11	30	116	225	35	12	48	88	11	71	39	160	846	0	0	0	0	0
	4:45 PM	9	35	87	266	43	11	49	85	13	74	41	199	912	0	0	0	0	0
	5:00 PM	10	30	103	252	35	5	60	100	3	63	51	154	866	0	0	0	0	0
	5:15 PM	10	31	58	242	28	5	34	80	10	49	50	179	776	0	0	0	1	1
	5:30 PM	14	33	109	235	25	7	35	58	12	53	61	189	831	0	0	0	0	0
	5:45 PM	5	26	62	217	33	6	36	55	17	58	52	179	746	0	0	0	0	0
	VOLUMES	80	249	728	1,925	263	59	330	588	88	473	395	1,388	6,566	0	0	0	1	1
	APPROACH %	8%	24%	69%	86%	12%	3%	33%	58%	9%	21%	18%	62%						
	APP/DEPART	1,057	/	1,967	2,247	/	823	1,006	/	3,242	2,256	/	534	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	40	126	364	985	141	33	191	353	37	257	181	692	3,400					
	APPROACH %	8%	24%	69%	85%	12%	3%	33%	61%	6%	23%	16%	61%						
	PEAK HR FACTOR		0.844			0.905			0.891			0.900		0.932					
	APP/DEPART	530	/	1,009	1,159	/	434	581	/	1,703	1,130	/	254	0					

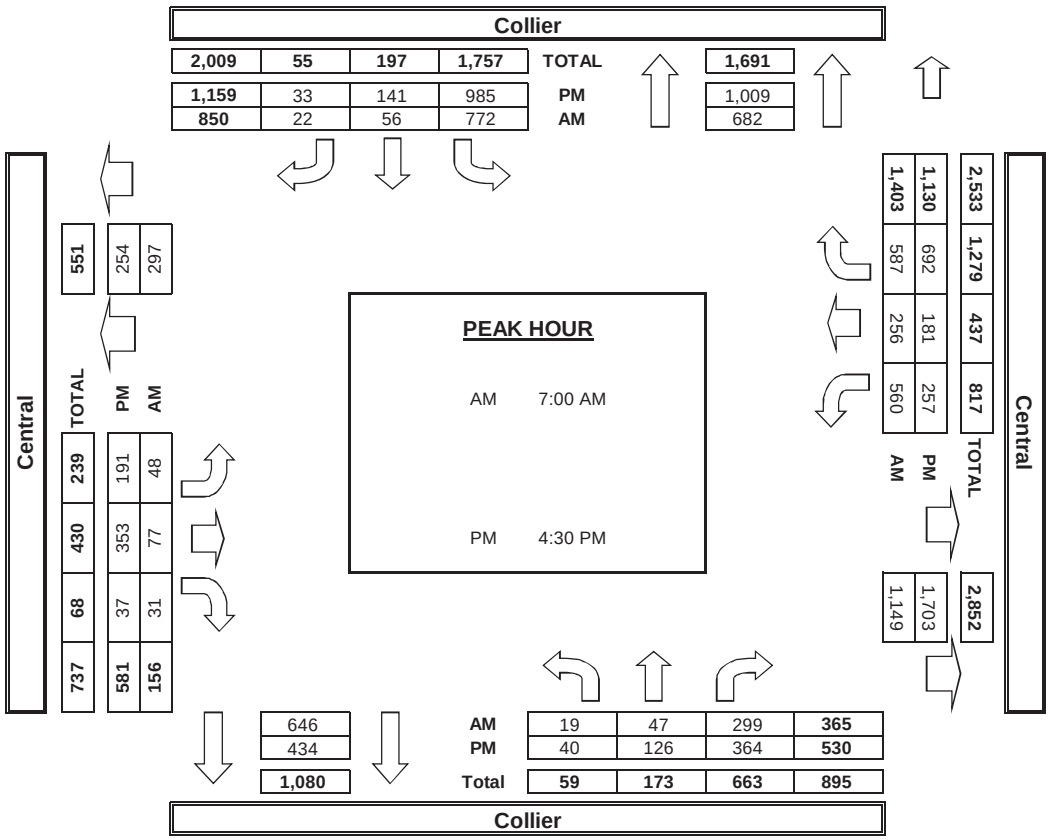


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	1	0	0	1	2	1	0	0	1	2	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	7:45 AM	1	1	0	0	2	1	0	0	0	1	0	1	0	0	1
	8:00 AM	1	0	0	2	3	0	0	0	1	1	1	0	0	1	2
	8:15 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	2	0	0	2	4	1	0	0	2	3	1	0	0	0	1
	TOTAL	6	1	0	6	13	4	0	0	5	9	2	1	0	1	4
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	2	0	0	2	4	2	0	0	2	4	0	0	0	0	0
	4:30 PM	2	0	0	0	2	1	0	0	0	1	1	0	0	0	1
	4:45 PM	1	0	0	2	3	1	0	0	2	3	0	0	0	0	0
	5:00 PM	1	0	0	2	3	0	0	0	1	1	1	0	0	1	2
	5:15 PM	2	0	0	5	7	1	0	0	4	5	1	0	0	1	2
	5:30 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	5:45 PM	3	0	0	5	8	1	0	0	3	4	2	0	0	2	4
	TOTAL	12	0	0	16	28	7	0	0	12	19	5	0	0	4	9

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

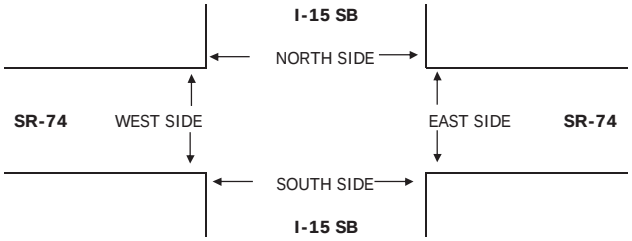
DATE:	LOCATION:	Ethanac	PROJECT #:	SC1114
Thu, Oct 27, 16	NORTH & SOUTH:	I-15 SB	LOCATION #:	15
	EAST & WEST:	SR-74	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

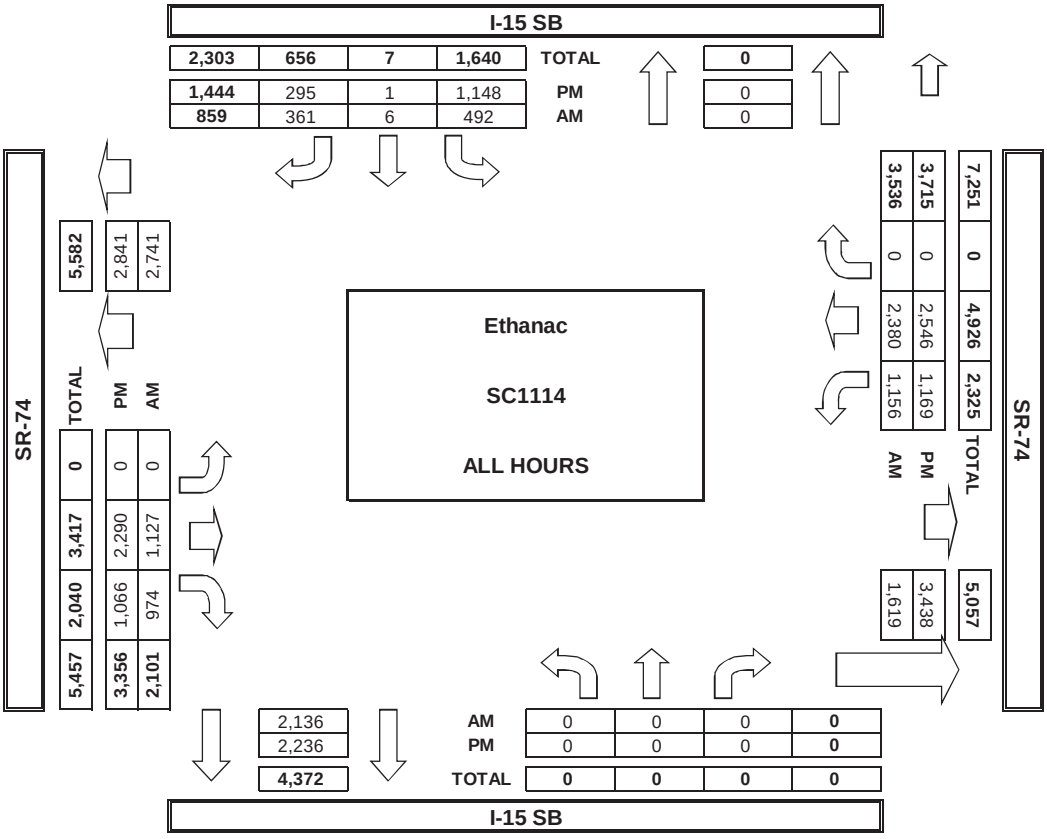
		NORTHBOUND I-15 SB			SOUTHBOUND I-15 SB			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL X	NT X	NR X	SL 1.3	ST 0.3	SR 1.3	EL X	ET 2	ER 1	WL 2	WT 2	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	59	0	35	0	165	96	138	327	0	820	0	0	0	0	0
	7:15 AM	0	0	0	60	0	42	0	165	108	178	367	0	920	0	0	0	0	0
	7:30 AM	0	0	0	58	1	36	0	151	170	189	301	0	906	0	0	0	0	0
	7:45 AM	0	0	0	58	2	56	0	136	111	159	361	0	883	0	0	0	0	0
	8:00 AM	0	0	0	59	2	42	0	147	156	135	281	0	822	0	0	0	0	0
	8:15 AM	0	0	0	59	0	46	0	131	111	104	246	0	697	0	0	0	0	0
	8:30 AM	0	0	0	64	1	56	0	118	111	116	245	0	711	0	0	0	0	0
	8:45 AM	0	0	0	75	0	48	0	114	111	137	252	0	737	0	0	0	0	0
	VOLUMES	0	0	0	492	6	361	0	1,127	974	1,156	2,380	0	6,496	0	0	0	0	0
	APPROACH %	0%	0%	0%	57%	1%	42%	0%	54%	46%	33%	67%	0%						
	APP/DEPART	0	/	0	859	/	2,136	2,101	/	1,619	3,536	/	2,741	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	0	0	0	235	5	176	0	599	545	661	1,310	0	3,531					
	APPROACH %	0%	0%	0%	56%	1%	42%	0%	52%	48%	34%	66%	0%						
	PEAK HR FACTOR		0.000			0.897			0.891			0.904		0.960					
	APP/DEPART	0	/	0	416	/	1,211	1,144	/	834	1,971	/	1,486	0					
PM	4:00 PM	0	0	0	170	0	37	0	282	145	133	321	0	1,088	0	0	0	0	0
	4:15 PM	0	0	0	132	0	41	0	282	124	174	330	0	1,083	0	0	0	0	0
	4:30 PM	0	0	0	117	0	34	0	282	155	160	284	0	1,032	0	0	0	0	0
	4:45 PM	0	0	0	143	0	30	0	299	136	120	350	0	1,078	0	0	0	0	0
	5:00 PM	0	0	0	169	0	47	0	268	148	142	303	0	1,077	0	0	0	0	0
	5:15 PM	0	0	0	122	1	34	0	300	128	158	302	0	1,045	0	0	0	0	0
	5:30 PM	0	0	0	154	0	35	0	283	115	145	324	0	1,056	0	0	0	0	0
	5:45 PM	0	0	0	141	0	37	0	294	115	137	332	0	1,056	0	0	0	0	0
	VOLUMES	0	0	0	1,148	1	295	0	2,290	1,066	1,169	2,546	0	8,515	0	0	0	0	0
	APPROACH %	0%	0%	0%	80%	0%	20%	0%	68%	32%	31%	69%	0%						
	APP/DEPART	0	/	0	1,444	/	2,236	3,356	/	3,438	3,715	/	2,841	0					
	BEGIN PEAK HR		4:00 PM																
	VOLUMES	0	0	0	562	0	142	0	1,145	560	587	1,285	0	4,281					
	APPROACH %	0%	0%	0%	80%	0%	20%	0%	67%	33%	31%	69%	0%						
	PEAK HR FACTOR		0.000			0.850			0.975			0.929		0.984					
	APP/DEPART	0	/	0	704	/	1,147	1,705	/	1,707	1,872	/	1,427	0					

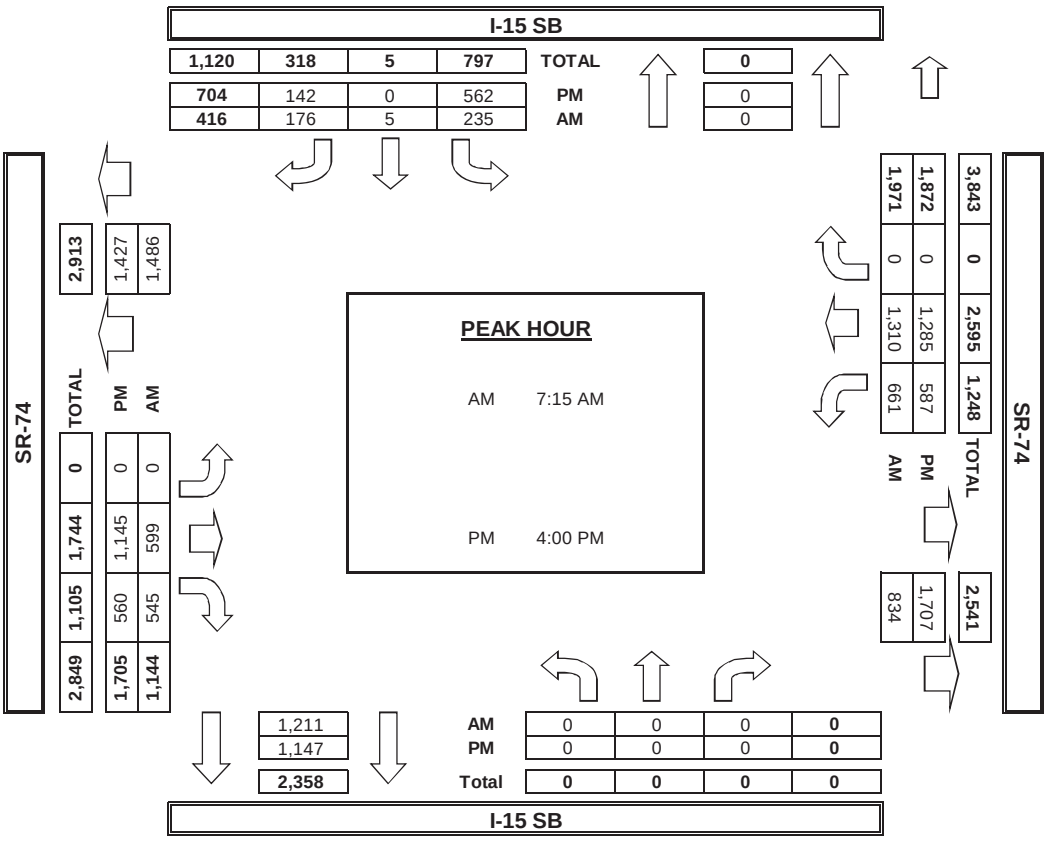


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	7:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:30 AM	2	3	0	0	5	2	3	0	0	5	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
	8:30 AM	3	0	0	0	3	2	0	0	0	2	1	0	0	0	1
	8:45 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	TOTAL	10	4	0	0	14	8	4	0	0	12	2	0	0	0	2
PM	4:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	4	0	0	0	4	3	0	0	0	3	1	0	0	0	1
	5:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	5	0	0	0	5	5	0	0	0	5	0	0	0	0	0
	TOTAL	12	0	0	0	12	8	0	0	0	8	4	0	0	0	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: I-15 NB
EAST & WEST: SR-74

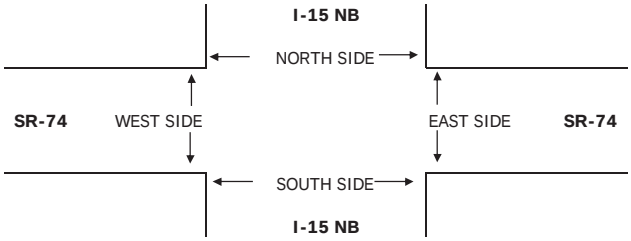
PROJECT #: SC1114
LOCATION #: 16
CONTROL: SIGNAL

NOTES:
PM EB/WB queue

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

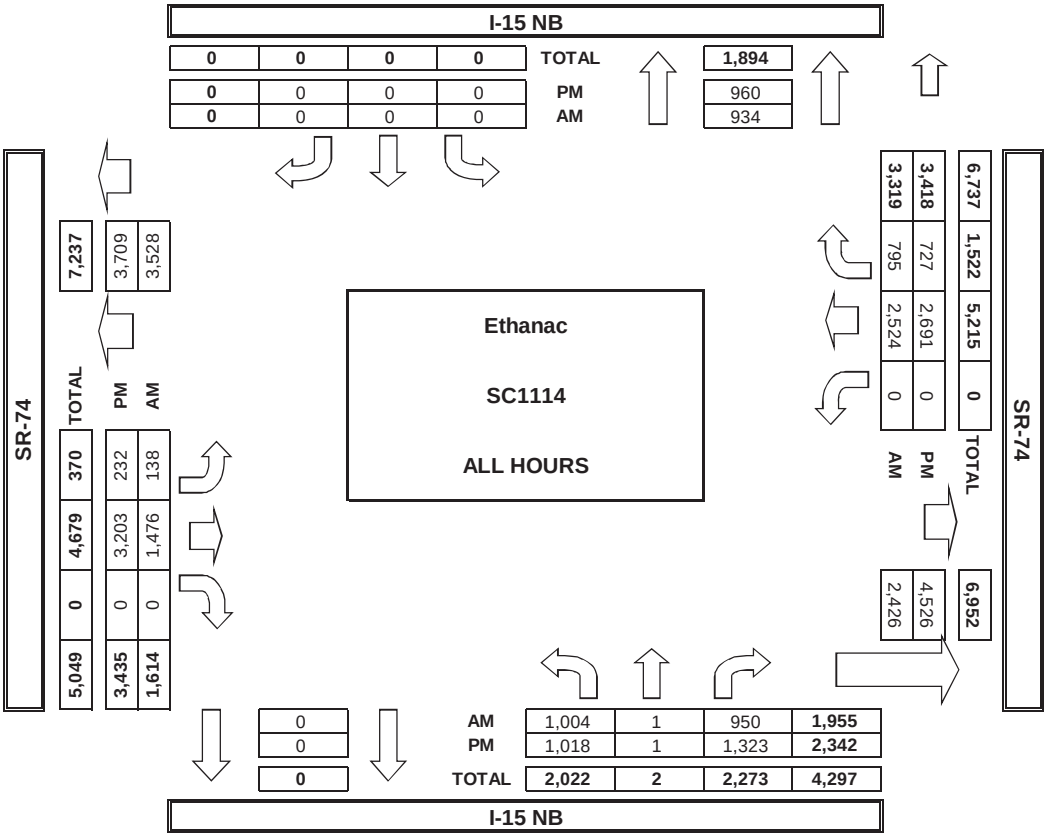
		NORTHBOUND I-15 NB			SOUTHBOUND I-15 NB			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL 1.3	NT 0.3	NR 1.3	SL X	ST X	SR X	EL 1	ET 3	ER X	WL X	WT 3	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	118	0	155	0	0	0	12	210	0	0	345	118	958	0	0	0	0	0
	7:15 AM	114	0	142	0	0	0	14	212	0	0	428	125	1,035	0	0	0	0	0
	7:30 AM	129	0	136	0	0	0	15	194	0	0	358	109	941	0	0	0	0	0
	7:45 AM	154	0	120	0	0	0	19	173	0	0	367	92	925	0	0	0	0	0
	8:00 AM	119	0	100	0	0	0	22	184	0	0	296	109	830	0	0	0	0	0
	8:15 AM	112	1	104	0	0	0	23	168	0	0	239	80	727	0	0	0	0	0
	8:30 AM	129	0	97	0	0	0	15	166	0	0	232	79	718	0	0	0	0	0
	8:45 AM	129	0	96	0	0	0	18	169	0	0	259	83	754	0	0	0	0	0
	VOLUMES	1,004	1	950	0	0	0	138	1,476	0	0	2,524	795	6,888	0	0	0	0	0
	APPROACH %	51%	0%	49%	0%	0%	0%	9%	91%	0%	0%	76%	24%						
	APP/DEPART	1,955	/	934	0	/	0	1,614	/	2,426	3,319	/	3,528	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	515	0	553	0	0	0	60	789	0	0	1,498	444	3,859					
	APPROACH %	48%	0%	52%	0%	0%	0%	7%	93%	0%	0%	77%	23%						
	PEAK HR FACTOR		0.974			0.000			0.939			0.878		0.932					
	APP/DEPART	1,068	/	504	0	/	0	849	/	1,342	1,942	/	2,013	0					
PM	4:00 PM	131	1	167	0	0	0	34	419	0	0	323	94	1,169	0	0	0	0	0
	4:15 PM	130	0	168	0	0	0	31	381	0	0	375	74	1,159	0	0	0	0	0
	4:30 PM	125	0	143	0	0	0	31	369	0	0	317	88	1,073	0	0	0	0	0
	4:45 PM	110	0	168	0	0	0	28	414	0	0	358	83	1,161	0	0	0	0	0
	5:00 PM	140	0	166	0	0	0	30	408	0	0	304	90	1,138	0	0	0	0	0
	5:15 PM	128	0	182	0	0	0	29	392	0	0	331	109	1,171	0	0	0	0	0
	5:30 PM	132	0	192	0	0	0	30	405	0	0	337	96	1,192	0	0	0	0	0
	5:45 PM	122	0	137	0	0	0	19	415	0	0	346	93	1,132	0	0	0	0	0
	VOLUMES	1,018	1	1,323	0	0	0	232	3,203	0	0	2,691	727	9,195	0	0	0	0	0
	APPROACH %	43%	0%	56%	0%	0%	0%	7%	93%	0%	0%	79%	21%						
	APP/DEPART	2,342	/	960	0	/	0	3,435	/	4,526	3,418	/	3,709	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	510	0	708	0	0	0	117	1,619	0	0	1,330	378	4,662					
	APPROACH %	42%	0%	58%	0%	0%	0%	7%	93%	0%	0%	78%	22%						
	PEAK HR FACTOR		0.940			0.000			0.982			0.968		0.978					
	APP/DEPART	1,218	/	495	0	/	0	1,736	/	2,327	1,708	/	1,840	0					

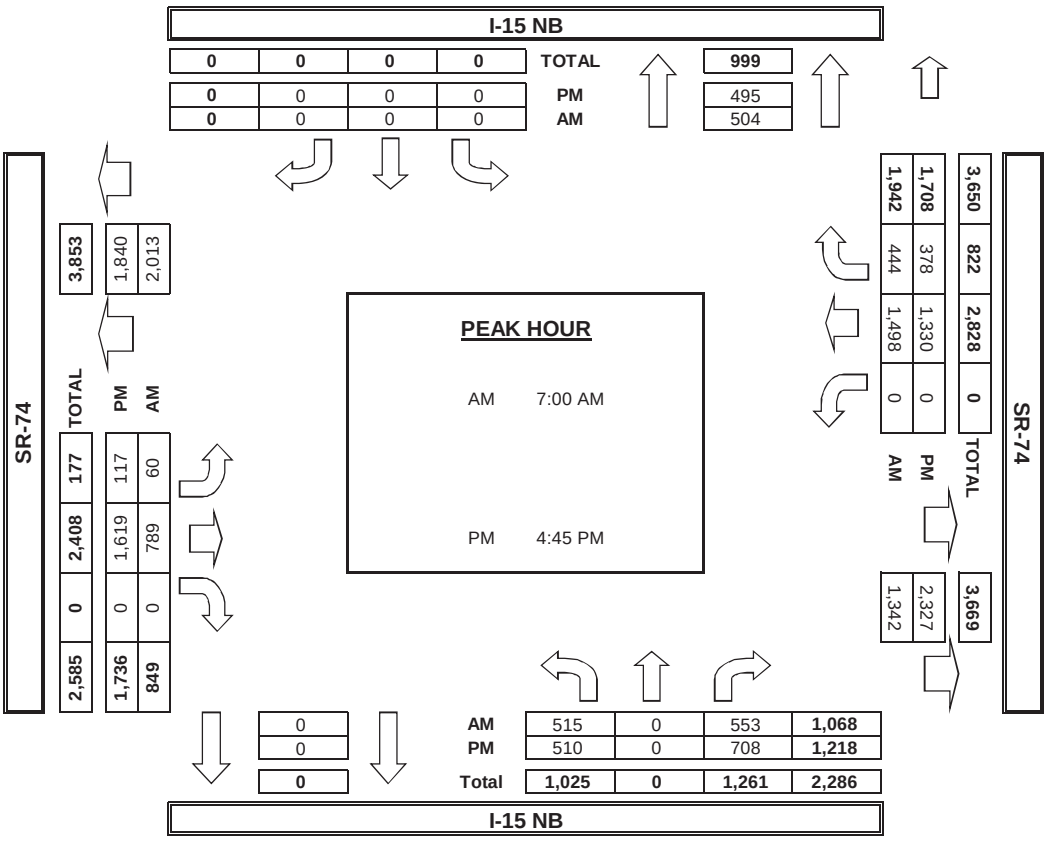


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	3	0	0	0	3	3	0	0	0	3	0	0	0	0	0
	7:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:30 AM	4	3	0	0	7	4	3	0	0	7	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
	8:30 AM	3	0	0	0	3	2	0	0	0	2	1	0	0	0	1
	8:45 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	TOTAL	14	4	0	0	18	12	4	0	0	16	2	0	0	0	2
PM	4:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	4	0	0	0	4	3	0	0	0	3	1	0	0	0	1
	5:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	5	0	0	0	5	5	0	0	0	5	0	0	0	0	0
	TOTAL	12	0	0	0	12	8	0	0	0	8	4	0	0	0	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: Dexter
EAST & WEST: SR-74

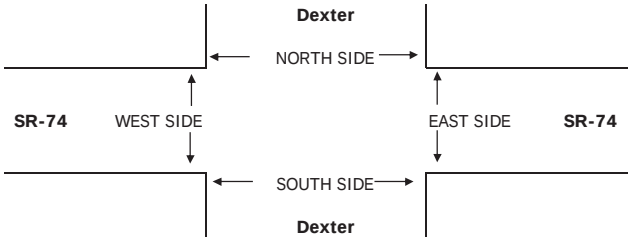
PROJECT #: SC1114
LOCATION #: 17
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

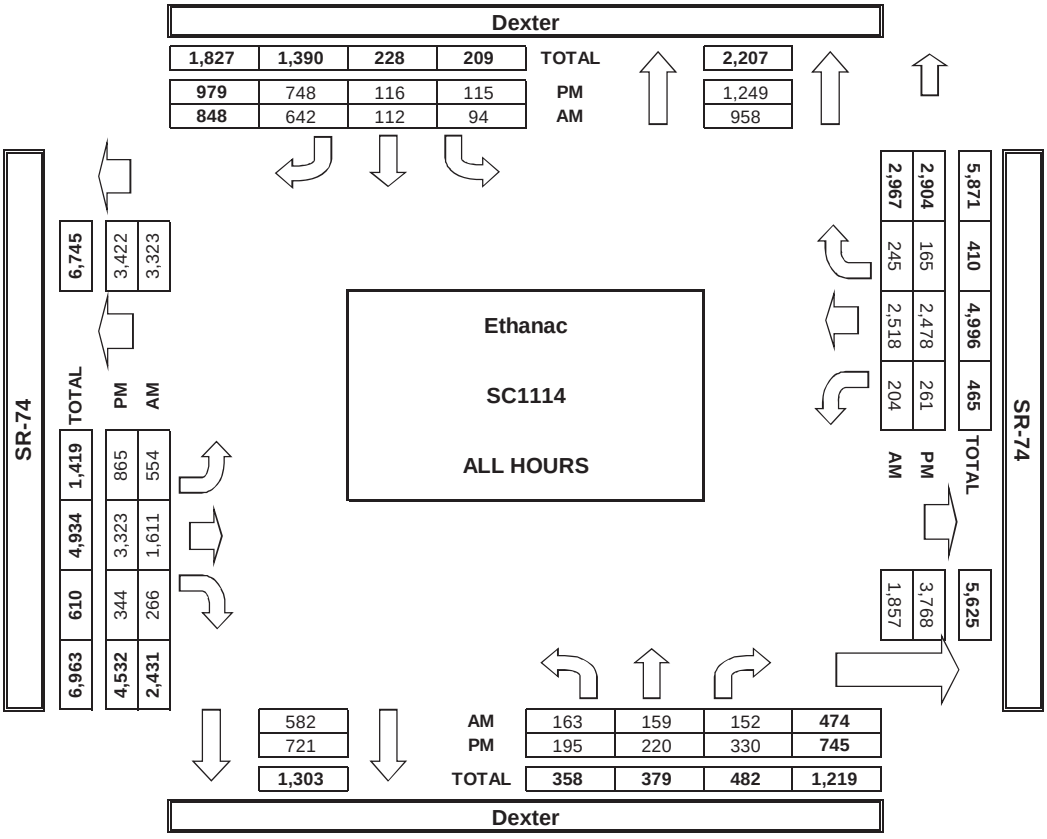
		NORTHBOUND Dexter			SOUTHBOUND Dexter			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 1	EL 1	ET 3	ER 1	WL 1	WT 4	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	25	62	20	11	20	115	107	230	30	23	326	64	1,033	0	0	0	0	0
	7:15 AM	20	30	20	22	32	160	96	238	19	25	372	54	1,088	0	0	0	0	0
	7:30 AM	20	20	29	22	31	112	59	249	24	36	335	27	964	0	0	0	0	0
	7:45 AM	17	18	23	15	6	58	55	206	31	35	384	23	871	0	0	0	0	0
	8:00 AM	18	5	19	7	5	47	59	173	53	26	340	29	781	0	0	0	0	0
	8:15 AM	19	8	8	7	5	55	62	176	34	16	244	17	651	0	0	0	0	0
	8:30 AM	21	6	16	7	7	57	54	175	34	14	235	15	641	0	0	0	0	0
	8:45 AM	23	10	17	3	6	38	62	164	41	29	282	16	691	0	0	0	0	0
	VOLUMES	163	159	152	94	112	642	554	1,611	266	204	2,518	245	6,720	0	0	0	0	0
	APPROACH %	34%	34%	32%	11%	13%	76%	23%	66%	11%	7%	85%	8%						
	APP/DEPART	474	/	958	848	/	582	2,431	/	1,857	2,967	/	3,323	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	82	130	92	70	89	445	317	923	104	119	1,417	168	3,956					
	APPROACH %	27%	43%	30%	12%	15%	74%	24%	69%	8%	7%	83%	10%						
	PEAK HR FACTOR		0.710			0.706			0.916			0.945		0.909					
	APP/DEPART	304	/	615	604	/	312	1,344	/	1,085	1,704	/	1,944	0					
PM	4:00 PM	20	29	43	17	14	84	105	438	46	35	313	32	1,176	0	0	0	0	0
	4:15 PM	28	28	37	11	12	109	121	390	38	34	314	19	1,141	0	0	0	0	0
	4:30 PM	30	25	43	21	13	106	105	374	36	30	271	22	1,076	0	0	0	0	0
	4:45 PM	25	24	41	13	18	81	114	428	39	45	336	18	1,182	0	0	1	0	1
	5:00 PM	21	23	47	17	17	91	97	430	46	25	281	18	1,113	0	0	0	0	0
	5:15 PM	26	33	35	18	20	93	110	433	33	35	321	20	1,177	0	0	0	0	0
	5:30 PM	21	26	43	10	12	83	109	438	50	27	328	18	1,165	0	0	0	0	0
	5:45 PM	24	32	41	8	10	101	104	392	56	30	314	18	1,130	0	0	0	0	0
	VOLUMES	195	220	330	115	116	748	865	3,323	344	261	2,478	165	9,160	0	0	1	0	1
	APPROACH %	26%	30%	44%	12%	12%	76%	19%	73%	8%	9%	85%	6%						
	APP/DEPART	745	/	1,249	979	/	721	4,532	/	3,768	2,904	/	3,422	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	93	106	166	58	67	348	430	1,729	168	132	1,266	74	4,637					
	APPROACH %	25%	29%	45%	12%	14%	74%	18%	74%	7%	9%	86%	5%						
	PEAK HR FACTOR		0.971			0.903			0.974			0.922		0.981					
	APP/DEPART	365	/	609	473	/	367	2,327	/	1,953	1,472	/	1,708	0					

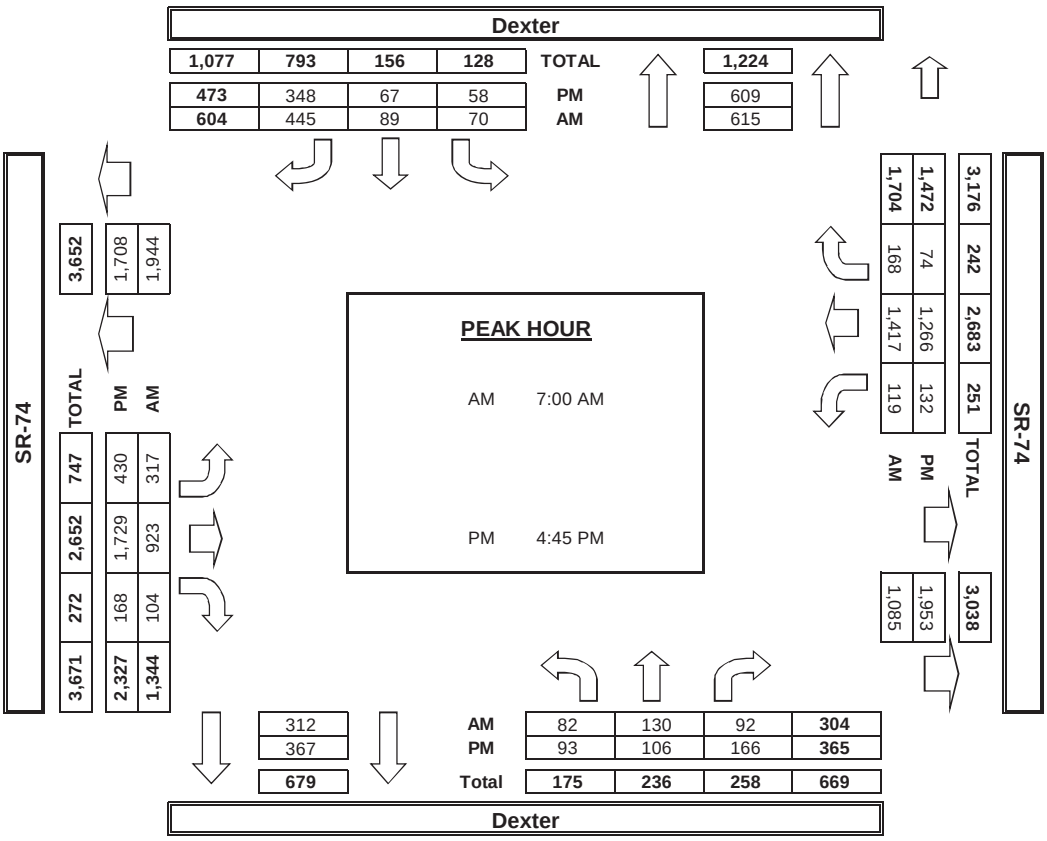


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	7:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	7:30 AM	3	3	2	0	8	3	3	2	0	8	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
	8:30 AM	2	0	3	0	5	1	0	2	0	3	1	0	1	0	2
	8:45 AM	2	0	1	0	3	2	0	1	0	3	0	0	0	0	0
	TOTAL	9	3	8	0	20	8	3	7	0	18	1	0	1	0	2
PM	4:00 PM	7	2	4	0	13	4	2	4	0	10	3	0	0	0	3
	4:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	2	1	2	0	5	1	1	1	0	3	1	0	1	0	2
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:30 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:45 PM	4	0	4	0	8	4	0	2	0	6	0	0	2	0	2
	TOTAL	14	3	12	0	29	9	3	9	0	21	5	0	3	0	8

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Lake Elsinore	PROJECT #:	SC1384
Wed, Jun 21, 17	NORTH & SOUTH:	Gunnerson	LOCATION #:	1
	EAST & WEST:	Riverside	CONTROL:	STOP N/S

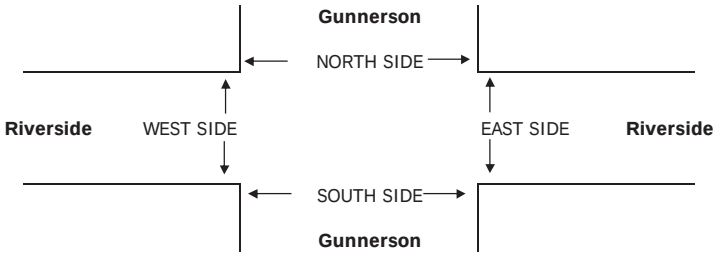
NOTES:

AM EB queue

AM PM MD OTHER OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND Gunnerson			SOUTHBOUND Gunnerson			EASTBOUND Riverside			WESTBOUND Riverside				U-TURNS				
	LANES:	NL 0	NT 1	NR 1	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	1	4	0	0	1	130	1	0	117	9	263	0	0	0	0	0
	7:15 AM	0	0	0	11	2	0	0	183	0	1	107	4	308	0	0	0	0	0
	7:30 AM	0	0	1	23	1	0	1	191	0	1	103	1	322	0	0	0	0	0
	7:45 AM	0	0	3	9	0	1	0	204	0	2	120	7	346	0	0	0	0	0
	8:00 AM	0	0	1	11	0	0	0	225	4	3	118	11	373	0	0	0	0	0
	8:15 AM	1	0	4	9	0	1	1	224	5	0	133	5	383	0	0	0	0	0
	8:30 AM	0	1	2	4	3	2	3	203	15	2	108	5	348	0	0	0	0	0
	8:45 AM	0	1	1	12	1	1	2	207	0	1	129	3	358	0	0	0	0	0
	VOLUMES	1	2	13	83	7	5	8	1,567	25	10	935	45	2,701	0	0	0	0	0
	APPROACH %	6%	13%	81%	87%	7%	5%	1%	98%	2%	1%	94%	5%						
	APP/DEPART	16	/	55	95	/	42	1,600	/	1,663	990	/	941	0					
	BEGIN PEAK HR		8:00 AM																
	VOLUMES	1	2	8	36	4	4	6	859	24	6	488	24	1,462					
	APPROACH %	9%	18%	73%	82%	9%	9%	1%	97%	3%	1%	94%	5%						
	PEAK HR FACTOR		0.550			0.786			0.966			0.938		0.954					
	APP/DEPART	11	/	32	44	/	34	889	/	903	518	/	493	0					
PM	4:00 PM	0	0	4	6	1	3	1	237	1	3	199	25	480	0	0	0	0	0
	4:15 PM	0	0	3	8	1	1	1	227	1	1	170	17	430	0	0	0	0	0
	4:30 PM	0	0	1	11	0	1	1	256	0	2	226	25	523	0	0	0	0	0
	4:45 PM	0	1	2	8	0	1	0	222	1	2	204	22	463	0	0	0	0	0
	5:00 PM	0	1	3	6	1	2	0	201	0	0	200	28	442	0	0	0	0	0
	5:15 PM	0	0	3	2	0	1	0	216	0	2	220	25	469	0	0	0	0	0
	5:30 PM	0	0	1	6	0	1	0	220	1	1	228	16	474	0	0	0	0	0
	5:45 PM	0	0	0	8	0	1	1	218	1	1	221	28	479	0	0	0	0	0
	VOLUMES	0	2	17	55	3	11	4	1,797	5	12	1,668	186	3,760	0	0	0	0	0
	APPROACH %	0%	11%	89%	80%	4%	16%	0%	100%	0%	1%	89%	10%						
	APP/DEPART	19	/	192	69	/	20	1,806	/	1,869	1,866	/	1,679	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	0	2	9	27	1	5	1	895	1	6	850	100	1,897					
	APPROACH %	0%	18%	82%	82%	3%	15%	0%	100%	0%	1%	89%	10%						
	PEAK HR FACTOR		0.688			0.688			0.873			0.945		0.907					
	APP/DEPART	11	/	103	33	/	8	897	/	931	956	/	855	0					



INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

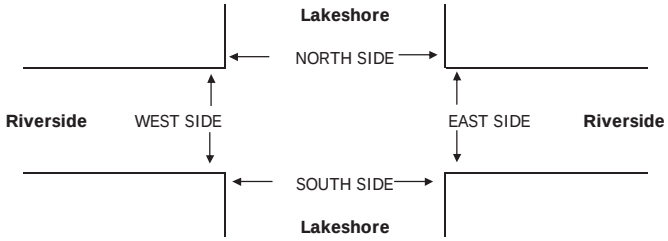
DATE:	LOCATION:	Lake Elsinore	PROJECT #:	SC
Tue, May 23, 17	NORTH & SOUTH:	Lakeshore	LOCATION #:	8
	EAST & WEST:	Riverside	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

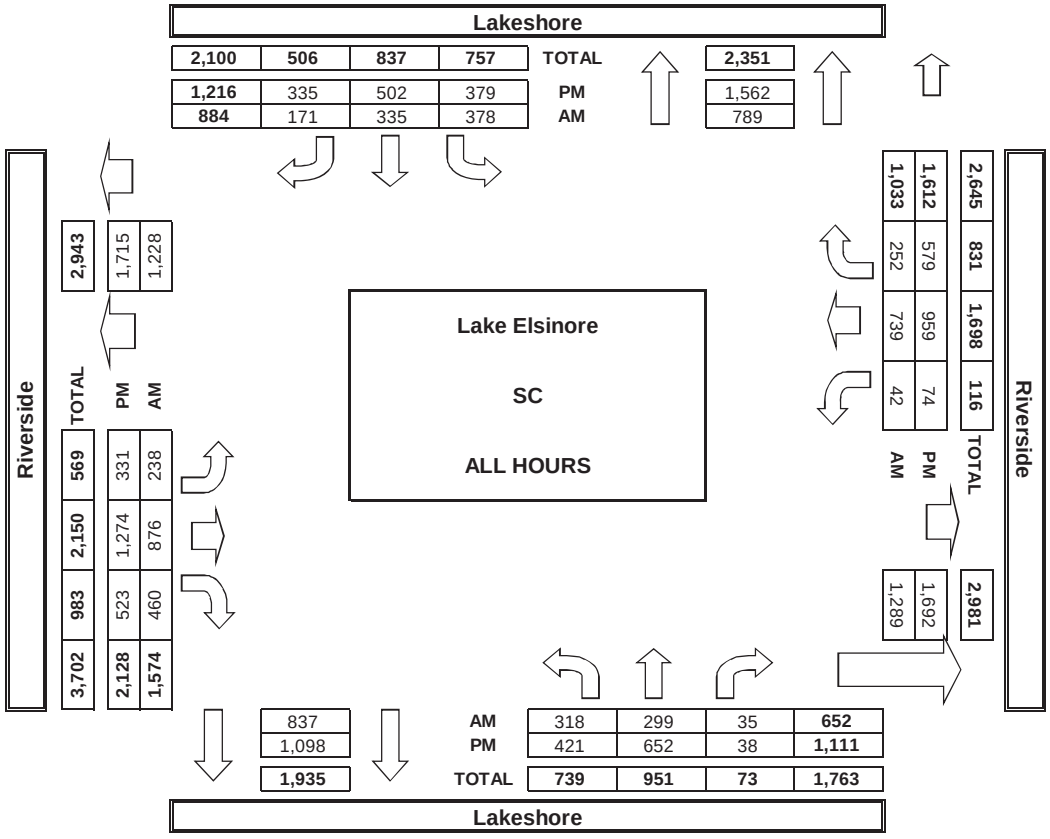
		NORTHBOUND (Lakeshore)			SOUTHBOUND (Lakeshore)			EASTBOUND (Riverside)			WESTBOUND (Riverside)				U-TURNS				
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 2	ER 1	WL 1	WT 1	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	46	36	4	45	48	22	25	126	63	3	101	31	550	0	0	0	0	0
	7:15 AM	39	32	4	53	34	17	39	145	72	7	100	22	564	0	0	0	0	0
	7:30 AM	35	46	4	60	43	27	37	112	51	5	87	36	543	0	0	0	0	0
	7:45 AM	38	36	3	38	53	27	25	99	40	6	107	41	513	0	0	0	0	0
	8:00 AM	43	38	7	54	40	18	23	96	59	7	84	26	495	0	0	0	0	0
	8:15 AM	39	36	4	43	41	18	24	85	54	6	96	38	484	0	0	0	0	0
	8:30 AM	34	28	5	42	35	14	32	101	61	2	80	27	461	0	0	0	0	0
	8:45 AM	44	47	4	43	41	28	33	112	60	6	84	31	533	0	0	0	0	0
	VOLUMES	318	299	35	378	335	171	238	876	460	42	739	252	4,143	0	0	0	0	0
	APPROACH %	49%	46%	5%	43%	38%	19%	15%	56%	29%	4%	72%	24%						
	APP/DEPART	652	/	789	884	/	837	1,574	/	1,289	1,033	/	1,228	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	158	150	15	196	178	93	126	482	226	21	395	130	2,170					
	APPROACH %	49%	46%	5%	42%	38%	20%	15%	58%	27%	4%	72%	24%						
	PEAK HR FACTOR		0.939			0.898			0.814			0.886		0.962					
	APP/DEPART	323	/	406	467	/	425	834	/	693	546	/	646	0					
PM	4:00 PM	55	93	5	49	66	41	43	165	81	12	143	76	829	0	0	0	0	0
	4:15 PM	52	82	6	50	62	29	36	201	68	10	126	80	802	0	0	0	0	0
	4:30 PM	52	75	7	46	78	45	37	144	65	16	140	81	786	0	0	0	0	0
	4:45 PM	51	76	0	43	55	52	43	154	70	10	122	68	744	0	0	0	1	1
	5:00 PM	57	108	5	50	65	36	43	172	59	3	105	72	775	0	0	0	0	0
	5:15 PM	55	81	5	44	56	48	52	148	64	12	113	67	745	0	0	0	0	0
	5:30 PM	43	65	4	49	68	44	39	178	60	10	103	75	738	0	0	0	0	0
	5:45 PM	56	72	6	48	52	40	38	112	56	1	107	60	648	0	0	0	0	0
	VOLUMES	421	652	38	379	502	335	331	1,274	523	74	959	579	6,067	0	0	0	1	1
	APPROACH %	38%	59%	3%	31%	41%	28%	16%	60%	25%	5%	59%	36%						
	APP/DEPART	1,111	/	1,562	1,216	/	1,098	2,128	/	1,692	1,612	/	1,715	0					
	BEGIN PEAK HR		4:00 PM																
	VOLUMES	210	326	18	188	261	167	159	664	284	48	531	305	3,161					
	APPROACH %	38%	59%	3%	31%	42%	27%	14%	60%	26%	5%	60%	35%						
	PEAK HR FACTOR		0.905			0.911			0.907			0.932		0.953					
	APP/DEPART	554	/	790	616	/	592	1,107	/	871	884	/	908	0					

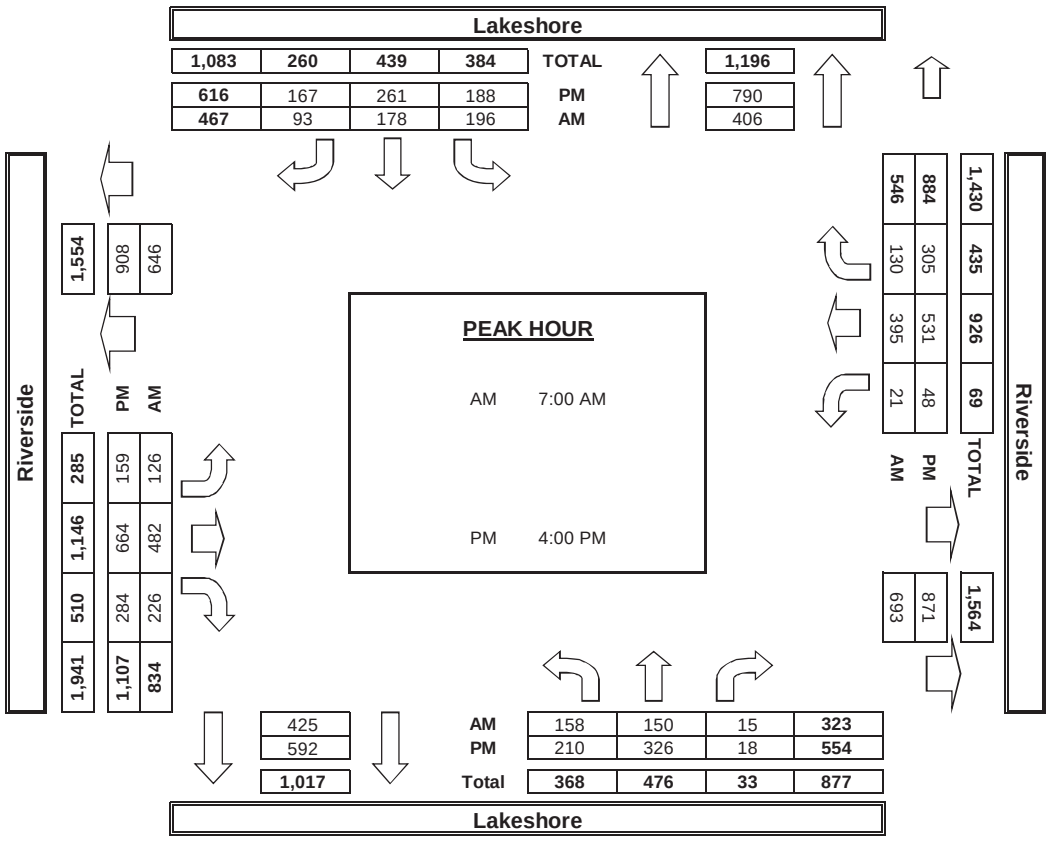


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





Tuesday, June 20, 2017 Location: Lake Elsinore PROJECT: SC1384

ADT Collier between Riverside and Central. **Prepared by AimTD tel. 714 253 7888**

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
0:00	36		19					12:00	229		180				
0:15	24		19					12:15	226		208				
0:30	24		18					12:30	221		163				
0:45	26	110	23	79			189	12:45	187	863	209	760			1623
1:00	26		11					13:00	239		209				
1:15	14		11					13:15	216		238				
1:30	9		7					13:30	224		222				
1:45	16	65	11	40			105	13:45	240	919	214	883			1802
2:00	12		10					14:00	206		199				
2:15	14		6					14:15	230		210				
2:30	14		5					14:30	202		209				
2:45	19	59	19	40			99	14:45	180	818	173	791			1609
3:00	15		17					15:00	212		221				
3:15	11		19					15:15	219		201				
3:30	24		26					15:30	200		190				
3:45	31	81	26	88			169	15:45	252	883	213	825			1708
4:00	29		42					16:00	216		221				
4:15	46		47					16:15	236		225				
4:30	88		61					16:30	288		269				
4:45	146	309	73	223			532	16:45	230	970	244	959			1929
5:00	170		88					17:00	289		215				
5:15	173		85					17:15	260		226				
5:30	165		116					17:30	274		194				
5:45	140	648	150	439			1087	17:45	240	1063	217	852			1915
6:00	124		119					18:00	235		221				
6:15	126		115					18:15	235		216				
6:30	138		149					18:30	201		201				
6:45	132	520	155	538			1058	18:45	223	894	208	846			1740
7:00	136		129					19:00	229		211				
7:15	121		192					19:15	190		191				
7:30	129		214					19:30	187		193				
7:45	149	535	265	800			1335	19:45	183	789	172	767			1556
8:00	163		247					20:00	192		167				
8:15	133		262					20:15	160		178				
8:30	141		262					20:30	181		135				
8:45	160	597	281	1052			1649	20:45	167	700	102	582			1282
9:00	145		235					21:00	150		114				
9:15	164		255					21:15	129		83				
9:30	173		270					21:30	144		81				
9:45	172	654	243	1003			1657	21:45	82	505	55	333			838
10:00	163		192					22:00	101		53				
10:15	179		178					22:15	88		41				
10:30	170		190					22:30	62		46				
10:45	202	714	209	769			1483	22:45	63	314	40	180			494
11:00	221		204					23:00	47		31				
11:15	208		226					23:15	50		28				
11:30	201		176					23:30	55		31				
11:45	214	844	189	795			1639	23:45	38	190	15	105			295
Total Vol.		5136		5866			**11002**			8908		7883			**16791**

Daily Totals

NB	SB	EB	WB	Combined
14044	13749			**27793**

	AM			PM		
Split %	46.7%	53.3%	**39.6%**	53.1%	46.9%	**60.4%**
Peak Hour	11:45	8:00	**8:45**	16:30	16:00	**16:30**
Volume	890	1052	**1683**	1067	959	**2021**
P.H.F.	0.97	0.94	**0.95**	0.95	0.89	**0.91**

cs@aimtd.com Tell. 714 253 7888

Wednesday, August 09, 2017 Location: Lake Elsinore PROJECT: SC

ADT1 Riverside west of Collier. **Prepared by AimTD tel. 714 253 7888**

AM Period	EB		WB			PM Period	EB		WB		
0:00	17		40			12:00	209		201		
0:15	19		27			12:15	173		180		
0:30	18		33			12:30	208		185		
0:45	18	72	15	115	187	12:45	170	760	209	775	1535
1:00	10		29			13:00	175		183		
1:15	21		23			13:15	161		168		
1:30	9		9			13:30	202		194		
1:45	15	55	22	83	138	13:45	175	713	186	731	1444
2:00	12		12			14:00	177		212		
2:15	14		11			14:15	188		185		
2:30	7		14			14:30	198		233		
2:45	7	40	13	50	90	14:45	201	764	189	819	1583
3:00	13		11			15:00	217		226		
3:15	19		11			15:15	242		224		
3:30	37		13			15:30	298		206		
3:45	36	105	27	62	167	15:45	261	1018	219	875	1893
4:00	39		46			16:00	377		226		
4:15	59		52			16:15	294		220		
4:30	75		90			16:30	220		251		
4:45	94	267	140	328	595	16:45	223	1114	247	944	2058
5:00	103		123			17:00	242		226		
5:15	98		165			17:15	203		280		
5:30	133		170			17:30	244		257		
5:45	117	451	158	616	1067	17:45	239	928	223	986	1914
6:00	109		136			18:00	280		197		
6:15	110		132			18:15	220		211		
6:30	158		152			18:30	202		213		
6:45	177	554	118	538	1092	18:45	260	962	213	834	1796
7:00	168		131			19:00	193		201		
7:15	172		133			19:15	162		203		
7:30	188		113			19:30	188		188		
7:45	200	728	117	494	1222	19:45	159	702	198	790	1492
8:00	163		115			20:00	161		196		
8:15	144		97			20:15	150		148		
8:30	205		118			20:30	136		195		
8:45	146	658	137	467	1125	20:45	101	548	165	704	1252
9:00	165		121			21:00	104		137		
9:15	146		139			21:15	82		131		
9:30	163		160			21:30	68		124		
9:45	178	652	150	570	1222	21:45	58	312	106	498	810
10:00	141		174			22:00	49		77		
10:15	174		147			22:15	42		105		
10:30	198		157			22:30	41		82		
10:45	170	683	162	640	1323	22:45	29	161	77	341	502
11:00	194		167			23:00	46		78		
11:15	164		176			23:15	27		43		
11:30	211		192			23:30	29		48		
11:45	214	783	185	720	1503	23:45	35	137	43	212	349
Total Vol.	5048		4683		**9731**		8119		8509		**16628**

Daily Totals

EB	WB	Combined
13167	13192	**26359**

	AM			PM		
Split %	51.9%	48.1%	**36.9%**	48.8%	51.2%	**63.1%**
Peak Hour	11:30	11:30	**11:30**	15:30	16:45	**15:30**
Volume	807	758	**1565**	1230	1010	**2101**
P.H.F.	0.94	0.94	**0.95**	0.87	0.90	**0.87**

cs@aimtd.com Tell. 714 253 7888

Wednesday, May 10, 2017 | CITY: Lake Elsinore | PROJECT: SC1330

ADT1 Collier south of Nichols. | Prepared by: Field Data Services of Arizona | **Prepared by AimTD LLC tel. 714 253 7888**

AM Period	NB		SB		EB		WB			PM Period	NB		SB		EB		WB		
0:30	4		11		0		0			12:00	40		44		0		0		
0:15	2		4		0		0			12:15	48		50		0		0		
0:30	2		3		0		0			12:30	54		69		0		0		
0:45	1	9	0	18	0	0	0	0	27	12:45	65	207	44	207	0	0	0	0	414
1:00	0		5		0		0			13:00	47		54		0		0		
1:15	1		1		0		0			13:15	51		51		0		0		
1:30	4		3		0		0			13:30	58		54		0		0		
1:45	0	5	1	10	0	0	0	0	15	13:45	63	219	66	225	0	0	0	0	444
2:00	2		4		0		0			14:00	54		59		0		0		
2:15	1		2		0		0			14:15	49		68		0		0		
2:30	1		2		0		0			14:30	36		71		0		0		
2:45	2	6	1	9	0	0	0	0	15	14:45	78	217	71	269	0	0	0	0	486
3:00	5		5		0		0			15:00	76		64		0		0		
3:15	3		3		0		0			15:15	61		68		0		0		
3:30	7		15		0		0			15:30	70		60		0		0		
3:45	9	24	21	44	0	0	0	0	68	15:45	72	279	72	264	0	0	0	0	543
4:00	14		12		0		0			16:00	72		76		0		0		
4:15	14		24		0		0			16:15	82		82		0		0		
4:30	20		17		0		0			16:30	80		83		0		0		
4:45	14	62	35	88	0	0	0	0	150	16:45	86	320	80	321	0	0	0	0	641
5:00	32		20		0		0			17:00	88		58		0		0		
5:15	21		23		0		0			17:15	93		69		0		0		
5:30	30		40		0		0			17:30	63		70		0		0		
5:45	27	110	24	107	0	0	0	0	217	17:45	73	317	78	275	0	0	0	0	592
6:00	16		30		0		0			18:00	62		50		0		0		
6:15	28		24		0		0			18:15	62		62		0		0		
6:30	25		30		0		0			18:30	66		41		0		0		
6:45	35	104	34	118	0	0	0	0	222	18:45	43	233	40	193	0	0	0	0	426
7:00	33		30		0		0			19:00	33		33		0		0		
7:15	39		42		0		0			19:15	48		28		0		0		
7:30	28		36		0		0			19:30	37		33		0		0		
7:45	34	134	48	156	0	0	0	0	290	19:45	44	162	28	122	0	0	0	0	284
8:00	28		37		0		0			20:00	48		23		0		0		
8:15	38		31		0		0			20:15	32		17		0		0		
8:30	25		38		0		0			20:30	27		16		0		0		
8:45	26	117	34	140	0	0	0	0	257	20:45	26	133	32	88	0	0	0	0	221
9:00	28		38		0		0			21:00	23		18		0		0		
9:15	35		27		0		0			21:15	20		14		0		0		
9:30	30		35		0		0			21:30	20		17		0		0		
9:45	19	112	47	147	0	0	0	0	259	21:45	14	77	13	62	0	0	0	0	139
10:00	29		44		0		0			22:00	10		9		0		0		
10:15	30		46		0		0			22:15	6		8		0		0		
10:30	37		52		0		0			22:30	2		17		0		0		
10:45	37	133	48	190	0	0	0	0	323	22:45	4	22	10	44	0	0	0	0	66
11:00	44		45		0		0			23:00	8		8		0		0		
11:15	54		53		0		0			23:15	6		6		0		0		
11:30	29		51		0		0			23:30	7		6		0		0		
11:45	54	181	64	213	0	0	0	0	394	23:45	2	23	4	24	0	0	0	0	47
Total Vol.		997		1240					**2237**			2209		2094					**4303**

Daily Totals

NB	SB	EB	WB	**Combined**
3206	3334			**6540**

	AM					**PM**		
Split %	44.6%	55.4%			**34.2%**	51.3%	48.7%	**65.8%**
Peak Hour	11:45	11:45	0:30	0:30	**11:45**	16:30	16:00	**16:00**
Volume	196	227			**423**	347	321	**641**
P.H.F.	0.91	0.82			**0.86**	0.97	0.97	**0.97**

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Appendix C: LOS and Queuing Worksheets

Intersection	
Int Delay, s/veh	20.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	293	0	0	145	97	154	1	92	0	0	0
Future Vol, veh/h	72	293	0	0	145	97	154	1	92	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	114	465	0	0	230	154	244	2	146	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	384	0	-	-	-	0	1000	1077	465
Stage 1	-	-	-	-	-	-	693	693	-
Stage 2	-	-	-	-	-	-	307	384	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1174	-	0	0	-	-	270	219	597
Stage 1	-	-	0	0	-	-	496	445	-
Stage 2	-	-	0	0	-	-	746	611	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1174	-	-	-	-	-	~ 244	0	597
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 244	0	-
Stage 1	-	-	-	-	-	-	448	0	-
Stage 2	-	-	-	-	-	-	746	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	69.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	244	597	1174	-	-	-
HCM Lane V/C Ratio	1.008	0.245	0.097	-	-	-
HCM Control Delay (s)	103.5	13	8.4	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	9.7	1	0.3	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	237	291	45	254	0	0	0	0	129	4	59
Future Vol, veh/h	0	237	291	45	254	0	0	0	0	129	4	59
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	289	355	55	310	0	0	0	0	157	5	72
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	13.4	14.8	12.6
HCM LOS	B	B	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	237	291	45	254	133	59
LT Vol	0	0	45	0	129	0
Through Vol	237	0	0	254	4	0
RT Vol	0	291	0	0	0	59
Lane Flow Rate	289	355	55	310	162	72
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.471	0.508	0.101	0.529	0.333	0.123
Departure Headway (Hd)	5.863	5.153	6.651	6.143	7.381	6.178
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	616	699	538	585	487	579
Service Time	3.601	2.891	4.396	3.888	5.13	3.925
HCM Lane V/C Ratio	0.469	0.508	0.102	0.53	0.333	0.124
HCM Control Delay	13.7	13.1	10.1	15.6	13.8	9.8
HCM Lane LOS	B	B	B	C	B	A
HCM 95th-tile Q	2.5	2.9	0.3	3.1	1.4	0.4

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	399	32	100	203	22	92
Future Vol, veh/h	399	32	100	203	22	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	459	37	115	233	25	106

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	496	0	941	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	463	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1068	-	292	587
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1068	-	260	587
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	557	-
Stage 2	-	-	-	-	634	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	260	587	-	-	1068	-
HCM Lane V/C Ratio	0.097	0.18	-	-	0.108	-
HCM Control Delay (s)	20.3	12.5	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	6	796	3	1	0	623	60	11	2	53	52
Future Volume (veh/h)	61	6	796	3	1	0	623	60	11	2	53	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	63	6	821	3	1	0	642	62	11	2	55	54
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	470	40	1110	246	68	0	770	669	119	175	183	156
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.00	0.43	0.43	0.43	0.10	0.10	0.10
Sat Flow, veh/h	1331	149	1583	525	253	0	1774	1541	273	1774	1863	1583
Grp Volume(v), veh/h	69	0	821	4	0	0	642	0	73	2	55	54
Grp Sat Flow(s),veh/h/ln	1479	0	1583	778	0	0	1774	0	1814	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	19.2	0.0	1.4	0.1	1.6	1.9
Cycle Q Clear(g_c), s	1.8	0.0	16.0	1.8	0.0	0.0	19.2	0.0	1.4	0.1	1.6	1.9
Prop In Lane	0.91		1.00	0.75		0.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	510	0	1110	313	0	0	770	0	788	175	183	156
V/C Ratio(X)	0.14	0.00	0.74	0.01	0.00	0.00	0.83	0.00	0.09	0.01	0.30	0.35
Avail Cap(c_a), veh/h	510	0	1110	313	0	0	770	0	788	474	498	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	5.1	16.1	0.0	0.0	15.0	0.0	10.0	24.4	25.1	25.2
Incr Delay (d2), s/veh	0.1	0.0	2.7	0.0	0.0	0.0	10.3	0.0	0.2	0.0	0.9	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	14.0	0.0	0.0	0.0	11.5	0.0	0.8	0.0	0.9	0.9
LnGrp Delay(d),s/veh	16.8	0.0	7.7	16.1	0.0	0.0	25.3	0.0	10.2	24.4	26.0	26.5
LnGrp LOS	B		A	B			C		B	C	C	C
Approach Vol, veh/h		890			4			715			111	
Approach Delay, s/veh		8.4			16.1			23.8			26.2	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		20.0		9.9		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		21.2		18.0		3.9		3.8
Green Ext Time (p_c), s		1.2		0.0		0.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	14	97	2	41	41	620	21	52	739	13
Future Volume (veh/h)	1	1	14	97	2	41	41	620	21	52	739	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	1	1	15	101	2	43	43	646	22	54	770	14
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	20	186	341	246	209	114	1896	848	134	1945	35
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.06	0.54	0.54	0.08	0.55	0.55
Sat Flow, veh/h	35	153	1412	1392	1863	1583	1774	3539	1583	1774	3556	65
Grp Volume(v), veh/h	17	0	0	101	2	43	43	646	22	54	383	401
Grp Sat Flow(s),veh/h/ln	1600	0	0	1392	1863	1583	1774	1770	1583	1774	1770	1851
Q Serve(g_s), s	0.0	0.0	0.0	2.6	0.0	1.1	1.1	4.8	0.3	1.4	5.8	5.8
Cycle Q Clear(g_c), s	0.4	0.0	0.0	3.0	0.0	1.1	1.1	4.8	0.3	1.4	5.8	5.8
Prop In Lane	0.06		0.88	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	293	0	0	341	246	209	114	1896	848	134	968	1013
V/C Ratio(X)	0.06	0.00	0.00	0.30	0.01	0.21	0.38	0.34	0.03	0.40	0.40	0.40
Avail Cap(c_a), veh/h	626	0	0	635	638	543	266	1896	848	266	968	1013
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	0.0	18.9	17.6	18.1	21.0	6.2	5.1	20.6	6.1	6.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	2.1	0.5	0.1	1.9	1.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.3	0.0	0.5	0.6	2.5	0.1	0.7	3.1	3.2
LnGrp Delay(d),s/veh	17.9	0.0	0.0	19.3	17.6	18.6	23.0	6.6	5.2	22.5	7.3	7.3
LnGrp LOS	B			B	B	B	C	A	A	C	A	A
Approach Vol, veh/h		17			146			711			838	
Approach Delay, s/veh		17.9			19.1			7.6			8.3	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	29.0		10.2	7.0	29.5		10.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.4	6.8		2.4	3.1	7.8		5.0
Green Ext Time (p_c), s	0.0	3.7		0.0	0.0	4.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	692	40	126	364	1029	147	34
Future Volume (veh/h)	191	353	37	257	181	692	40	126	364	1029	147	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	215	397	42	289	203	778	45	142	409	1156	165	38
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	485	51	344	286	1527	187	331	440	1358	1652	739
Arrive On Green	0.10	0.15	0.15	0.03	0.05	0.05	0.11	0.18	0.18	0.39	0.47	0.47
Sat Flow, veh/h	3442	3232	340	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	215	216	223	289	203	778	45	142	409	1156	165	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.1	10.9	27.6	2.3	1.2
Cycle Q Clear(g_c), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.1	10.9	27.6	2.3	1.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	332	265	270	344	286	1527	187	331	440	1358	1652	739
V/C Ratio(X)	0.65	0.82	0.82	0.84	0.71	0.51	0.24	0.43	0.93	0.85	0.10	0.05
Avail Cap(c_a), veh/h	332	315	320	344	352	1626	187	331	440	1358	1652	739
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	39.2	37.0	37.1	42.8	40.7	15.0	36.9	32.9	17.6	24.8	13.4	13.1
Incr Delay (d2), s/veh	4.4	13.2	13.8	13.0	3.8	0.2	0.7	4.0	28.5	5.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	6.2	6.4	4.2	5.3	7.1	1.1	3.5	8.2	14.0	1.2	0.5
LnGrp Delay(d),s/veh	43.6	50.2	50.9	55.8	44.5	15.2	37.6	37.0	46.1	30.0	13.5	13.2
LnGrp LOS	D	D	D	E	D	B	D	D	D	C	B	B
Approach Vol, veh/h		654			1270			596			1359	
Approach Delay, s/veh		48.3			29.1			43.3			27.5	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.5	20.0	13.0	17.5	13.5	46.0	12.7	17.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	33.0	16.0	9.0	16.0	7.0	42.0	8.0	17.0
Max Q Clear Time (g_c+I1), s	29.6	12.9	9.5	12.8	4.1	4.3	7.4	11.7
Green Ext Time (p_c), s	1.7	0.7	0.0	0.7	0.0	1.1	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	34.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	599	545	661	1310	0	0	0	0	235	5	176
Future Volume (veh/h)	0	599	545	661	1310	0	0	0	0	235	5	176
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	624	568	689	1365	0				304	0	124
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1298	581	774	2251	0				976	0	435
Arrive On Green	0.00	0.12	0.12	0.45	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	624	568	689	1365	0				304	0	124
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	14.8	32.2	16.5	0.0	0.0				6.1	0.0	5.5
Cycle Q Clear(g_c), s	0.0	14.8	32.2	16.5	0.0	0.0				6.1	0.0	5.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1298	581	774	2251	0				976	0	435
V/C Ratio(X)	0.00	0.48	0.98	0.89	0.61	0.00				0.31	0.00	0.28
Avail Cap(c_a), veh/h	0	1298	581	994	2477	0				976	0	435
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.42	0.42	0.57	0.57	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.6	39.2	23.7	0.0	0.0				25.9	0.0	25.7
Incr Delay (d2), s/veh	0.0	0.1	19.3	5.0	0.2	0.0				0.8	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	17.3	8.2	0.1	0.0				3.1	0.0	2.6
LnGrp Delay(d),s/veh	0.0	31.7	58.5	28.8	0.2	0.0				26.7	0.0	27.3
LnGrp LOS		C	E	C	A					C		C
Approach Vol, veh/h		1192			2054						428	
Approach Delay, s/veh		44.4			9.8						26.9	
Approach LOS		D			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.2	37.0		28.8		61.2
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			26.0	33.0		19.0		63.0
Max Q Clear Time (g_c+I1), s			18.5	34.2		8.1		2.0
Green Ext Time (p_c), s			1.7	0.0		1.2		16.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	789	0	0	1498	444	515	0	553	0	0	0
Future Volume (veh/h)	60	789	0	0	1498	444	515	0	553	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	65	848	0	0	1611	477	745	0	390			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	111	2384	0	0	1840	573	1569	0	700			
Arrive On Green	0.12	0.94	0.00	0.00	0.72	0.72	0.44	0.00	0.44			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	65	848	0	0	1611	477	745	0	390			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	3.1	1.4	0.0	0.0	21.5	18.8	13.3	0.0	16.4			
Cycle Q Clear(g_c), s	3.1	1.4	0.0	0.0	21.5	18.8	13.3	0.0	16.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	111	2384	0	0	1840	573	1569	0	700			
V/C Ratio(X)	0.59	0.36	0.00	0.00	0.88	0.83	0.47	0.00	0.56			
Avail Cap(c_a), veh/h	158	2712	0	0	2034	633	1569	0	700			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.83	0.83	0.00	0.00	0.69	0.69	1.00	0.00	1.00			
Uniform Delay (d), s/veh	38.3	1.5	0.0	0.0	10.9	10.5	17.7	0.0	18.6			
Incr Delay (d2), s/veh	4.0	0.1	0.0	0.0	3.0	6.1	1.0	0.0	3.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.5	0.0	0.0	10.0	8.6	6.7	0.0	7.8			
LnGrp Delay(d),s/veh	42.3	1.6	0.0	0.0	13.9	16.6	18.7	0.0	21.8			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		913			2088			1135				
Approach Delay, s/veh		4.5			14.5			19.8				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		43.8		46.2			9.6	36.6
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		34.0		48.0			8.0	36.0
Max Q Clear Time (g_c+I1), s		18.4		3.4			5.1	23.5
Green Ext Time (p_c), s		4.0		6.3			0.0	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	923	104	119	1417	168	82	130	92	70	89	445
Future Volume (veh/h)	317	923	104	119	1417	168	82	130	92	70	89	445
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	348	1014	114	131	1557	185	90	143	101	77	98	489
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	2128	662	164	1897	469	344	362	256	364	663	903
Arrive On Green	0.43	0.84	0.84	0.09	0.30	0.30	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	825	1017	719	1131	1863	1583
Grp Volume(v), veh/h	348	1014	114	131	1557	185	90	0	244	77	98	489
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	825	0	1736	1131	1863	1583
Q Serve(g_s), s	16.6	4.9	1.2	6.5	20.3	8.4	7.5	0.0	9.5	4.9	3.2	17.3
Cycle Q Clear(g_c), s	16.6	4.9	1.2	6.5	20.3	8.4	10.7	0.0	9.5	14.4	3.2	17.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	381	2128	662	164	1897	469	344	0	618	364	663	903
V/C Ratio(X)	0.91	0.48	0.17	0.80	0.82	0.39	0.26	0.00	0.39	0.21	0.15	0.54
Avail Cap(c_a), veh/h	552	2430	756	256	1994	493	344	0	618	364	663	903
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	4.7	4.4	40.0	29.5	25.2	23.3	0.0	21.7	27.1	19.7	12.0
Incr Delay (d2), s/veh	14.3	0.2	0.1	9.4	2.8	0.5	1.8	0.0	1.9	1.3	0.5	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	2.1	0.5	3.6	9.3	3.7	1.9	0.0	4.9	1.7	1.7	8.0
LnGrp Delay(d),s/veh	39.3	4.8	4.5	49.4	32.2	25.8	25.2	0.0	23.6	28.4	20.2	14.3
LnGrp LOS	D	A	A	D	C	C	C		C	C	C	B
Approach Vol, veh/h		1476			1873			334			664	
Approach Delay, s/veh		12.9			32.8			24.0			16.8	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	12.3	41.7		36.0	23.3	30.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		22.0	13.0	43.0		22.0	28.0	28.0
Max Q Clear Time (g_c+I1), s		12.7	8.5	6.9		19.3	18.6	22.3
Green Ext Time (p_c), s		1.3	0.1	8.2		0.8	0.7	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	859	24	6	488	24	1	2	8	36	4	4
Future Vol, veh/h	6	859	24	6	488	24	1	2	8	36	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	904	25	6	514	25	1	2	8	38	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	539	0	0	929	0	0	1470	1480	917	1469	1480	527
Stage 1	-	-	-	-	-	-	929	929	-	539	539	-
Stage 2	-	-	-	-	-	-	541	551	-	930	941	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1029	-	-	736	-	-	105	125	330	106	125	551
Stage 1	-	-	-	-	-	-	321	346	-	527	522	-
Stage 2	-	-	-	-	-	-	525	515	-	321	342	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1029	-	-	736	-	-	100	123	330	101	123	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	123	-	101	123	-
Stage 1	-	-	-	-	-	-	319	344	-	524	518	-
Stage 2	-	-	-	-	-	-	513	511	-	309	340	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	22	57.7
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	114	330	1029	-	-	736	-	-	103	551
HCM Lane V/C Ratio	0.028	0.026	0.006	-	-	0.009	-	-	0.409	0.008
HCM Control Delay (s)	37.5	16.2	8.5	-	-	9.9	-	-	62.3	11.6
HCM Lane LOS	E	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	1.7	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	482	226	21	395	130	158	150	15	196	178	93
Future Volume (veh/h)	126	482	226	21	395	130	158	150	15	196	178	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	131	502	235	22	411	135	165	156	16	204	185	97
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	175	1130	506	63	477	406	206	830	84	249	992	444
Arrive On Green	0.10	0.32	0.32	0.04	0.26	0.26	0.12	0.26	0.26	0.14	0.28	0.28
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3245	329	1774	3539	1583
Grp Volume(v), veh/h	131	502	235	22	411	135	165	84	88	204	185	97
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1805	1774	1770	1583
Q Serve(g_s), s	4.6	7.2	7.6	0.8	13.5	4.5	5.8	2.4	2.4	7.2	2.6	3.0
Cycle Q Clear(g_c), s	4.6	7.2	7.6	0.8	13.5	4.5	5.8	2.4	2.4	7.2	2.6	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	175	1130	506	63	477	406	206	453	461	249	992	444
V/C Ratio(X)	0.75	0.44	0.46	0.35	0.86	0.33	0.80	0.19	0.19	0.82	0.19	0.22
Avail Cap(c_a), veh/h	221	1130	506	193	551	468	249	453	461	304	992	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	17.3	17.5	30.3	22.8	19.4	27.7	18.7	18.7	26.8	17.6	17.7
Incr Delay (d2), s/veh	10.3	0.3	0.7	3.3	11.8	0.5	14.4	0.9	0.9	13.5	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.5	3.4	0.4	8.5	2.0	3.7	1.3	1.3	4.5	1.3	1.4
LnGrp Delay(d),s/veh	38.4	17.6	18.1	33.6	34.6	19.9	42.0	19.6	19.6	40.3	18.0	18.9
LnGrp LOS	D	B	B	C	C	B	D	B	B	D	B	B
Approach Vol, veh/h		868			568			337			486	
Approach Delay, s/veh		20.9			31.1			30.6			27.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	20.4	6.3	24.5	11.5	22.0	10.3	20.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	16.0	7.0	20.0	9.0	18.0	8.0	19.0
Max Q Clear Time (g_c+I1), s	9.2	4.4	2.8	9.6	7.8	5.0	6.6	15.5
Green Ext Time (p_c), s	0.1	0.6	0.0	2.8	0.0	1.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	11.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	124	154	0	0	97	46	277	2	24	0	0	0
Future Vol, veh/h	124	154	0	0	97	46	277	2	24	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	159	0	0	100	47	286	2	25	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	147	0	-	-	-	0	539	562	159
Stage 1	-	-	-	-	-	-	415	415	-
Stage 2	-	-	-	-	-	-	124	147	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	0	0	-	-	503	436	886
Stage 1	-	-	0	0	-	-	666	592	-
Stage 2	-	-	0	0	-	-	902	775	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1435	-	-	-	-	-	458	0	886
Mov Cap-2 Maneuver	-	-	-	-	-	-	458	0	-
Stage 1	-	-	-	-	-	-	607	0	-
Stage 2	-	-	-	-	-	-	902	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.5	0	23.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	458	886	1435	-	-	-
HCM Lane V/C Ratio	0.628	0.028	0.089	-	-	-
HCM Control Delay (s)	25.2	9.2	7.8	-	-	-
HCM Lane LOS	D	A	A	-	-	-
HCM 95th %tile Q(veh)	4.2	0.1	0.3	-	-	-

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	214	275	21	353	0	0	0	0	67	1	135
Future Vol, veh/h	0	214	275	21	353	0	0	0	0	67	1	135
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	218	281	21	360	0	0	0	0	68	1	138
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	11	15.7	10.6
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	99%	0%
Vol Thru, %	100%	0%	0%	100%	1%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	214	275	21	353	68	135
LT Vol	0	0	21	0	67	0
Through Vol	214	0	0	353	1	0
RT Vol	0	275	0	0	0	135
Lane Flow Rate	218	281	21	360	69	138
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.343	0.386	0.037	0.576	0.137	0.227
Departure Headway (Hd)	5.659	4.951	6.266	5.761	7.132	5.922
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	727	572	627	504	606
Service Time	3.385	2.676	3.994	3.488	4.866	3.656
HCM Lane V/C Ratio	0.343	0.387	0.037	0.574	0.137	0.228
HCM Control Delay	11.3	10.8	9.2	16.1	11	10.4
HCM Lane LOS	B	B	A	C	B	B
HCM 95th-tile Q	1.5	1.8	0.1	3.7	0.5	0.9

Intersection	
Int Delay, s/veh	6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	57	201	281	82	225
Future Vol, veh/h	211	57	201	281	82	225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	229	62	218	305	89	245

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	291	0	1001	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	741	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1271	-	269	779
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	471	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1271	-	223	779
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	471	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	223	779	-	-	1271	-
HCM Lane V/C Ratio	0.4	0.314	-	-	0.172	-
HCM Control Delay (s)	31.5	11.7	-	-	8.4	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.8	1.3	-	-	0.6	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	11	854	23	16	11	871	208	14	3	189	107
Future Volume (veh/h)	80	11	854	23	16	11	871	208	14	3	189	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	84	12	899	24	17	12	917	219	15	3	199	113
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	41	1149	122	82	42	955	928	64	238	250	212
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.54	0.54	0.54	0.13	0.13	0.13
Sat Flow, veh/h	1296	218	1583	323	436	222	1774	1724	118	1774	1863	1583
Grp Volume(v), veh/h	96	0	899	53	0	0	917	0	234	3	199	113
Grp Sat Flow(s),veh/h/ln	1514	0	1583	981	0	0	1774	0	1842	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.1	0.0	0.0	42.2	0.0	5.7	0.1	8.9	5.7
Cycle Q Clear(g_c), s	3.9	0.0	16.0	4.0	0.0	0.0	42.2	0.0	5.7	0.1	8.9	5.7
Prop In Lane	0.87		1.00	0.45		0.23	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	363	0	1149	245	0	0	955	0	992	238	250	212
V/C Ratio(X)	0.26	0.00	0.78	0.22	0.00	0.00	0.96	0.00	0.24	0.01	0.80	0.53
Avail Cap(c_a), veh/h	363	0	1149	245	0	0	955	0	992	332	349	296
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	5.4	29.1	0.0	0.0	18.9	0.0	10.4	32.1	35.9	34.5
Incr Delay (d2), s/veh	0.4	0.0	3.6	0.4	0.0	0.0	21.0	0.0	0.6	0.0	8.5	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	22.1	1.1	0.0	0.0	25.9	0.0	3.1	0.1	5.1	2.6
LnGrp Delay(d),s/veh	30.2	0.0	9.0	29.5	0.0	0.0	39.8	0.0	11.0	32.1	44.3	36.6
LnGrp LOS	C		A	C			D		B	C	D	D
Approach Vol, veh/h		995			53			1151			315	
Approach Delay, s/veh		11.0			29.5			34.0			41.4	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		15.5		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		44.2		18.0		10.9		6.0
Green Ext Time (p_c), s		1.0		0.0		0.6		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	4	46	247	2	105	45	939	25	98	918	11
Future Volume (veh/h)	18	4	46	247	2	105	45	939	25	98	918	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	4	49	263	2	112	48	999	27	104	977	12
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	57	236	445	413	351	118	1619	724	180	1764	22
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.46	0.46	0.10	0.49	0.49
Sat Flow, veh/h	242	257	1064	1346	1863	1583	1774	3539	1583	1774	3581	44
Grp Volume(v), veh/h	72	0	0	263	2	112	48	999	27	104	483	506
Grp Sat Flow(s),veh/h/ln	1563	0	0	1346	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	7.6	0.0	3.2	1.4	11.7	0.5	3.1	10.4	10.4
Cycle Q Clear(g_c), s	1.9	0.0	0.0	9.6	0.0	3.2	1.4	11.7	0.5	3.1	10.4	10.4
Prop In Lane	0.26		0.68	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	429	0	0	445	413	351	118	1619	724	180	872	914
V/C Ratio(X)	0.17	0.00	0.00	0.59	0.00	0.32	0.41	0.62	0.04	0.58	0.55	0.55
Avail Cap(c_a), veh/h	536	0	0	541	545	463	227	1619	724	227	872	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	20.1	16.6	17.8	24.5	11.2	8.2	23.4	9.7	9.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.3	0.0	0.5	2.3	1.8	0.1	2.9	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	3.9	0.0	1.5	0.8	5.9	0.2	1.6	5.6	5.8
LnGrp Delay(d),s/veh	17.5	0.0	0.0	21.3	16.6	18.3	26.8	13.0	8.3	26.3	12.2	12.1
LnGrp LOS	B			C	B	B	C	B	A	C	B	B
Approach Vol, veh/h		72			377			1074			1093	
Approach Delay, s/veh		17.5			20.4			13.5			13.5	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	29.0		16.1	7.6	30.9		16.1
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	5.1	13.7		3.9	3.4	12.4		11.6
Green Ext Time (p_c), s	0.0	4.8		0.2	0.0	4.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	692	40	126	364	985	141	33
Future Volume (veh/h)	191	353	37	257	181	692	40	126	364	985	141	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	205	380	40	276	195	744	43	135	391	1059	152	35
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	499	52	301	289	1269	96	481	547	1032	1785	798
Arrive On Green	0.09	0.15	0.15	0.03	0.05	0.05	0.05	0.26	0.26	0.30	0.50	0.50
Sat Flow, veh/h	3442	3234	339	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	205	207	213	276	195	744	43	135	391	1059	152	35
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	4.6	9.0	9.1	6.4	8.2	8.1	1.9	4.6	17.2	24.0	1.8	0.6
Cycle Q Clear(g_c), s	4.6	9.0	9.1	6.4	8.2	8.1	1.9	4.6	17.2	24.0	1.8	0.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	298	273	278	301	289	1269	96	481	547	1032	1785	798
V/C Ratio(X)	0.69	0.76	0.77	0.92	0.67	0.59	0.45	0.28	0.71	1.03	0.09	0.04
Avail Cap(c_a), veh/h	301	354	361	301	373	1393	155	481	547	1032	1785	798
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	35.5	32.4	32.4	38.6	36.0	6.9	36.7	23.7	22.7	28.0	10.3	3.9
Incr Delay (d2), s/veh	6.4	6.8	7.1	26.9	2.6	0.4	3.3	1.5	7.8	31.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.9	5.0	4.2	4.5	3.2	1.0	2.6	8.6	15.9	0.9	0.3
LnGrp Delay(d),s/veh	41.9	39.2	39.5	65.4	38.5	7.3	40.0	25.2	30.5	59.6	10.3	4.0
LnGrp LOS	D	D	D	E	D	A	D	C	C	F	B	A
Approach Vol, veh/h		625			1215			569			1246	
Approach Delay, s/veh		40.2			25.5			30.0			52.0	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	24.6	11.0	16.4	8.3	44.3	10.9	16.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	24.0	17.0	7.0	16.0	7.0	34.0	7.0	16.0
Max Q Clear Time (g_c+I1), s	26.0	19.2	8.4	11.1	3.9	3.8	6.6	10.2
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.9	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1145	560	587	1285	0	0	0	0	562	0	142
Future Volume (veh/h)	0	1145	560	587	1285	0	0	0	0	562	0	142
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1168	571	599	1311	0				618	0	97
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1327	594	670	2193	0				995	0	444
Arrive On Green	0.00	0.12	0.12	0.39	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1168	571	599	1311	0				618	0	97
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	26.0	28.7	13.0	0.0	0.0				12.1	0.0	3.8
Cycle Q Clear(g_c), s	0.0	26.0	28.7	13.0	0.0	0.0				12.1	0.0	3.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1327	594	670	2193	0				995	0	444
V/C Ratio(X)	0.00	0.88	0.96	0.89	0.60	0.00				0.62	0.00	0.22
Avail Cap(c_a), veh/h	0	1327	594	731	2256	0				995	0	444
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.47	0.47	0.58	0.58	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.3	34.5	23.7	0.0	0.0				25.1	0.0	22.1
Incr Delay (d2), s/veh	0.0	3.6	17.0	8.1	0.2	0.0				2.9	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.4	15.4	6.9	0.1	0.0				6.3	0.0	1.8
LnGrp Delay(d),s/veh	0.0	36.8	51.4	31.8	0.2	0.0				28.0	0.0	23.2
LnGrp LOS		D	D	C	A					C		C
Approach Vol, veh/h		1739			1910						715	
Approach Delay, s/veh		41.6			10.1						27.4	
Approach LOS		D			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			19.6	34.0		26.4		53.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			17.0	30.0		21.0		51.0
Max Q Clear Time (g_c+I1), s			15.0	30.7		14.1		2.0
Green Ext Time (p_c), s			0.5	0.0		1.7		14.3

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1619	0	0	1330	378	510	0	708	0	0	0
Future Volume (veh/h)	117	1619	0	0	1330	378	510	0	708	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	119	1652	0	0	1357	386	776	0	448			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	149	2229	0	0	1548	482	1638	0	731			
Arrive On Green	0.17	0.88	0.00	0.00	0.61	0.61	0.46	0.00	0.46			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	119	1652	0	0	1357	386	776	0	448			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	5.2	9.2	0.0	0.0	17.9	14.9	12.1	0.0	17.0			
Cycle Q Clear(g_c), s	5.2	9.2	0.0	0.0	17.9	14.9	12.1	0.0	17.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	149	2229	0	0	1548	482	1638	0	731			
V/C Ratio(X)	0.80	0.74	0.00	0.00	0.88	0.80	0.47	0.00	0.61			
Avail Cap(c_a), veh/h	222	2543	0	0	1653	515	1638	0	731			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.44	0.44	0.00	0.00	0.67	0.67	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.6	3.3	0.0	0.0	14.4	13.8	14.8	0.0	16.2			
Incr Delay (d2), s/veh	5.5	0.5	0.0	0.0	3.7	5.8	1.0	0.0	3.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.7	3.7	0.0	0.0	8.6	7.0	6.0	0.0	8.1			
LnGrp Delay(d),s/veh	38.1	3.8	0.0	0.0	18.1	19.6	15.8	0.0	20.0			
LnGrp LOS	D	A			B	B	B		B			
Approach Vol, veh/h		1771			1743			1224				
Approach Delay, s/veh		6.1			18.4			17.3				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		40.9		39.1			10.7	28.4
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		32.0		40.0			10.0	26.0
Max Q Clear Time (g_c+I1), s		19.0		11.2			7.2	19.9
Green Ext Time (p_c), s		4.1		13.9			0.1	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	1729	168	132	1266	74	93	106	166	58	67	348
Future Volume (veh/h)	430	1729	168	132	1266	74	93	106	166	58	67	348
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	439	1764	171	135	1292	76	95	108	169	59	68	355
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	2089	650	170	1542	381	396	225	352	325	640	965
Arrive On Green	0.53	0.82	0.82	0.10	0.24	0.24	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	960	656	1026	1098	1863	1583
Grp Volume(v), veh/h	439	1764	171	135	1292	76	95	0	277	59	68	355
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	960	0	1682	1098	1863	1583
Q Serve(g_s), s	18.3	16.2	2.0	6.0	15.3	3.1	6.0	0.0	10.4	3.6	2.0	0.0
Cycle Q Clear(g_c), s	18.3	16.2	2.0	6.0	15.3	3.1	8.0	0.0	10.4	13.9	2.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	472	2089	650	170	1542	381	396	0	577	325	640	965
V/C Ratio(X)	0.93	0.84	0.26	0.79	0.84	0.20	0.24	0.00	0.48	0.18	0.11	0.37
Avail Cap(c_a), veh/h	643	2352	732	266	1602	396	396	0	577	325	640	965
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	5.6	4.4	35.4	28.9	24.2	20.6	0.0	20.6	26.1	17.9	7.9
Incr Delay (d2), s/veh	12.7	1.9	0.1	8.5	4.0	0.3	1.4	0.0	2.8	1.2	0.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	7.2	0.8	3.3	7.2	1.4	1.7	0.0	5.2	1.2	1.1	4.1
LnGrp Delay(d),s/veh	30.7	7.6	4.5	43.9	32.9	24.5	22.0	0.0	23.5	27.3	18.2	8.9
LnGrp LOS	C	A	A	D	C	C	C		C	C	B	A
Approach Vol, veh/h		2374			1503			372			482	
Approach Delay, s/veh		11.6			33.4			23.1			12.5	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		31.5	11.7	36.9		31.5	25.3	23.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	12.0	37.0		19.0	29.0	20.0
Max Q Clear Time (g_c+I1), s		12.4	8.0	18.2		15.9	20.3	17.3
Green Ext Time (p_c), s		1.1	0.1	12.2		0.6	0.9	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	895	1	6	850	100	0	2	9	27	1	5
Future Vol, veh/h	1	895	1	6	850	100	0	2	9	27	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	984	1	7	934	110	0	2	10	30	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1044	0	0	985	0	0	1991	2045	985	1991	1990	989
Stage 1	-	-	-	-	-	-	987	987	-	1003	1003	-
Stage 2	-	-	-	-	-	-	1004	1058	-	988	987	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	666	-	-	701	-	-	45	56	301	45	61	299
Stage 1	-	-	-	-	-	-	298	325	-	292	320	-
Stage 2	-	-	-	-	-	-	291	301	-	297	325	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	666	-	-	701	-	-	43	55	301	42	60	299
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	55	-	42	60	-
Stage 1	-	-	-	-	-	-	297	324	-	291	317	-
Stage 2	-	-	-	-	-	-	282	298	-	285	324	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	27.5	180
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	55	301	666	-	-	701	-	-	42	299
HCM Lane V/C Ratio	0.04	0.033	0.002	-	-	0.009	-	-	0.733	0.018
HCM Control Delay (s)	73.2	17.4	10.4	-	-	10.2	-	-	209.1	17.3
HCM Lane LOS	F	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	2.8	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	664	284	48	531	305	210	326	18	188	261	167
Future Volume (veh/h)	159	664	284	48	531	305	210	326	18	188	261	167
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	167	699	299	51	559	321	221	343	19	198	275	176
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	201	1327	594	106	599	509	245	791	44	235	801	358
Arrive On Green	0.11	0.38	0.38	0.06	0.32	0.32	0.14	0.23	0.23	0.13	0.23	0.23
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3411	188	1774	3539	1583
Grp Volume(v), veh/h	167	699	299	51	559	321	221	177	185	198	275	176
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1830	1774	1770	1583
Q Serve(g_s), s	7.3	12.2	11.6	2.2	23.2	13.7	9.8	6.8	6.9	8.7	5.2	7.7
Cycle Q Clear(g_c), s	7.3	12.2	11.6	2.2	23.2	13.7	9.8	6.8	6.9	8.7	5.2	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	201	1327	594	106	599	509	245	410	424	235	801	358
V/C Ratio(X)	0.83	0.53	0.50	0.48	0.93	0.63	0.90	0.43	0.44	0.84	0.34	0.49
Avail Cap(c_a), veh/h	201	1327	594	156	609	517	245	410	424	245	801	358
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	19.4	19.2	36.2	26.2	23.0	33.8	26.1	26.1	33.7	25.8	26.8
Incr Delay (d2), s/veh	24.7	0.4	0.7	3.4	21.5	2.4	32.6	3.3	3.2	21.7	1.2	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	6.0	5.2	1.2	15.4	6.3	7.0	3.7	3.8	5.7	2.7	3.8
LnGrp Delay(d),s/veh	59.3	19.8	19.8	39.6	47.7	25.4	66.4	29.4	29.3	55.4	27.0	31.6
LnGrp LOS	E	B	B	D	D	C	E	C	C	E	C	C
Approach Vol, veh/h		1165			931			583			649	
Approach Delay, s/veh		25.4			39.5			43.4			36.9	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	22.4	8.7	33.8	15.0	22.0	13.0	29.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	18.0	7.0	28.0	11.0	18.0	9.0	26.0
Max Q Clear Time (g_c+I1), s	10.7	8.9	4.2	14.2	11.8	9.7	9.3	25.2
Green Ext Time (p_c), s	0.0	1.2	0.0	4.6	0.0	1.4	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	28.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Future Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	144	465	0	0	230	154	244	2	146	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	384	0	-	-	-	0	1060	1137	465
Stage 1	-	-	-	-	-	-	753	753	-
Stage 2	-	-	-	-	-	-	307	384	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1174	-	0	0	-	-	248	202	597
Stage 1	-	-	0	0	-	-	465	417	-
Stage 2	-	-	0	0	-	-	746	611	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1174	-	-	-	-	-	~ 217	0	597
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 217	0	-
Stage 1	-	-	-	-	-	-	408	0	-
Stage 2	-	-	-	-	-	-	746	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	98
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	217	597	1174	-	-	-
HCM Lane V/C Ratio	1.134	0.245	0.123	-	-	-
HCM Control Delay (s)	148.5	13	8.5	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	11.6	1	0.4	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	256	291	45	254	0	0	0	0	129	4	79
Future Vol, veh/h	0	256	291	45	254	0	0	0	0	129	4	79
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	312	355	55	310	0	0	0	0	157	5	96
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	14.2	15.3	12.6
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	256	291	45	254	133	79
LT Vol	0	0	45	0	129	0
Through Vol	256	0	0	254	4	0
RT Vol	0	291	0	0	0	79
Lane Flow Rate	312	355	55	310	162	96
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.516	0.516	0.103	0.539	0.336	0.167
Departure Headway (Hd)	5.949	5.239	6.771	6.262	7.447	6.242
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	606	685	528	576	483	573
Service Time	3.694	2.984	4.523	4.014	5.198	3.993
HCM Lane V/C Ratio	0.515	0.518	0.104	0.538	0.335	0.168
HCM Control Delay	14.9	13.5	10.3	16.2	13.9	10.3
HCM Lane LOS	B	B	B	C	B	B
HCM 95th-tile Q	3	3	0.3	3.2	1.5	0.6

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	399	32	120	203	22	111
Future Vol, veh/h	399	32	120	203	22	111
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	459	37	138	233	25	128

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	496	0	987	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	509	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1068	-	274	587
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1068	-	239	587
Mov Cap-2 Maneuver	-	-	-	-	239	-
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	604	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.3	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	239	587	-	-	1068	-
HCM Lane V/C Ratio	0.106	0.217	-	-	0.129	-
HCM Control Delay (s)	21.8	12.8	-	-	8.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.8	-	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	6	796	3	1	0	650	69	11	2	88	52
Future Volume (veh/h)	71	6	796	3	1	0	650	69	11	2	88	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	73	6	821	3	1	0	731	0	0	2	91	54
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	473	34	1101	241	66	0	1527	802	0	4	193	168
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.00	0.43	0.00	0.00	0.11	0.11	0.11
Sat Flow, veh/h	1352	130	1583	515	249	0	3548	1863	0	40	1821	1583
Grp Volume(v), veh/h	79	0	821	4	0	0	731	0	0	93	0	54
Grp Sat Flow(s),veh/h/ln	1482	0	1583	764	0	0	1774	1863	0	1861	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	8.9	0.0	0.0	2.8	0.0	1.9
Cycle Q Clear(g_c), s	2.1	0.0	16.0	2.1	0.0	0.0	8.9	0.0	0.0	2.8	0.0	1.9
Prop In Lane	0.92		1.00	0.75		0.00	1.00		0.00	0.02		1.00
Lane Grp Cap(c), veh/h	507	0	1101	307	0	0	1527	802	0	197	0	168
V/C Ratio(X)	0.16	0.00	0.75	0.01	0.00	0.00	0.48	0.00	0.00	0.47	0.00	0.32
Avail Cap(c_a), veh/h	507	0	1101	307	0	0	1527	802	0	493	0	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	5.2	16.4	0.0	0.0	12.3	0.0	0.0	25.4	0.0	25.0
Incr Delay (d2), s/veh	0.1	0.0	2.8	0.0	0.0	0.0	1.1	0.0	0.0	1.7	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	14.3	0.1	0.0	0.0	4.6	0.0	0.0	1.5	0.0	0.9
LnGrp Delay(d),s/veh	17.2	0.0	8.1	16.4	0.0	0.0	13.4	0.0	0.0	27.2	0.0	26.1
LnGrp LOS	B		A	B			B			C		C
Approach Vol, veh/h		900			4			731			147	
Approach Delay, s/veh		8.9			16.4			13.4			26.8	
Approach LOS		A			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		20.0		10.4		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		10.9		18.0		4.8		4.1
Green Ext Time (p_c), s		2.4		0.0		0.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	15	98	2	41	41	657	21	52	774	13
Future Volume (veh/h)	1	1	15	98	2	41	41	657	21	52	774	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	1	1	16	102	2	43	43	684	22	54	806	14
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	19	188	342	246	209	114	1895	848	134	1946	34
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.06	0.54	0.54	0.08	0.55	0.55
Sat Flow, veh/h	33	144	1422	1390	1863	1583	1774	3539	1583	1774	3560	62
Grp Volume(v), veh/h	18	0	0	102	2	43	43	684	22	54	401	419
Grp Sat Flow(s),veh/h/ln	1599	0	0	1390	1863	1583	1774	1770	1583	1774	1770	1852
Q Serve(g_s), s	0.0	0.0	0.0	2.6	0.0	1.1	1.1	5.2	0.3	1.4	6.2	6.2
Cycle Q Clear(g_c), s	0.5	0.0	0.0	3.1	0.0	1.1	1.1	5.2	0.3	1.4	6.2	6.2
Prop In Lane	0.06		0.89	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	293	0	0	342	246	209	114	1895	848	134	967	1012
V/C Ratio(X)	0.06	0.00	0.00	0.30	0.01	0.21	0.38	0.36	0.03	0.40	0.41	0.41
Avail Cap(c_a), veh/h	626	0	0	634	638	542	266	1895	848	266	967	1012
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	0.0	18.9	17.6	18.1	21.0	6.3	5.1	20.6	6.2	6.2
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	2.1	0.5	0.1	1.9	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.3	0.0	0.5	0.6	2.6	0.1	0.7	3.4	3.5
LnGrp Delay(d),s/veh	17.9	0.0	0.0	19.4	17.6	18.6	23.0	6.8	5.2	22.5	7.5	7.5
LnGrp LOS	B			B	B	B	C	A	A	C	A	A
Approach Vol, veh/h		18			147			749			874	
Approach Delay, s/veh		17.9			19.1			7.7			8.4	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	29.0		10.2	7.0	29.5		10.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.4	7.2		2.5	3.1	8.2		5.1
Green Ext Time (p_c), s	0.0	3.9		0.0	0.0	4.3		0.3

Intersection Summary		
HCM 2010 Ctrl Delay		9.1
HCM 2010 LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	726	40	128	364	1063	150	35
Future Volume (veh/h)	191	353	37	257	181	726	40	128	364	1063	150	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	215	397	42	289	203	816	45	144	409	1194	169	39
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	485	51	344	288	1530	187	331	440	1358	1652	739
Arrive On Green	0.10	0.15	0.15	0.03	0.05	0.05	0.11	0.18	0.18	0.39	0.47	0.47
Sat Flow, veh/h	3442	3232	340	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	215	216	223	289	203	816	45	144	409	1194	169	39
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.2	10.9	29.0	2.4	1.2
Cycle Q Clear(g_c), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.2	10.9	29.0	2.4	1.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	265	270	344	288	1530	187	331	440	1358	1652	739
V/C Ratio(X)	0.65	0.82	0.82	0.84	0.71	0.53	0.24	0.43	0.93	0.88	0.10	0.05
Avail Cap(c_a), veh/h	329	315	320	344	352	1626	187	331	440	1358	1652	739
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	39.3	37.0	37.1	42.8	40.7	15.3	36.9	33.0	17.6	25.3	13.4	13.1
Incr Delay (d2), s/veh	4.6	13.2	13.8	12.8	3.6	0.2	0.7	4.1	28.5	6.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	6.2	6.4	4.2	5.3	7.6	1.1	3.6	8.2	15.0	1.2	0.6
LnGrp Delay(d),s/veh	43.9	50.2	50.9	55.6	44.3	15.5	37.6	37.1	46.1	31.9	13.6	13.3
LnGrp LOS	D	D	D	E	D	B	D	D	D	C	B	B
Approach Vol, veh/h		654			1308			598			1402	
Approach Delay, s/veh		48.4			28.9			43.3			29.1	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.5	20.0	13.0	17.5	13.5	46.0	12.6	17.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	33.0	16.0	9.0	16.0	7.0	42.0	8.0	17.0
Max Q Clear Time (g_c+I1), s	31.0	12.9	9.5	12.8	4.1	4.4	7.4	11.7
Green Ext Time (p_c), s	1.1	0.7	0.0	0.7	0.0	1.1	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	609	569	661	1344	0	0	0	0	235	5	176
Future Volume (veh/h)	0	609	569	661	1344	0	0	0	0	235	5	176
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	634	593	689	1400	0				304	0	124
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1298	581	774	2251	0				976	0	435
Arrive On Green	0.00	0.12	0.12	0.45	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	634	593	689	1400	0				304	0	124
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	15.1	33.0	16.5	0.0	0.0				6.1	0.0	5.5
Cycle Q Clear(g_c), s	0.0	15.1	33.0	16.5	0.0	0.0				6.1	0.0	5.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1298	581	774	2251	0				976	0	435
V/C Ratio(X)	0.00	0.49	1.02	0.89	0.62	0.00				0.31	0.00	0.28
Avail Cap(c_a), veh/h	0	1298	581	994	2477	0				976	0	435
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.39	0.39	0.56	0.56	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.7	39.6	23.7	0.0	0.0				25.9	0.0	25.7
Incr Delay (d2), s/veh	0.0	0.1	29.0	5.0	0.2	0.0				0.8	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.4	19.1	8.2	0.1	0.0				3.1	0.0	2.6
LnGrp Delay(d),s/veh	0.0	31.8	68.5	28.7	0.2	0.0				26.7	0.0	27.3
LnGrp LOS		C	F	C	A					C		C
Approach Vol, veh/h		1227			2089						428	
Approach Delay, s/veh		49.5			9.6						26.9	
Approach LOS		D			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.2	37.0		28.8		61.2
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			26.0	33.0		19.0		63.0
Max Q Clear Time (g_c+I1), s			18.5	35.0		8.1		2.0
Green Ext Time (p_c), s			1.7	0.0		1.2		16.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	799	0	0	1508	444	539	0	553	0	0	0
Future Volume (veh/h)	60	799	0	0	1508	444	539	0	553	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	65	859	0	0	1622	477	767	0	394			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	111	2391	0	0	1847	575	1564	0	698			
Arrive On Green	0.12	0.94	0.00	0.00	0.73	0.73	0.44	0.00	0.44			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	65	859	0	0	1622	477	767	0	394			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	3.1	1.4	0.0	0.0	21.7	18.7	13.9	0.0	16.7			
Cycle Q Clear(g_c), s	3.1	1.4	0.0	0.0	21.7	18.7	13.9	0.0	16.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	111	2391	0	0	1847	575	1564	0	698			
V/C Ratio(X)	0.59	0.36	0.00	0.00	0.88	0.83	0.49	0.00	0.56			
Avail Cap(c_a), veh/h	158	2712	0	0	2034	633	1564	0	698			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.82	0.82	0.00	0.00	0.69	0.69	1.00	0.00	1.00			
Uniform Delay (d), s/veh	38.3	1.5	0.0	0.0	10.8	10.4	17.9	0.0	18.7			
Incr Delay (d2), s/veh	4.0	0.1	0.0	0.0	3.1	5.9	1.1	0.0	3.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.5	0.0	0.0	10.1	8.6	7.1	0.0	7.9			
LnGrp Delay(d),s/veh	42.3	1.5	0.0	0.0	13.9	16.3	19.0	0.0	22.0			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		924			2099			1161				
Approach Delay, s/veh		4.4			14.5			20.1				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		43.7		46.3			9.6	36.7
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		34.0		48.0			8.0	36.0
Max Q Clear Time (g_c+I1), s		18.7		3.4			5.1	23.7
Green Ext Time (p_c), s		4.1		6.4			0.0	9.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	933	104	119	1427	168	82	130	92	70	89	445
Future Volume (veh/h)	317	933	104	119	1427	168	82	130	92	70	89	445
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	348	1025	114	131	1568	185	90	143	101	77	98	489
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	2132	664	164	1902	470	344	361	255	363	662	902
Arrive On Green	0.43	0.84	0.84	0.09	0.30	0.30	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	825	1017	719	1131	1863	1583
Grp Volume(v), veh/h	348	1025	114	131	1568	185	90	0	244	77	98	489
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	825	0	1736	1131	1863	1583
Q Serve(g_s), s	16.6	4.9	1.2	6.5	20.5	8.4	7.5	0.0	9.5	4.9	3.2	17.3
Cycle Q Clear(g_c), s	16.6	4.9	1.2	6.5	20.5	8.4	10.7	0.0	9.5	14.4	3.2	17.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	381	2132	664	164	1902	470	344	0	617	363	662	902
V/C Ratio(X)	0.91	0.48	0.17	0.80	0.82	0.39	0.26	0.00	0.40	0.21	0.15	0.54
Avail Cap(c_a), veh/h	552	2430	756	256	1994	493	344	0	617	363	662	902
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	4.6	4.3	40.0	29.5	25.2	23.4	0.0	21.8	27.2	19.7	12.1
Incr Delay (d2), s/veh	14.3	0.2	0.1	9.4	2.8	0.5	1.8	0.0	1.9	1.3	0.5	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	2.1	0.5	3.6	9.4	3.7	1.9	0.0	4.9	1.7	1.7	8.0
LnGrp Delay(d),s/veh	39.2	4.8	4.4	49.4	32.3	25.7	25.2	0.0	23.7	28.5	20.2	14.4
LnGrp LOS	D	A	A	D	C	C	C		C	C	C	B
Approach Vol, veh/h		1487			1884			334			664	
Approach Delay, s/veh		12.8			32.8			24.1			16.9	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	12.3	41.7		36.0	23.3	30.7
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		22.0	13.0	43.0		22.0	28.0	28.0
Max Q Clear Time (g_c+I1), s		12.7	8.5	6.9		19.3	18.6	22.5
Green Ext Time (p_c), s		1.3	0.1	8.4		0.8	0.7	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	22.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	869	24	6	498	24	1	2	8	36	4	4
Future Vol, veh/h	6	869	24	6	498	24	1	2	8	36	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	915	25	6	524	25	1	2	8	38	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	549	0	0	940	0	0	1491	1501	928	1490	1501	537
Stage 1	-	-	-	-	-	-	940	940	-	549	549	-
Stage 2	-	-	-	-	-	-	551	561	-	941	952	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1021	-	-	729	-	-	102	122	325	102	122	544
Stage 1	-	-	-	-	-	-	316	342	-	520	516	-
Stage 2	-	-	-	-	-	-	519	510	-	316	338	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1021	-	-	729	-	-	97	120	325	97	120	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	97	120	-	97	120	-
Stage 1	-	-	-	-	-	-	314	340	-	517	512	-
Stage 2	-	-	-	-	-	-	507	506	-	304	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	22.4	61
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	111	325	1021	-	-	729	-	-	99	544
HCM Lane V/C Ratio	0.028	0.026	0.006	-	-	0.009	-	-	0.425	0.008
HCM Control Delay (s)	38.4	16.4	8.5	-	-	10	-	-	65.9	11.7
HCM Lane LOS	E	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	1.8	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	487	226	24	399	132	158	150	18	198	178	93
Future Volume (veh/h)	126	487	226	24	399	132	158	150	18	198	178	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	131	507	235	25	416	138	165	156	19	206	185	97
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	1123	502	70	481	409	206	807	97	251	988	442
Arrive On Green	0.10	0.32	0.32	0.04	0.26	0.26	0.12	0.25	0.25	0.14	0.28	0.28
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3183	382	1774	3539	1583
Grp Volume(v), veh/h	131	507	235	25	416	138	165	86	89	206	185	97
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1795	1774	1770	1583
Q Serve(g_s), s	4.6	7.4	7.7	0.9	13.7	4.6	5.8	2.5	2.5	7.3	2.6	3.0
Cycle Q Clear(g_c), s	4.6	7.4	7.7	0.9	13.7	4.6	5.8	2.5	2.5	7.3	2.6	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	174	1123	502	70	481	409	206	449	455	251	988	442
V/C Ratio(X)	0.75	0.45	0.47	0.36	0.86	0.34	0.80	0.19	0.20	0.82	0.19	0.22
Avail Cap(c_a), veh/h	220	1123	502	193	549	467	248	449	455	303	988	442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	17.5	17.6	30.2	22.8	19.4	27.8	18.9	18.9	26.9	17.7	17.8
Incr Delay (d2), s/veh	10.5	0.3	0.7	3.1	12.3	0.5	14.5	0.9	1.0	13.9	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.6	3.4	0.5	8.7	2.0	3.7	1.3	1.4	4.5	1.3	1.4
LnGrp Delay(d),s/veh	38.8	17.8	18.3	33.3	35.2	19.9	42.3	19.8	19.9	40.8	18.1	19.0
LnGrp LOS	D	B	B	C	D	B	D	B	B	D	B	B
Approach Vol, veh/h		873			579			340			488	
Approach Delay, s/veh		21.1			31.4			30.7			27.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	20.3	6.5	24.5	11.5	22.0	10.3	20.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	16.0	7.0	20.0	9.0	18.0	8.0	19.0
Max Q Clear Time (g_c+I1), s	9.3	4.5	2.9	9.7	7.8	5.0	6.6	15.7
Green Ext Time (p_c), s	0.1	0.6	0.0	2.8	0.0	1.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	26.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	13

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	146	154	0	0	97	46	277	2	24	0	0	0
Future Vol, veh/h	146	154	0	0	97	46	277	2	24	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	151	159	0	0	100	47	286	2	25	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	147	0	-	-	-	0	585	608	159
Stage 1	-	-	-	-	-	-	461	461	-
Stage 2	-	-	-	-	-	-	124	147	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	0	0	-	-	473	410	886
Stage 1	-	-	0	0	-	-	635	565	-
Stage 2	-	-	0	0	-	-	902	775	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1435	-	-	-	-	-	423	0	886
Mov Cap-2 Maneuver	-	-	-	-	-	-	423	0	-
Stage 1	-	-	-	-	-	-	568	0	-
Stage 2	-	-	-	-	-	-	902	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.8	0	28.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	423	886	1435	-	-	-
HCM Lane V/C Ratio	0.68	0.028	0.105	-	-	-
HCM Control Delay (s)	29.8	9.2	7.8	-	-	-
HCM Lane LOS	D	A	A	-	-	-
HCM 95th %tile Q(veh)	4.9	0.1	0.4	-	-	-

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	236	275	21	353	0	0	0	0	67	1	158
Future Vol, veh/h	0	236	275	21	353	0	0	0	0	67	1	158
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	241	281	21	360	0	0	0	0	68	1	161
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	11.5	16.3	11
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	99%	0%
Vol Thru, %	100%	0%	0%	100%	1%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	236	275	21	353	68	158
LT Vol	0	0	21	0	67	0
Through Vol	236	0	0	353	1	0
RT Vol	0	275	0	0	0	158
Lane Flow Rate	241	281	21	360	69	161
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.385	0.393	0.038	0.589	0.139	0.268
Departure Headway (Hd)	5.755	5.046	6.389	5.883	7.201	5.991
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	626	713	561	612	498	600
Service Time	3.487	2.778	4.123	3.617	4.941	3.73
HCM Lane V/C Ratio	0.385	0.394	0.037	0.588	0.139	0.268
HCM Control Delay	12.1	11	9.4	16.7	11.1	10.9
HCM Lane LOS	B	B	A	C	B	B
HCM 95th-tile Q	1.8	1.9	0.1	3.8	0.5	1.1

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	57	224	281	82	247
Future Vol, veh/h	211	57	224	281	82	247
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	229	62	243	305	89	268

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	291	0	1051	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	791	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1271	-	251	779
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	447	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1271	-	203	779
Mov Cap-2 Maneuver	-	-	-	-	203	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	447	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	203	779	-	-	1271	-
HCM Lane V/C Ratio	0.439	0.345	-	-	0.192	-
HCM Control Delay (s)	35.9	12	-	-	8.5	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	2.1	1.5	-	-	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	11	854	23	16	11	902	218	14	3	229	107
Future Volume (veh/h)	91	11	854	23	16	11	902	218	14	3	229	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	96	12	899	24	17	12	596	722	15	3	241	113
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	302	33	1120	109	73	36	931	955	20	4	286	246
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.53	0.53	0.53	0.16	0.16	0.16
Sat Flow, veh/h	1229	183	1583	269	398	195	1774	1818	38	23	1839	1583
Grp Volume(v), veh/h	108	0	899	53	0	0	596	0	737	244	0	113
Grp Sat Flow(s),veh/h/ln	1411	0	1583	861	0	0	1774	0	1856	1862	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.2	0.0	0.0	21.1	0.0	27.4	11.2	0.0	5.7
Cycle Q Clear(g_c), s	6.0	0.0	16.0	6.2	0.0	0.0	21.1	0.0	27.4	11.2	0.0	5.7
Prop In Lane	0.89		1.00	0.45		0.23	1.00		0.02	0.01		1.00
Lane Grp Cap(c), veh/h	335	0	1120	217	0	0	931	0	975	289	0	246
V/C Ratio(X)	0.32	0.00	0.80	0.24	0.00	0.00	0.64	0.00	0.76	0.84	0.00	0.46
Avail Cap(c_a), veh/h	335	0	1120	217	0	0	931	0	975	340	0	289
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.7	0.0	6.1	30.2	0.0	0.0	14.9	0.0	16.4	36.0	0.0	33.7
Incr Delay (d2), s/veh	0.6	0.0	4.3	0.6	0.0	0.0	3.4	0.0	5.5	15.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	22.8	1.1	0.0	0.0	11.1	0.0	15.4	7.0	0.0	2.6
LnGrp Delay(d),s/veh	32.2	0.0	10.4	30.8	0.0	0.0	18.2	0.0	21.8	51.3	0.0	35.0
LnGrp LOS	C		B	C			B		C	D		C
Approach Vol, veh/h		1007			53			1333			357	
Approach Delay, s/veh		12.7			30.8			20.2			46.2	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		17.6		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		29.4		18.0		13.2		8.2
Green Ext Time (p_c), s		6.1		0.0		0.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	21.1
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	4	46	247	2	105	45	980	26	98	958	11
Future Volume (veh/h)	18	4	46	247	2	105	45	980	26	98	958	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	4	49	263	2	112	48	1043	28	104	1019	12
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	57	236	445	413	351	118	1619	724	180	1765	21
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.46	0.46	0.10	0.49	0.49
Sat Flow, veh/h	242	257	1064	1346	1863	1583	1774	3539	1583	1774	3583	42
Grp Volume(v), veh/h	72	0	0	263	2	112	48	1043	28	104	503	528
Grp Sat Flow(s),veh/h/ln	1563	0	0	1346	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	7.6	0.0	3.2	1.4	12.4	0.5	3.1	11.0	11.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	9.6	0.0	3.2	1.4	12.4	0.5	3.1	11.0	11.0
Prop In Lane	0.26		0.68	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	429	0	0	445	413	351	118	1619	724	180	872	914
V/C Ratio(X)	0.17	0.00	0.00	0.59	0.00	0.32	0.41	0.64	0.04	0.58	0.58	0.58
Avail Cap(c_a), veh/h	536	0	0	541	545	463	227	1619	724	227	872	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	20.1	16.6	17.8	24.5	11.4	8.2	23.4	9.8	9.8
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.3	0.0	0.5	2.3	2.0	0.1	2.9	2.8	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	3.9	0.0	1.5	0.8	6.4	0.3	1.6	6.0	6.2
LnGrp Delay(d),s/veh	17.5	0.0	0.0	21.3	16.6	18.3	26.8	13.4	8.3	26.3	12.6	12.5
LnGrp LOS	B			C	B	B	C	B	A	C	B	B
Approach Vol, veh/h		72			377			1119			1135	
Approach Delay, s/veh		17.5			20.4			13.8			13.8	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	29.0		16.1	7.6	30.9		16.1
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	5.1	14.4		3.9	3.4	13.0		11.6
Green Ext Time (p_c), s	0.0	4.8		0.2	0.0	4.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	731	40	128	364	1023	143	33
Future Volume (veh/h)	191	353	37	257	181	731	40	128	364	1023	143	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	205	380	40	276	195	786	43	138	391	1100	154	35
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	512	54	301	297	1280	96	474	541	1032	1771	792
Arrive On Green	0.09	0.16	0.16	0.03	0.05	0.05	0.05	0.25	0.25	0.30	0.50	0.50
Sat Flow, veh/h	3442	3234	339	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	205	207	213	276	195	786	43	138	391	1100	154	35
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	4.6	8.9	9.0	6.4	8.2	8.5	1.9	4.8	17.3	24.0	1.8	0.6
Cycle Q Clear(g_c), s	4.6	8.9	9.0	6.4	8.2	8.5	1.9	4.8	17.3	24.0	1.8	0.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	298	280	285	301	297	1280	96	474	541	1032	1771	792
V/C Ratio(X)	0.69	0.74	0.75	0.92	0.66	0.61	0.45	0.29	0.72	1.07	0.09	0.04
Avail Cap(c_a), veh/h	301	354	361	301	373	1393	155	474	541	1032	1771	792
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00	0.77	0.77	0.77
Uniform Delay (d), s/veh	35.5	32.1	32.1	38.6	35.8	6.9	36.7	24.0	23.0	28.0	10.4	4.0
Incr Delay (d2), s/veh	6.4	6.0	6.3	26.5	2.3	0.6	3.3	1.6	8.1	44.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.8	5.0	4.2	4.4	3.4	1.0	2.7	8.7	17.6	0.9	0.3
LnGrp Delay(d),s/veh	41.9	38.1	38.5	65.0	38.1	7.4	40.0	25.6	31.2	72.0	10.5	4.1
LnGrp LOS	D	D	D	E	D	A	D	C	C	F	B	A
Approach Vol, veh/h		625			1257			572			1289	
Approach Delay, s/veh		39.5			24.8			30.5			62.8	
Approach LOS		D			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	24.3	11.0	16.7	8.3	44.0	10.9	16.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	24.0	17.0	7.0	16.0	7.0	34.0	7.0	16.0
Max Q Clear Time (g_c+I1), s	26.0	19.3	8.4	11.0	3.9	3.8	6.6	10.5
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	41.2
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1156	587	587	1324	0	0	0	0	562	0	142
Future Volume (veh/h)	0	1156	587	587	1324	0	0	0	0	562	0	142
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1180	599	599	1351	0				618	0	97
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1327	594	670	2193	0				995	0	444
Arrive On Green	0.00	0.12	0.12	0.39	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1180	599	599	1351	0				618	0	97
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	26.3	30.0	13.0	0.0	0.0				12.1	0.0	3.8
Cycle Q Clear(g_c), s	0.0	26.3	30.0	13.0	0.0	0.0				12.1	0.0	3.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1327	594	670	2193	0				995	0	444
V/C Ratio(X)	0.00	0.89	1.01	0.89	0.62	0.00				0.62	0.00	0.22
Avail Cap(c_a), veh/h	0	1327	594	731	2256	0				995	0	444
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.43	0.43	0.57	0.57	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.4	35.0	23.7	0.0	0.0				25.1	0.0	22.1
Incr Delay (d2), s/veh	0.0	3.6	26.3	8.0	0.3	0.0				2.9	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.6	17.5	6.9	0.1	0.0				6.3	0.0	1.8
LnGrp Delay(d),s/veh	0.0	37.0	61.4	31.7	0.3	0.0				28.0	0.0	23.2
LnGrp LOS		D	F	C	A					C		C
Approach Vol, veh/h		1779			1950						715	
Approach Delay, s/veh		45.2			9.9						27.4	
Approach LOS		D			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			19.6	34.0		26.4		53.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			17.0	30.0		21.0		51.0
Max Q Clear Time (g_c+I1), s			15.0	32.0		14.1		2.0
Green Ext Time (p_c), s			0.5	0.0		1.7		15.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.8
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1630	0	0	1341	378	538	0	708	0	0	0
Future Volume (veh/h)	117	1630	0	0	1341	378	538	0	708	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	119	1663	0	0	1368	386	801	0	452			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	149	2235	0	0	1554	484	1634	0	729			
Arrive On Green	0.17	0.88	0.00	0.00	0.61	0.61	0.46	0.00	0.46			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	119	1663	0	0	1368	386	801	0	452			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	5.2	9.1	0.0	0.0	18.1	14.8	12.6	0.0	17.2			
Cycle Q Clear(g_c), s	5.2	9.1	0.0	0.0	18.1	14.8	12.6	0.0	17.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	149	2235	0	0	1554	484	1634	0	729			
V/C Ratio(X)	0.80	0.74	0.00	0.00	0.88	0.80	0.49	0.00	0.62			
Avail Cap(c_a), veh/h	222	2543	0	0	1653	515	1634	0	729			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.43	0.43	0.00	0.00	0.67	0.67	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.6	3.3	0.0	0.0	14.3	13.7	15.0	0.0	16.3			
Incr Delay (d2), s/veh	5.3	0.5	0.0	0.0	3.9	5.6	1.1	0.0	3.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.7	3.8	0.0	0.0	8.7	7.0	6.4	0.0	8.3			
LnGrp Delay(d),s/veh	38.0	3.7	0.0	0.0	18.2	19.3	16.1	0.0	20.2			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		1782			1754			1253				
Approach Delay, s/veh		6.0			18.4			17.6				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		40.8		39.2			10.7	28.5
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		32.0		40.0			10.0	26.0
Max Q Clear Time (g_c+I1), s		19.2		11.1			7.2	20.1
Green Ext Time (p_c), s		4.2		14.0			0.1	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.6
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	1740	168	132	1277	74	93	106	166	58	67	348
Future Volume (veh/h)	430	1740	168	132	1277	74	93	106	166	58	67	348
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	439	1776	171	135	1303	76	95	108	169	59	68	355
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	2093	652	170	1547	382	395	225	352	324	638	964
Arrive On Green	0.53	0.82	0.82	0.10	0.24	0.24	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	960	656	1026	1098	1863	1583
Grp Volume(v), veh/h	439	1776	171	135	1303	76	95	0	277	59	68	355
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	960	0	1682	1098	1863	1583
Q Serve(g_s), s	18.3	16.4	1.9	6.0	15.5	3.1	6.0	0.0	10.4	3.6	2.0	0.0
Cycle Q Clear(g_c), s	18.3	16.4	1.9	6.0	15.5	3.1	8.0	0.0	10.4	13.9	2.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	472	2093	652	170	1547	382	395	0	576	324	638	964
V/C Ratio(X)	0.93	0.85	0.26	0.79	0.84	0.20	0.24	0.00	0.48	0.18	0.11	0.37
Avail Cap(c_a), veh/h	643	2352	732	266	1602	396	395	0	576	324	638	964
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	5.6	4.3	35.4	28.9	24.2	20.7	0.0	20.7	26.2	17.9	7.9
Incr Delay (d2), s/veh	12.5	2.0	0.1	8.5	4.2	0.3	1.4	0.0	2.9	1.2	0.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	7.3	0.8	3.3	7.2	1.4	1.7	0.0	5.2	1.2	1.1	4.1
LnGrp Delay(d),s/veh	30.6	7.6	4.5	43.9	33.1	24.4	22.1	0.0	23.5	27.4	18.3	9.0
LnGrp LOS	C	A	A	D	C	C	C		C	C	B	A
Approach Vol, veh/h		2386			1514			372			482	
Approach Delay, s/veh		11.6			33.6			23.2			12.6	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		31.4	11.7	36.9		31.4	25.3	23.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	12.0	37.0		19.0	29.0	20.0
Max Q Clear Time (g_c+I1), s		12.4	8.0	18.4		15.9	20.3	17.5
Green Ext Time (p_c), s		1.1	0.1	12.2		0.6	0.9	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	906	1	6	861	100	0	2	9	27	1	5
Future Vol, veh/h	1	906	1	6	861	100	0	2	9	27	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	996	1	7	946	110	0	2	10	30	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1056	0	0	997	0	0	2015	2069	997	2015	2014	1001
Stage 1	-	-	-	-	-	-	999	999	-	1015	1015	-
Stage 2	-	-	-	-	-	-	1016	1070	-	1000	999	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	659	-	-	694	-	-	44	54	296	44	59	295
Stage 1	-	-	-	-	-	-	293	321	-	287	316	-
Stage 2	-	-	-	-	-	-	287	298	-	293	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	659	-	-	694	-	-	42	53	296	41	58	295
Mov Cap-2 Maneuver	-	-	-	-	-	-	42	53	-	41	58	-
Stage 1	-	-	-	-	-	-	292	320	-	286	313	-
Stage 2	-	-	-	-	-	-	278	295	-	281	320	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	28.2	187.4
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	53	296	659	-	-	694	-	-	41	295
HCM Lane V/C Ratio	0.041	0.033	0.002	-	-	0.01	-	-	0.75	0.019
HCM Control Delay (s)	75.8	17.6	10.5	-	-	10.2	-	-	217.8	17.4
HCM Lane LOS	F	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	2.8	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	669	284	52	536	307	210	326	22	190	261	167
Future Volume (veh/h)	159	669	284	52	536	307	210	326	22	190	261	167
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	167	704	299	55	564	323	221	343	23	200	275	176
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	1323	592	110	601	511	245	775	52	237	799	357
Arrive On Green	0.11	0.37	0.37	0.06	0.32	0.32	0.14	0.23	0.23	0.13	0.23	0.23
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3368	225	1774	3539	1583
Grp Volume(v), veh/h	167	704	299	55	564	323	221	180	186	200	275	176
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1823	1774	1770	1583
Q Serve(g_s), s	7.4	12.4	11.6	2.4	23.5	13.8	9.8	6.9	7.0	8.8	5.2	7.7
Cycle Q Clear(g_c), s	7.4	12.4	11.6	2.4	23.5	13.8	9.8	6.9	7.0	8.8	5.2	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	200	1323	592	110	601	511	245	407	419	237	799	357
V/C Ratio(X)	0.83	0.53	0.51	0.50	0.94	0.63	0.90	0.44	0.44	0.84	0.34	0.49
Avail Cap(c_a), veh/h	200	1323	592	156	607	516	245	407	419	245	799	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	19.5	19.3	36.2	26.2	23.0	33.8	26.3	26.3	33.7	25.9	26.9
Incr Delay (d2), s/veh	25.0	0.4	0.7	3.5	22.4	2.5	33.0	3.4	3.4	22.2	1.2	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	6.1	5.2	1.3	15.8	6.4	7.0	3.8	3.9	5.7	2.7	3.8
LnGrp Delay(d),s/veh	59.6	19.9	20.0	39.7	48.6	25.4	66.9	29.7	29.7	55.9	27.1	31.7
LnGrp LOS	E	B	B	D	D	C	E	C	C	E	C	C
Approach Vol, veh/h		1170			942			587			651	
Approach Delay, s/veh		25.6			40.1			43.7			37.2	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	22.3	8.9	33.8	15.0	22.0	13.0	29.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	18.0	7.0	28.0	11.0	18.0	9.0	26.0
Max Q Clear Time (g_c+I1), s	10.8	9.0	4.4	14.4	11.8	9.7	9.4	25.5
Green Ext Time (p_c), s	0.0	1.2	0.0	4.6	0.0	1.4	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.1
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	43.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Future Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	494	0	0	244	163	260	3	156	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	407	0	-	-	-	0	1124	1205	494
Stage 1	-	-	-	-	-	-	798	798	-
Stage 2	-	-	-	-	-	-	326	407	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1152	-	0	0	-	-	~ 227	184	575
Stage 1	-	-	0	0	-	-	443	398	-
Stage 2	-	-	0	0	-	-	731	597	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1152	-	-	-	-	-	~ 197	0	575
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 197	0	-
Stage 1	-	-	-	-	-	-	385	0	-
Stage 2	-	-	-	-	-	-	731	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	148.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	197	575	1152	-	-	-
HCM Lane V/C Ratio	1.338	0.271	0.132	-	-	-
HCM Control Delay (s)	228.7	13.6	8.6	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	14.9	1.1	0.5	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	271	309	48	270	0	0	0	0	137	5	83
Future Vol, veh/h	0	271	309	48	270	0	0	0	0	137	5	83
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	330	377	59	329	0	0	0	0	167	6	101
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	15.5	16.8	13.2
HCM LOS	C	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	96%	0%
Vol Thru, %	100%	0%	0%	100%	4%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	271	309	48	270	142	83
LT Vol	0	0	48	0	137	0
Through Vol	271	0	0	270	5	0
RT Vol	0	309	0	0	0	83
Lane Flow Rate	330	377	59	329	173	101
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.557	0.561	0.112	0.586	0.365	0.179
Departure Headway (Hd)	6.069	5.358	6.912	6.403	7.585	6.382
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	592	671	517	563	473	561
Service Time	3.821	3.11	4.672	4.163	5.345	4.14
HCM Lane V/C Ratio	0.557	0.562	0.114	0.584	0.366	0.18
HCM Control Delay	16.2	14.8	10.5	17.9	14.7	10.5
HCM Lane LOS	C	B	B	C	B	B
HCM 95th-tile Q	3.4	3.5	0.4	3.8	1.7	0.6

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	423	34	126	216	24	117
Future Vol, veh/h	423	34	126	216	24	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	486	39	145	248	28	134

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	525	0	1044	506
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	538	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1042	-	254	566
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1042	-	219	566
Mov Cap-2 Maneuver	-	-	-	-	219	-
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	585	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.3	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	219	566	-	-	1042	-
HCM Lane V/C Ratio	0.126	0.238	-	-	0.139	-
HCM Control Delay (s)	23.8	13.3	-	-	9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.9	-	-	0.5	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	7	844	4	2	0	688	73	12	3	92	56
Future Volume (veh/h)	75	7	844	4	2	0	688	73	12	3	92	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	77	7	870	4	2	0	774	0	0	3	95	58
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	469	38	1099	222	92	0	1525	801	0	6	193	170
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.00	0.43	0.00	0.00	0.11	0.11	0.11
Sat Flow, veh/h	1343	143	1583	465	349	0	3548	1863	0	57	1803	1583
Grp Volume(v), veh/h	84	0	870	6	0	0	774	0	0	98	0	58
Grp Sat Flow(s),veh/h/ln	1487	0	1583	814	0	0	1774	1863	0	1860	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	9.6	0.0	0.0	3.0	0.0	2.1
Cycle Q Clear(g_c), s	2.2	0.0	16.0	2.2	0.0	0.0	9.6	0.0	0.0	3.0	0.0	2.1
Prop In Lane	0.92		1.00	0.67		0.00	1.00		0.00	0.03		1.00
Lane Grp Cap(c), veh/h	507	0	1099	314	0	0	1525	801	0	200	0	170
V/C Ratio(X)	0.17	0.00	0.79	0.02	0.00	0.00	0.51	0.00	0.00	0.49	0.00	0.34
Avail Cap(c_a), veh/h	507	0	1099	314	0	0	1525	801	0	492	0	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	5.3	16.4	0.0	0.0	12.6	0.0	0.0	25.4	0.0	25.0
Incr Delay (d2), s/veh	0.2	0.0	4.0	0.0	0.0	0.0	1.2	0.0	0.0	1.9	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	15.5	0.1	0.0	0.0	4.9	0.0	0.0	1.6	0.0	1.0
LnGrp Delay(d),s/veh	17.3	0.0	9.3	16.5	0.0	0.0	13.8	0.0	0.0	27.3	0.0	26.2
LnGrp LOS	B		A	B			B			C		C
Approach Vol, veh/h		954			6			774			156	
Approach Delay, s/veh		10.0			16.5			13.8			26.9	
Approach LOS		A			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		20.0		10.5		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		11.6		18.0		5.0		4.2
Green Ext Time (p_c), s		2.5		0.0		0.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2	15	103	3	44	44	694	23	56	819	14
Future Volume (veh/h)	2	2	15	103	3	44	44	694	23	56	819	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	2	2	16	107	3	46	46	723	24	58	853	15
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	35	173	343	249	212	119	1882	842	140	1934	34
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.07	0.53	0.53	0.08	0.54	0.54
Sat Flow, veh/h	63	259	1289	1389	1863	1583	1774	3539	1583	1774	3559	63
Grp Volume(v), veh/h	20	0	0	107	3	46	46	723	24	58	424	444
Grp Sat Flow(s),veh/h/ln	1611	0	0	1389	1863	1583	1774	1770	1583	1774	1770	1852
Q Serve(g_s), s	0.0	0.0	0.0	2.7	0.1	1.2	1.2	5.7	0.3	1.5	6.8	6.8
Cycle Q Clear(g_c), s	0.5	0.0	0.0	3.2	0.1	1.2	1.2	5.7	0.3	1.5	6.8	6.8
Prop In Lane	0.10		0.80	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	300	0	0	343	249	212	119	1882	842	140	962	1007
V/C Ratio(X)	0.07	0.00	0.00	0.31	0.01	0.22	0.39	0.38	0.03	0.41	0.44	0.44
Avail Cap(c_a), veh/h	626	0	0	630	634	539	264	1882	842	264	962	1007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	0.0	19.0	17.7	18.2	21.0	6.5	5.2	20.6	6.4	6.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	2.0	0.6	0.1	1.9	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.3	0.0	0.6	0.6	2.9	0.2	0.8	3.6	3.7
LnGrp Delay(d),s/veh	17.9	0.0	0.0	19.5	17.7	18.7	23.0	7.1	5.3	22.5	7.9	7.8
LnGrp LOS	B			B	B	B	C	A	A	C	A	A
Approach Vol, veh/h		20			156			793			926	
Approach Delay, s/veh		17.9			19.2			7.9			8.8	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	29.0		10.3	7.2	29.6		10.3
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	7.7		2.5	3.2	8.8		5.2
Green Ext Time (p_c), s	0.0	4.1		0.0	0.0	4.5		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	368	39	268	189	754	42	134	379	1104	156	36
Future Volume (veh/h)	199	368	39	268	189	754	42	134	379	1104	156	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	224	413	44	301	212	847	47	151	426	1240	175	40
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	499	53	344	296	1529	180	629	774	1343	1652	739
Arrive On Green	0.10	0.15	0.15	0.03	0.05	0.05	0.10	0.18	0.18	0.39	0.47	0.47
Sat Flow, veh/h	3442	3230	342	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	224	225	232	301	212	847	47	151	426	1240	175	40
Grp Sat Flow(s),veh/h/ln	1721	1770	1802	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	5.7	11.1	11.2	7.8	10.1	0.0	2.2	3.3	3.2	30.9	2.5	1.2
Cycle Q Clear(g_c), s	5.7	11.1	11.2	7.8	10.1	0.0	2.2	3.3	3.2	30.9	2.5	1.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	273	278	344	296	1529	180	629	774	1343	1652	739
V/C Ratio(X)	0.68	0.83	0.83	0.87	0.72	0.55	0.26	0.24	0.55	0.92	0.11	0.05
Avail Cap(c_a), veh/h	329	315	320	344	352	1613	180	629	774	1343	1652	739
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.72	1.00	1.00	1.00	0.93	0.93	0.93
Uniform Delay (d), s/veh	39.4	36.9	36.9	43.0	40.7	15.7	37.3	31.8	12.1	26.2	13.5	13.1
Incr Delay (d2), s/veh	5.6	14.6	15.2	16.3	4.0	0.3	0.8	0.9	2.8	10.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	6.6	6.8	4.5	5.5	8.0	1.1	1.7	3.0	16.5	1.2	0.6
LnGrp Delay(d),s/veh	45.0	51.4	52.1	59.3	44.7	16.0	38.1	32.7	14.9	36.4	13.6	13.3
LnGrp LOS	D	D	D	E	D	B	D	C	B	D	B	B
Approach Vol, veh/h		681			1360			624			1455	
Approach Delay, s/veh		49.5			30.0			21.0			33.0	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.1	20.0	13.0	17.9	13.1	46.0	12.6	18.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	33.0	16.0	9.0	16.0	7.0	42.0	8.0	17.0
Max Q Clear Time (g_c+I1), s	32.9	5.3	9.8	13.2	4.2	4.5	7.7	12.1
Green Ext Time (p_c), s	0.1	1.9	0.0	0.7	0.0	1.1	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	645	602	701	1423	0	0	0	0	250	6	187
Future Volume (veh/h)	0	645	602	701	1423	0	0	0	0	250	6	187
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	672	627	730	1482	0				323	0	132
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1298	581	811	2289	0				938	0	419
Arrive On Green	0.00	0.12	0.12	0.47	1.00	0.00				0.26	0.00	0.26
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	672	627	730	1482	0				323	0	132
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	16.0	33.0	17.5	0.0	0.0				6.6	0.0	6.0
Cycle Q Clear(g_c), s	0.0	16.0	33.0	17.5	0.0	0.0				6.6	0.0	6.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1298	581	811	2289	0				938	0	419
V/C Ratio(X)	0.00	0.52	1.08	0.90	0.65	0.00				0.34	0.00	0.32
Avail Cap(c_a), veh/h	0	1298	581	994	2477	0				938	0	419
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.44	0.44	0.50	0.50	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.1	39.6	22.8	0.0	0.0				26.8	0.0	26.6
Incr Delay (d2), s/veh	0.0	0.2	49.4	5.2	0.3	0.0				1.0	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.9	22.4	8.7	0.1	0.0				3.4	0.0	2.9
LnGrp Delay(d),s/veh	0.0	32.3	88.9	28.0	0.3	0.0				27.8	0.0	28.5
LnGrp LOS		C	F	C	A					C		C
Approach Vol, veh/h		1299			2212						455	
Approach Delay, s/veh		59.6			9.4						28.0	
Approach LOS		E			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			25.2	37.0		27.8		62.2
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			26.0	33.0		19.0		63.0
Max Q Clear Time (g_c+I1), s			19.5	35.0		8.6		2.0
Green Ext Time (p_c), s			1.7	0.0		1.2		18.6

Intersection Summary	
HCM 2010 Ctrl Delay	28.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	847	0	0	1598	471	570	0	587	0	0	0
Future Volume (veh/h)	64	847	0	0	1598	471	570	0	587	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	69	911	0	0	1718	506	812	0	418			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	113	2457	0	0	1906	593	1518	0	678			
Arrive On Green	0.13	0.97	0.00	0.00	0.75	0.75	0.43	0.00	0.43			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	69	911	0	0	1718	506	812	0	418			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	3.3	0.8	0.0	0.0	23.5	20.0	15.3	0.0	18.5			
Cycle Q Clear(g_c), s	3.3	0.8	0.0	0.0	23.5	20.0	15.3	0.0	18.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	113	2457	0	0	1906	593	1518	0	678			
V/C Ratio(X)	0.61	0.37	0.00	0.00	0.90	0.85	0.53	0.00	0.62			
Avail Cap(c_a), veh/h	158	2712	0	0	2034	633	1518	0	678			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.81	0.81	0.00	0.00	0.64	0.64	1.00	0.00	1.00			
Uniform Delay (d), s/veh	38.2	0.8	0.0	0.0	10.0	9.5	19.1	0.0	20.0			
Incr Delay (d2), s/veh	4.2	0.1	0.0	0.0	3.8	6.9	1.4	0.0	4.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.7	0.3	0.0	0.0	10.8	9.3	7.7	0.0	8.8			
LnGrp Delay(d),s/veh	42.4	0.9	0.0	0.0	13.8	16.5	20.4	0.0	24.2			
LnGrp LOS	D	A			B	B	C		C			
Approach Vol, veh/h		980			2224			1230				
Approach Delay, s/veh		3.8			14.4			21.7				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		42.5		47.5			9.8	37.7
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		34.0		48.0			8.0	36.0
Max Q Clear Time (g_c+I1), s		20.5		2.8			5.3	25.5
Green Ext Time (p_c), s		4.2		6.9			0.0	8.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	989	111	127	1513	179	87	138	98	75	95	472
Future Volume (veh/h)	337	989	111	127	1513	179	87	138	98	75	95	472
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	370	1087	122	140	1663	197	96	152	108	82	104	519
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	401	2194	683	173	1942	480	318	342	243	326	629	892
Arrive On Green	0.45	0.86	0.86	0.10	0.30	0.30	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	798	1015	721	1115	1863	1583
Grp Volume(v), veh/h	370	1087	122	140	1663	197	96	0	260	82	104	519
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	798	0	1736	1115	1863	1583
Q Serve(g_s), s	17.6	4.6	1.1	7.0	22.0	8.9	8.6	0.0	10.5	5.6	3.5	19.1
Cycle Q Clear(g_c), s	17.6	4.6	1.1	7.0	22.0	8.9	12.2	0.0	10.5	16.1	3.5	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	401	2194	683	173	1942	480	318	0	586	326	629	892
V/C Ratio(X)	0.92	0.50	0.18	0.81	0.86	0.41	0.30	0.00	0.44	0.25	0.17	0.58
Avail Cap(c_a), veh/h	552	2430	756	256	1994	493	318	0	586	326	629	892
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	3.8	3.6	39.8	29.5	25.0	25.2	0.0	23.2	29.5	20.9	12.7
Incr Delay (d2), s/veh	16.0	0.2	0.1	11.1	3.9	0.6	2.4	0.0	2.4	1.8	0.6	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	2.0	0.5	4.0	10.2	4.0	2.1	0.0	5.5	1.9	1.9	8.9
LnGrp Delay(d),s/veh	39.9	4.0	3.7	50.9	33.4	25.5	27.6	0.0	25.7	31.3	21.5	15.5
LnGrp LOS	D	A	A	D	C	C	C		C	C	C	B
Approach Vol, veh/h		1579			2000			356			705	
Approach Delay, s/veh		12.4			33.8			26.2			18.2	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		34.4	12.8	42.8		34.4	24.4	31.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		22.0	13.0	43.0		22.0	28.0	28.0
Max Q Clear Time (g_c+I1), s		14.2	9.0	6.6		21.1	19.6	24.0
Green Ext Time (p_c), s		1.2	0.1	9.1		0.3	0.7	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	904	25	7	518	25	2	3	9	38	5	5
Future Vol, veh/h	7	904	25	7	518	25	2	3	9	38	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	952	26	7	545	26	2	3	9	40	5	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	571	0	0	978	0	0	1554	1564	965	1553	1564	558
Stage 1	-	-	-	-	-	-	979	979	-	572	572	-
Stage 2	-	-	-	-	-	-	575	585	-	981	992	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1002	-	-	706	-	-	92	112	309	92	112	529
Stage 1	-	-	-	-	-	-	301	328	-	505	504	-
Stage 2	-	-	-	-	-	-	503	498	-	300	324	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1002	-	-	706	-	-	87	110	309	86	110	529
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	110	-	86	110	-
Stage 1	-	-	-	-	-	-	299	326	-	501	499	-
Stage 2	-	-	-	-	-	-	488	493	-	286	322	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	26.4	75.6
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	99	309	1002	-	-	706	-	-	88	529
HCM Lane V/C Ratio	0.053	0.031	0.007	-	-	0.01	-	-	0.514	0.01
HCM Control Delay (s)	43.4	17	8.6	-	-	10.2	-	-	83	11.9
HCM Lane LOS	E	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	0	-	-	2.2	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	507	236	25	415	138	165	156	19	206	186	97
Future Volume (veh/h)	132	507	236	25	415	138	165	156	19	206	186	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	138	528	246	26	432	144	172	162	20	215	194	101
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	1139	510	71	491	418	213	787	96	260	970	434
Arrive On Green	0.10	0.32	0.32	0.04	0.26	0.26	0.12	0.25	0.25	0.15	0.27	0.27
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3177	387	1774	3539	1583
Grp Volume(v), veh/h	138	528	246	26	432	144	172	89	93	215	194	101
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1794	1774	1770	1583
Q Serve(g_s), s	5.0	7.8	8.2	0.9	14.6	4.8	6.2	2.6	2.7	7.7	2.8	3.2
Cycle Q Clear(g_c), s	5.0	7.8	8.2	0.9	14.6	4.8	6.2	2.6	2.7	7.7	2.8	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	174	1139	510	71	491	418	213	438	445	260	970	434
V/C Ratio(X)	0.79	0.46	0.48	0.36	0.88	0.34	0.81	0.20	0.21	0.83	0.20	0.23
Avail Cap(c_a), veh/h	216	1139	510	189	539	458	243	438	445	297	970	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	17.7	17.9	30.7	23.2	19.6	28.2	19.6	19.6	27.2	18.3	18.5
Incr Delay (d2), s/veh	14.6	0.3	0.7	3.1	14.5	0.5	16.2	1.0	1.1	15.7	0.5	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.9	3.7	0.5	9.4	2.2	4.0	1.4	1.5	4.9	1.4	1.6
LnGrp Delay(d),s/veh	43.6	18.0	18.6	33.8	37.6	20.1	44.4	20.6	20.7	42.9	18.8	19.7
LnGrp LOS	D	B	B	C	D	C	D	C	C	D	B	B
Approach Vol, veh/h		912			602			354			510	
Approach Delay, s/veh		22.0			33.3			32.2			29.1	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	20.3	6.6	25.1	11.9	22.0	10.5	21.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	16.0	7.0	20.0	9.0	18.0	8.0	19.0
Max Q Clear Time (g_c+I1), s	9.7	4.7	2.9	10.2	8.2	5.2	7.0	16.6
Green Ext Time (p_c), s	0.1	0.6	0.0	2.9	0.0	1.1	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	27.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	15.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Future Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	159	169	0	0	106	51	303	3	27	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	157	0	-	-	-	0	619	644	169
Stage 1	-	-	-	-	-	-	487	487	-
Stage 2	-	-	-	-	-	-	132	157	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1423	-	0	0	-	-	452	391	875
Stage 1	-	-	0	0	-	-	618	550	-
Stage 2	-	-	0	0	-	-	894	768	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1423	-	-	-	-	-	401	0	875
Mov Cap-2 Maneuver	-	-	-	-	-	-	401	0	-
Stage 1	-	-	-	-	-	-	549	0	-
Stage 2	-	-	-	-	-	-	894	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.8	0	35.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	401	875	1423	-	-	-
HCM Lane V/C Ratio	0.764	0.031	0.112	-	-	-
HCM Control Delay (s)	37.7	9.2	7.8	-	-	-
HCM Lane LOS	E	A	A	-	-	-
HCM 95th %tile Q(veh)	6.3	0.1	0.4	-	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	249	292	23	375	0	0	0	0	72	2	167
Future Vol, veh/h	0	249	292	23	375	0	0	0	0	72	2	167
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	254	298	23	383	0	0	0	0	73	2	170
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	12.2	18.3	11.4
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	249	292	23	375	74	167
LT Vol	0	0	23	0	72	0
Through Vol	249	0	0	375	2	0
RT Vol	0	292	0	0	0	167
Lane Flow Rate	254	298	23	383	76	170
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.414	0.427	0.042	0.638	0.154	0.29
Departure Headway (Hd)	5.866	5.156	6.506	5.999	7.328	6.123
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	612	697	550	601	489	586
Service Time	3.605	2.895	4.248	3.741	5.076	3.87
HCM Lane V/C Ratio	0.415	0.428	0.042	0.637	0.155	0.29
HCM Control Delay	12.7	11.7	9.5	18.8	11.4	11.4
HCM Lane LOS	B	B	A	C	B	B
HCM 95th-tile Q	2	2.1	0.1	4.5	0.5	1.2

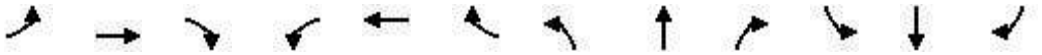
Intersection	
Int Delay, s/veh	7.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	224	61	237	298	87	261
Future Vol, veh/h	224	61	237	298	87	261
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	243	66	258	324	95	284

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	309	0	1116	276
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	840	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1252	-	230	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	424	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1252	-	183	763
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	424	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	183	763	-	-	1252	-
HCM Lane V/C Ratio	0.517	0.372	-	-	0.206	-
HCM Control Delay (s)	44	12.5	-	-	8.6	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	2.6	1.7	-	-	0.8	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	12	906	25	17	12	955	231	15	4	241	114
Future Volume (veh/h)	96	12	906	25	17	12	955	231	15	4	241	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	101	13	954	26	18	13	632	765	16	4	254	120
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	290	33	1112	102	66	32	924	947	20	5	296	256
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.52	0.52	0.52	0.16	0.16	0.16
Sat Flow, veh/h	1176	181	1583	233	366	177	1774	1818	38	29	1832	1583
Grp Volume(v), veh/h	114	0	954	57	0	0	632	0	781	258	0	120
Grp Sat Flow(s),veh/h/ln	1357	0	1583	775	0	0	1774	0	1856	1861	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.3	0.0	0.0	23.4	0.0	30.7	11.9	0.0	6.1
Cycle Q Clear(g_c), s	7.0	0.0	16.0	7.3	0.0	0.0	23.4	0.0	30.7	11.9	0.0	6.1
Prop In Lane	0.89		1.00	0.46		0.23	1.00		0.02	0.02		1.00
Lane Grp Cap(c), veh/h	323	0	1112	200	0	0	924	0	967	301	0	256
V/C Ratio(X)	0.35	0.00	0.86	0.29	0.00	0.00	0.68	0.00	0.81	0.86	0.00	0.47
Avail Cap(c_a), veh/h	323	0	1112	200	0	0	924	0	967	337	0	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	6.3	30.7	0.0	0.0	15.7	0.0	17.5	36.0	0.0	33.6
Incr Delay (d2), s/veh	0.7	0.0	6.9	0.8	0.0	0.0	4.1	0.0	7.2	17.7	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	25.2	1.2	0.0	0.0	12.5	0.0	17.6	7.6	0.0	2.7
LnGrp Delay(d),s/veh	33.1	0.0	13.2	31.5	0.0	0.0	19.8	0.0	24.7	53.7	0.0	34.9
LnGrp LOS	C		B	C			B		C	D		C
Approach Vol, veh/h		1068			57			1413			378	
Approach Delay, s/veh		15.3			31.5			22.5			47.7	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		18.3		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		32.7		18.0		13.9		9.3
Green Ext Time (p_c), s		5.9		0.0		0.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	49	262	3	112	48	1037	27	104	1014	12
Future Volume (veh/h)	20	5	49	262	3	112	48	1037	27	104	1014	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	21	5	52	279	3	119	51	1103	29	111	1079	13
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	141	61	241	456	431	367	122	1591	712	183	1734	21
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.45	0.45	0.10	0.48	0.48
Sat Flow, veh/h	255	264	1039	1341	1863	1583	1774	3539	1583	1774	3582	43
Grp Volume(v), veh/h	78	0	0	279	3	119	51	1103	29	111	533	559
Grp Sat Flow(s),veh/h/ln	1558	0	0	1341	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	8.3	0.1	3.5	1.5	13.9	0.6	3.3	12.4	12.4
Cycle Q Clear(g_c), s	2.1	0.0	0.0	10.4	0.1	3.5	1.5	13.9	0.6	3.3	12.4	12.4
Prop In Lane	0.27		0.67	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	443	0	0	456	431	367	122	1591	712	183	857	898
V/C Ratio(X)	0.18	0.00	0.00	0.61	0.01	0.32	0.42	0.69	0.04	0.61	0.62	0.62
Avail Cap(c_a), veh/h	527	0	0	532	536	456	223	1591	712	223	857	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	0.0	20.2	16.4	17.8	24.8	12.2	8.6	23.9	10.6	10.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.6	0.0	0.5	2.3	2.5	0.1	3.2	3.4	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	4.2	0.0	1.6	0.8	7.3	0.3	1.8	6.7	7.0
LnGrp Delay(d),s/veh	17.4	0.0	0.0	21.7	16.5	18.3	27.1	14.8	8.7	27.1	14.0	13.8
LnGrp LOS	B			C	B	B	C	B	A	C	B	B
Approach Vol, veh/h		78			401			1183			1203	
Approach Delay, s/veh		17.4			20.7			15.1			15.1	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	29.0		16.9	7.8	30.9		16.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	5.3	15.9		4.1	3.5	14.4		12.4
Green Ext Time (p_c), s	0.0	4.6		0.3	0.0	4.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	368	39	268	189	759	42	134	379	1063	149	35
Future Volume (veh/h)	199	368	39	268	189	759	42	134	379	1063	149	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	214	396	42	288	203	816	45	144	408	1143	160	38
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	299	516	54	301	299	1318	98	850	913	1076	1760	788
Arrive On Green	0.09	0.16	0.16	0.03	0.05	0.05	0.06	0.24	0.24	0.31	0.50	0.50
Sat Flow, veh/h	3442	3231	341	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	214	216	222	288	203	816	45	144	408	1143	160	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	4.8	9.3	9.4	6.7	8.6	8.5	2.0	2.6	9.2	25.0	1.9	0.6
Cycle Q Clear(g_c), s	4.8	9.3	9.4	6.7	8.6	8.5	2.0	2.6	9.2	25.0	1.9	0.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	299	283	288	301	299	1318	98	850	913	1076	1760	788
V/C Ratio(X)	0.72	0.76	0.77	0.96	0.68	0.62	0.46	0.17	0.45	1.06	0.09	0.05
Avail Cap(c_a), veh/h	301	354	361	301	373	1428	155	850	913	1076	1760	788
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	0.72	0.72	0.72
Uniform Delay (d), s/veh	35.6	32.2	32.2	38.7	35.9	6.4	36.6	24.1	21.2	27.5	10.6	4.1
Incr Delay (d2), s/veh	7.9	7.5	7.8	34.0	2.7	0.6	3.3	0.4	1.6	42.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.1	5.3	4.6	4.6	3.4	1.1	1.3	3.8	18.1	1.0	0.3
LnGrp Delay(d),s/veh	43.4	39.6	40.0	72.7	38.6	7.0	39.9	24.5	22.8	69.5	10.7	4.2
LnGrp LOS	D	D	D	E	D	A	D	C	C	F	B	A
Approach Vol, veh/h		652			1307			597			1341	
Approach Delay, s/veh		41.0			26.4			24.5			60.7	
Approach LOS		D			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.0	23.2	11.0	16.8	8.4	43.8	10.9	16.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	25.0	16.0	7.0	16.0	7.0	34.0	7.0	16.0
Max Q Clear Time (g_c+I1), s	27.0	11.2	8.7	11.4	4.0	3.9	6.8	10.6
Green Ext Time (p_c), s	0.0	1.1	0.0	1.0	0.0	1.0	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	40.3
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1225	621	623	1402	0	0	0	0	596	0	151
Future Volume (veh/h)	0	1225	621	623	1402	0	0	0	0	596	0	151
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1250	634	636	1431	0				656	0	103
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1327	594	699	2223	0				965	0	430
Arrive On Green	0.00	0.12	0.12	0.41	1.00	0.00				0.27	0.00	0.27
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1250	634	636	1431	0				656	0	103
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	28.0	30.0	13.9	0.0	0.0				13.2	0.0	4.1
Cycle Q Clear(g_c), s	0.0	28.0	30.0	13.9	0.0	0.0				13.2	0.0	4.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1327	594	699	2223	0				965	0	430
V/C Ratio(X)	0.00	0.94	1.07	0.91	0.64	0.00				0.68	0.00	0.24
Avail Cap(c_a), veh/h	0	1327	594	731	2256	0				965	0	430
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.48	0.48	0.51	0.51	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	34.2	35.0	23.1	0.0	0.0				26.0	0.0	22.7
Incr Delay (d2), s/veh	0.0	7.5	45.9	8.7	0.3	0.0				3.9	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.1	20.7	7.4	0.1	0.0				7.0	0.0	1.9
LnGrp Delay(d),s/veh	0.0	41.7	80.9	31.8	0.3	0.0				29.9	0.0	24.0
LnGrp LOS		D	F	C	A					C		C
Approach Vol, veh/h		1884			2067						759	
Approach Delay, s/veh		54.9			10.0						29.1	
Approach LOS		D			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			20.3	34.0		25.7		54.3
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			17.0	30.0		21.0		51.0
Max Q Clear Time (g_c+I1), s			15.9	32.0		15.2		2.0
Green Ext Time (p_c), s			0.3	0.0		1.6		16.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	1728	0	0	1421	401	569	0	751	0	0	0
Future Volume (veh/h)	125	1728	0	0	1421	401	569	0	751	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	128	1763	0	0	1450	409	848	0	480			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	159	2306	0	0	1597	497	1584	0	707			
Arrive On Green	0.18	0.91	0.00	0.00	0.63	0.63	0.45	0.00	0.45			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	128	1763	0	0	1450	409	848	0	480			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	5.5	8.4	0.0	0.0	19.7	15.9	13.9	0.0	19.3			
Cycle Q Clear(g_c), s	5.5	8.4	0.0	0.0	19.7	15.9	13.9	0.0	19.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	159	2306	0	0	1597	497	1584	0	707			
V/C Ratio(X)	0.81	0.76	0.00	0.00	0.91	0.82	0.54	0.00	0.68			
Avail Cap(c_a), veh/h	222	2543	0	0	1653	515	1584	0	707			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.33	0.33	0.00	0.00	0.61	0.61	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.2	2.4	0.0	0.0	13.9	13.2	16.1	0.0	17.6			
Incr Delay (d2), s/veh	4.9	0.4	0.0	0.0	4.9	6.4	1.3	0.0	5.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.9	3.0	0.0	0.0	9.6	7.5	7.0	0.0	9.4			
LnGrp Delay(d),s/veh	37.1	2.9	0.0	0.0	18.8	19.6	17.4	0.0	22.8			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		1891			1859			1328				
Approach Delay, s/veh		5.2			19.0			19.3				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		39.7		40.3			11.2	29.1
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		32.0		40.0			10.0	26.0
Max Q Clear Time (g_c+I1), s		21.3		10.4			7.5	21.7
Green Ext Time (p_c), s		4.1		15.3			0.1	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	456	1844	179	140	1353	79	99	113	176	62	72	369
Future Volume (veh/h)	456	1844	179	140	1353	79	99	113	176	62	72	369
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	465	1882	183	143	1381	81	101	115	180	63	73	377
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	496	2160	673	179	1576	389	368	213	333	285	604	956
Arrive On Green	0.56	0.85	0.85	0.10	0.25	0.25	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	937	656	1026	1080	1863	1583
Grp Volume(v), veh/h	465	1882	183	143	1381	81	101	0	295	63	73	377
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	937	0	1682	1080	1863	1583
Q Serve(g_s), s	19.4	17.1	1.8	6.3	16.6	3.3	6.8	0.0	11.5	4.1	2.2	0.0
Cycle Q Clear(g_c), s	19.4	17.1	1.8	6.3	16.6	3.3	9.0	0.0	11.5	15.6	2.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	496	2160	673	179	1576	389	368	0	546	285	604	956
V/C Ratio(X)	0.94	0.87	0.27	0.80	0.88	0.21	0.27	0.00	0.54	0.22	0.12	0.39
Avail Cap(c_a), veh/h	643	2352	732	266	1602	396	368	0	546	285	604	956
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	4.8	3.6	35.2	29.0	24.0	22.2	0.0	22.1	28.5	19.0	8.2
Incr Delay (d2), s/veh	13.4	2.4	0.1	9.9	5.7	0.3	1.8	0.0	3.8	1.8	0.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.1	7.4	0.7	3.6	7.9	1.4	1.9	0.0	5.9	1.3	1.2	4.6
LnGrp Delay(d),s/veh	30.4	7.1	3.7	45.1	34.7	24.2	24.0	0.0	26.0	30.3	19.4	9.5
LnGrp LOS	C	A	A	D	C	C	C		C	C	B	A
Approach Vol, veh/h		2530			1605			396			513	
Approach Delay, s/veh		11.2			35.1			25.5			13.4	
Approach LOS		B			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.0	12.1	38.0		30.0	26.4	23.7
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	12.0	37.0		19.0	29.0	20.0
Max Q Clear Time (g_c+I1), s		13.5	8.3	19.1		17.6	21.4	18.6
Green Ext Time (p_c), s		1.1	0.1	12.5		0.3	0.9	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	942	2	7	895	104	0	3	10	29	2	6
Future Vol, veh/h	2	942	2	7	895	104	0	3	10	29	2	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1035	2	8	984	114	0	3	11	32	2	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1098	0	0	1037	0	0	2098	2154	1036	2099	2098	1041
Stage 1	-	-	-	-	-	-	1040	1040	-	1057	1057	-
Stage 2	-	-	-	-	-	-	1058	1114	-	1042	1041	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	636	-	-	670	-	-	38	48	281	38	52	279
Stage 1	-	-	-	-	-	-	278	307	-	272	302	-
Stage 2	-	-	-	-	-	-	272	284	-	277	307	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	636	-	-	670	-	-	35	47	281	34	51	279
Mov Cap-2 Maneuver	-	-	-	-	-	-	35	47	-	34	51	-
Stage 1	-	-	-	-	-	-	277	306	-	271	298	-
Stage 2	-	-	-	-	-	-	260	281	-	262	306	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	34.2	266.2
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	47	281	636	-	-	670	-	-	35	279
HCM Lane V/C Ratio	0.07	0.039	0.003	-	-	0.011	-	-	0.973	0.024
HCM Control Delay (s)	87.3	18.3	10.7	-	-	10.4	-	-	$ 314.2	18.2
HCM Lane LOS	F	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	0	-	-	3.5	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	696	296	54	558	320	219	340	23	198	272	174
Future Volume (veh/h)	166	696	296	54	558	320	219	340	23	198	272	174
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	175	733	312	57	587	337	231	358	24	208	286	183
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	1326	593	111	605	515	244	758	51	244	796	356
Arrive On Green	0.11	0.37	0.37	0.06	0.32	0.32	0.14	0.22	0.22	0.14	0.22	0.22
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3368	225	1774	3539	1583
Grp Volume(v), veh/h	175	733	312	57	587	337	231	187	195	208	286	183
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1823	1774	1770	1583
Q Serve(g_s), s	7.8	13.1	12.3	2.5	24.8	14.6	10.3	7.3	7.4	9.2	5.5	8.1
Cycle Q Clear(g_c), s	7.8	13.1	12.3	2.5	24.8	14.6	10.3	7.3	7.4	9.2	5.5	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	200	1326	593	111	605	515	244	398	410	244	796	356
V/C Ratio(X)	0.88	0.55	0.53	0.51	0.97	0.65	0.95	0.47	0.47	0.85	0.36	0.51
Avail Cap(c_a), veh/h	200	1326	593	155	605	515	244	398	410	244	796	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	19.7	19.5	36.3	26.6	23.2	34.2	26.9	26.9	33.7	26.1	27.2
Incr Delay (d2), s/veh	32.6	0.5	0.9	3.6	29.0	3.0	43.1	4.0	3.9	24.1	1.3	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	6.4	5.5	1.3	17.6	6.8	8.0	4.0	4.2	6.1	2.8	4.0
LnGrp Delay(d),s/veh	67.6	20.2	20.3	39.9	55.6	26.1	77.3	30.8	30.8	57.8	27.4	32.4
LnGrp LOS	E	C	C	D	E	C	E	C	C	E	C	C
Approach Vol, veh/h		1220			981			613			677	
Approach Delay, s/veh		27.0			44.6			48.3			38.1	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	22.0	9.0	34.0	15.0	22.0	13.0	30.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	18.0	7.0	28.0	11.0	18.0	9.0	26.0
Max Q Clear Time (g_c+I1), s	11.2	9.4	4.5	15.1	12.3	10.1	9.8	26.8
Green Ext Time (p_c), s	0.0	1.3	0.0	4.7	0.0	1.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	112.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	113	318	0	0	156	105	216	2	99	0	0	0
Future Vol, veh/h	113	318	0	0	156	105	216	2	99	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	179	505	0	0	248	167	343	3	157	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	415	0	-	-	-	0	1195	1278	505
Stage 1	-	-	-	-	-	-	863	863	-
Stage 2	-	-	-	-	-	-	332	415	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1144	-	0	0	-	-	~ 206	166	567
Stage 1	-	-	0	0	-	-	413	372	-
Stage 2	-	-	0	0	-	-	727	592	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1144	-	-	-	-	-	~ 174	0	567
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 174	0	-
Stage 1	-	-	-	-	-	-	349	0	-
Stage 2	-	-	-	-	-	-	727	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.3	0	$ 354.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	174	567	1144	-	-	-
HCM Lane V/C Ratio	1.989	0.277	0.157	-	-	-
HCM Control Delay (s)	$ 508.9	13.8	8.7	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	26.4	1.1	0.6	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	20.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	294	339	50	322	0	0	0	0	139	5	151
Future Vol, veh/h	0	294	339	50	322	0	0	0	0	139	5	151
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	359	413	61	393	0	0	0	0	170	6	184
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	20	25.2	14.3
HCM LOS	C	D	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	294	339	50	322	144	151
LT Vol	0	0	50	0	139	0
Through Vol	294	0	0	322	5	0
RT Vol	0	339	0	0	0	151
Lane Flow Rate	359	413	61	393	176	184
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.648	0.666	0.125	0.747	0.387	0.344
Departure Headway (Hd)	6.51	5.796	7.355	6.844	7.925	6.717
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	552	620	484	526	453	532
Service Time	4.293	3.578	5.147	4.635	5.707	4.497
HCM Lane V/C Ratio	0.65	0.666	0.126	0.747	0.389	0.346
HCM Control Delay	20.6	19.5	11.2	27.4	15.7	13
HCM Lane LOS	C	C	B	D	C	B
HCM 95th-tile Q	4.6	5	0.4	6.4	1.8	1.5

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	466	44	154	315	31	149
Future Vol, veh/h	466	44	154	315	31	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	536	51	177	362	36	171

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	587	0	1278	562
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	716	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	988	-	183	526
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	988	-	150	526
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	18.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	150	526	-	-	988	-
HCM Lane V/C Ratio	0.238	0.326	-	-	0.179	-
HCM Control Delay (s)	36.3	15.1	-	-	9.4	-
HCM Lane LOS	E	C	-	-	A	-
HCM 95th %tile Q(veh)	0.9	1.4	-	-	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	7	1112	4	2	0	965	92	12	3	111	74
Future Volume (veh/h)	95	7	1112	4	2	0	965	92	12	3	111	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	98	7	1146	4	2	0	1074	0	0	3	114	76
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	362	23	1207	136	54	0	2007	1053	0	4	164	143
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.00	0.57	0.00	0.00	0.09	0.09	0.09
Sat Flow, veh/h	1403	117	1583	319	276	0	3548	1863	0	48	1813	1583
Grp Volume(v), veh/h	105	0	1146	6	0	0	1074	0	0	117	0	76
Grp Sat Flow(s),veh/h/ln	1520	0	1583	595	0	0	1774	1863	0	1860	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	15.3	0.0	0.0	5.0	0.0	3.7
Cycle Q Clear(g_c), s	4.1	0.0	16.0	4.2	0.0	0.0	15.3	0.0	0.0	5.0	0.0	3.7
Prop In Lane	0.93		1.00	0.67		0.00	1.00		0.00	0.03		1.00
Lane Grp Cap(c), veh/h	384	0	1207	191	0	0	2007	1053	0	168	0	143
V/C Ratio(X)	0.27	0.00	0.95	0.03	0.00	0.00	0.54	0.00	0.00	0.70	0.00	0.53
Avail Cap(c_a), veh/h	384	0	1207	191	0	0	2007	1053	0	366	0	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	4.2	26.4	0.0	0.0	11.0	0.0	0.0	35.9	0.0	35.4
Incr Delay (d2), s/veh	0.4	0.0	15.4	0.1	0.0	0.0	1.0	0.0	0.0	5.1	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	30.6	0.1	0.0	0.0	7.7	0.0	0.0	2.8	0.0	1.7
LnGrp Delay(d),s/veh	28.3	0.0	19.6	26.5	0.0	0.0	12.0	0.0	0.0	41.1	0.0	38.4
LnGrp LOS	C		B	C			B			D		D
Approach Vol, veh/h		1251			6			1074			193	
Approach Delay, s/veh		20.3			26.5			12.0			40.0	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		11.3		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		17.3		18.0		7.0		6.2
Green Ext Time (p_c), s		4.4		0.0		0.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.3
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2	28	116	3	44	53	990	32	56	1106	14
Future Volume (veh/h)	2	2	28	116	3	44	53	990	32	56	1106	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	2	2	29	121	3	46	55	1031	33	58	1152	15
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	22	194	349	257	218	135	1873	838	140	1903	25
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.08	0.53	0.53	0.08	0.53	0.53
Sat Flow, veh/h	37	157	1406	1373	1863	1583	1774	3539	1583	1774	3578	47
Grp Volume(v), veh/h	33	0	0	121	3	46	55	1031	33	58	570	597
Grp Sat Flow(s),veh/h/ln	1600	0	0	1373	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	2.8	0.1	1.2	1.4	9.1	0.5	1.5	10.5	10.5
Cycle Q Clear(g_c), s	0.9	0.0	0.0	3.7	0.1	1.2	1.4	9.1	0.5	1.5	10.5	10.5
Prop In Lane	0.06		0.88	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	301	0	0	349	257	218	135	1873	838	140	941	987
V/C Ratio(X)	0.11	0.00	0.00	0.35	0.01	0.21	0.41	0.55	0.04	0.41	0.61	0.61
Avail Cap(c_a), veh/h	619	0	0	625	631	536	263	1873	838	263	941	987
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	0.0	19.1	17.6	18.1	20.8	7.4	5.3	20.7	7.6	7.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.6	0.0	0.5	2.0	1.2	0.1	1.9	2.9	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.5	0.0	0.6	0.8	4.7	0.2	0.8	5.8	6.1
LnGrp Delay(d),s/veh	18.1	0.0	0.0	19.6	17.6	18.6	22.8	8.6	5.4	22.7	10.5	10.4
LnGrp LOS	B			B	B	B	C	A	A	C	B	B
Approach Vol, veh/h		33			170			1119			1225	
Approach Delay, s/veh		18.1			19.3			9.2			11.0	
Approach LOS		B			B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	29.0		10.5	7.6	29.1		10.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	11.1		2.9	3.4	12.5		5.7
Green Ext Time (p_c), s	0.0	5.6		0.1	0.0	5.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Future Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	224	433	45	811	229	1118	47	222	526	1516	248	40
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	540	432	45	688	329	1583	82	501	952	1348	1724	771
Arrive On Green	0.16	0.13	0.13	0.07	0.06	0.06	0.05	0.14	0.14	0.39	0.49	0.49
Sat Flow, veh/h	3442	3238	335	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	224	236	242	811	229	1118	47	222	526	1516	248	40
Grp Sat Flow(s),veh/h/ln	1721	1770	1804	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	7.0	16.0	16.0	24.0	14.5	11.1	3.1	6.9	11.9	47.0	4.6	0.9
Cycle Q Clear(g_c), s	7.0	16.0	16.0	24.0	14.5	11.1	3.1	6.9	11.9	47.0	4.6	0.9
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	540	236	240	688	329	1583	82	501	952	1348	1724	771
V/C Ratio(X)	0.41	1.00	1.01	1.18	0.70	0.71	0.57	0.44	0.55	1.12	0.14	0.05
Avail Cap(c_a), veh/h	540	236	240	688	419	1718	118	501	952	1348	1724	771
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	45.6	52.0	52.0	56.0	53.4	7.8	56.1	47.2	15.4	36.5	17.0	5.1
Incr Delay (d2), s/veh	0.5	58.3	59.9	87.7	1.7	0.6	6.2	2.8	2.3	64.7	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	11.6	12.0	19.8	7.6	7.2	1.7	3.6	4.8	34.4	2.3	0.4
LnGrp Delay(d),s/veh	46.1	110.3	112.0	143.8	55.1	8.4	62.3	50.0	17.7	101.2	17.1	5.3
LnGrp LOS	D	F	F	F	E	A	E	D	B	F	B	A
Approach Vol, veh/h		702			2158			795			1804	
Approach Delay, s/veh		90.4			64.2			29.4			87.5	
Approach LOS		F			E			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	51.0	21.0	28.0	20.0	9.5	62.5	22.8	25.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	47.0	17.0	24.0	16.0	8.0	56.0	13.0	27.0
Max Q Clear Time (g_c+I1), s	49.0	13.9	26.0	18.0	5.1	6.6	9.0	16.5
Green Ext Time (p_c), s	0.0	1.1	0.0	0.0	0.0	1.7	0.3	4.7

Intersection Summary	
HCM 2010 Ctrl Delay	70.2
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	944	691	904	1958	0	0	0	0	397	6	326
Future Volume (veh/h)	0	944	691	904	1958	0	0	0	0	397	6	326
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	983	720	942	2040	0				522	0	229
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1268	567	993	2408	0				898	0	401
Arrive On Green	0.00	0.12	0.12	0.58	1.00	0.00				0.25	0.00	0.25
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	983	720	942	2040	0				522	0	229
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	32.4	43.0	30.7	0.0	0.0				15.5	0.0	15.2
Cycle Q Clear(g_c), s	0.0	32.4	43.0	30.7	0.0	0.0				15.5	0.0	15.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1268	567	993	2408	0				898	0	401
V/C Ratio(X)	0.00	0.78	1.27	0.95	0.85	0.00				0.58	0.00	0.57
Avail Cap(c_a), veh/h	0	1268	567	1090	2507	0				898	0	401
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.14	0.14	0.15	0.15	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	48.2	52.9	24.5	0.0	0.0				39.3	0.0	39.1
Incr Delay (d2), s/veh	0.0	0.4	123.1	3.4	0.4	0.0				2.7	0.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.0	38.3	14.6	0.1	0.0				8.0	0.0	7.3
LnGrp Delay(d),s/veh	0.0	48.6	176.0	27.9	0.4	0.0				42.0	0.0	45.0
LnGrp LOS		D	F	C	A					D		D
Approach Vol, veh/h		1703			2982						751	
Approach Delay, s/veh		102.5			9.1						42.9	
Approach LOS		F			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			38.6	47.0		34.4		85.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			38.0	43.0		27.0		85.0
Max Q Clear Time (g_c+I1), s			32.7	45.0		17.5		2.0
Green Ext Time (p_c), s			2.0	0.0		2.1		39.3

Intersection Summary	
HCM 2010 Ctrl Delay	43.0
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	1239	0	0	2169	664	737	0	748	0	0	0
Future Volume (veh/h)	118	1239	0	0	2169	664	737	0	748	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	127	1332	0	0	2332	714	1044	0	534			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	148	2952	0	0	2359	734	1252	0	559			
Arrive On Green	0.17	1.00	0.00	0.00	0.93	0.93	0.35	0.00	0.35			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	127	1332	0	0	2332	714	1044	0	534			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	8.4	0.0	0.0	0.0	48.0	39.8	32.4	0.0	39.5			
Cycle Q Clear(g_c), s	8.4	0.0	0.0	0.0	48.0	39.8	32.4	0.0	39.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	148	2952	0	0	2359	734	1252	0	559			
V/C Ratio(X)	0.86	0.45	0.00	0.00	0.99	0.97	0.83	0.00	0.96			
Avail Cap(c_a), veh/h	148	2966	0	0	2373	739	1252	0	559			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.56	0.56	0.00	0.00	0.26	0.26	1.00	0.00	1.00			
Uniform Delay (d), s/veh	49.3	0.0	0.0	0.0	4.1	3.8	35.6	0.0	37.9			
Incr Delay (d2), s/veh	23.6	0.1	0.0	0.0	7.0	11.2	6.6	0.0	28.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.1	0.0	0.0	0.0	19.2	16.1	17.0	0.0	21.6			
LnGrp Delay(d),s/veh	72.9	0.1	0.0	0.0	11.1	14.9	42.3	0.0	66.6			
LnGrp LOS	E	A			B	B	D		E			
Approach Vol, veh/h		1459			3046			1578				
Approach Delay, s/veh		6.4			12.0			50.5				
Approach LOS		A			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		46.3		73.7			14.0	59.7
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		42.0		70.0			10.0	56.0
Max Q Clear Time (g_c+I1), s		41.5		2.0			10.4	50.0
Green Ext Time (p_c), s		0.3		12.4			0.0	5.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Future Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	378	1516	295	199	2146	211	442	155	224	101	108	529
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	1690	526	371	2136	528	311	247	357	232	667	897
Arrive On Green	0.42	0.66	0.66	0.21	0.33	0.33	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	788	690	997	1000	1863	1583
Grp Volume(v), veh/h	378	1516	295	199	2146	211	442	0	379	101	108	529
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	788	0	1687	1000	1863	1583
Q Serve(g_s), s	25.0	29.7	11.9	12.0	40.0	12.3	38.3	0.0	22.3	11.2	4.7	1.1
Cycle Q Clear(g_c), s	25.0	29.7	11.9	12.0	40.0	12.3	43.0	0.0	22.3	33.5	4.7	1.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	370	1690	526	371	2136	528	311	0	604	232	667	897
V/C Ratio(X)	1.02	0.90	0.56	0.54	1.00	0.40	1.42	0.00	0.63	0.43	0.16	0.59
Avail Cap(c_a), veh/h	370	1865	581	371	2136	528	311	0	604	232	667	897
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	18.4	15.4	42.3	40.0	30.8	44.6	0.0	31.9	45.7	26.2	16.9
Incr Delay (d2), s/veh	47.6	4.7	0.8	1.5	20.6	0.5	207.0	0.0	4.9	5.8	0.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.0	14.2	5.2	6.0	20.7	5.5	28.2	0.0	11.2	3.5	2.5	1.0
LnGrp Delay(d),s/veh	82.6	23.1	16.2	43.8	60.6	31.3	251.5	0.0	36.7	51.5	26.7	19.8
LnGrp LOS	F	C	B	D	F	C	F		D	D	C	B
Approach Vol, veh/h		2189			2556			821			738	
Approach Delay, s/veh		32.5			56.9			152.4			25.1	
Approach LOS		C			E			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		47.0	29.1	43.9		47.0	29.0	44.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		43.0	21.0	44.0		43.0	25.0	40.0
Max Q Clear Time (g_c+I1), s		45.0	14.0	31.7		35.5	27.0	42.0
Green Ext Time (p_c), s		0.0	0.3	8.2		1.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	57.1
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	15.5

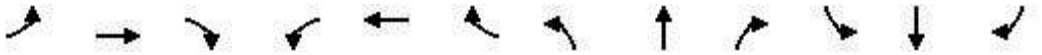
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	1187	25	7	794	32	2	3	9	47	5	5
Future Vol, veh/h	7	1187	25	7	794	32	2	3	9	47	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1249	26	7	836	34	2	3	9	49	5	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	870	0	0	1275	0	0	2146	2160	1262	2145	2156	853
Stage 1	-	-	-	-	-	-	1276	1276	-	867	867	-
Stage 2	-	-	-	-	-	-	870	884	-	1278	1289	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	775	-	-	545	-	-	35	47	207	~ 35	48	359
Stage 1	-	-	-	-	-	-	205	238	-	348	370	-
Stage 2	-	-	-	-	-	-	346	363	-	204	234	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	775	-	-	545	-	-	31	46	207	~ 31	47	359
Mov Cap-2 Maneuver	-	-	-	-	-	-	31	46	-	~ 31	47	-
Stage 1	-	-	-	-	-	-	203	236	-	345	365	-
Stage 2	-	-	-	-	-	-	332	358	-	190	232	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	54.6	$ 559.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	39	207	775	-	-	545	-	-	32	359
HCM Lane V/C Ratio	0.135	0.046	0.01	-	-	0.014	-	-	1.711	0.015
HCM Control Delay (s)	111.2	23.2	9.7	-	-	11.7	-	-	$ 612.3	15.2
HCM Lane LOS	F	C	A	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.4	0.1	0	-	-	0	-	-	6.2	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	647	236	96	550	208	165	157	90	278	189	97
Future Volume (veh/h)	132	647	236	96	550	208	165	157	90	278	189	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	138	674	246	100	573	217	172	164	94	290	197	101
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	1248	558	130	622	529	209	458	249	326	963	431
Arrive On Green	0.09	0.35	0.35	0.07	0.33	0.33	0.12	0.21	0.21	0.18	0.27	0.27
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	2213	1206	1774	3539	1583
Grp Volume(v), veh/h	138	674	246	100	573	217	172	129	129	290	197	101
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1650	1774	1770	1583
Q Serve(g_s), s	6.7	13.3	10.4	4.8	25.8	9.2	8.2	5.4	5.8	13.9	3.7	4.3
Cycle Q Clear(g_c), s	6.7	13.3	10.4	4.8	25.8	9.2	8.2	5.4	5.8	13.9	3.7	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.73	1.00		1.00
Lane Grp Cap(c), veh/h	163	1248	558	130	622	529	209	366	341	326	963	431
V/C Ratio(X)	0.85	0.54	0.44	0.77	0.92	0.41	0.82	0.35	0.38	0.89	0.20	0.23
Avail Cap(c_a), veh/h	163	1248	558	224	663	564	326	366	341	346	963	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	22.5	21.6	39.6	27.9	22.4	37.5	29.6	29.7	34.7	24.4	24.6
Incr Delay (d2), s/veh	31.7	0.5	0.5	9.2	17.7	0.5	9.2	2.7	3.2	22.9	0.5	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	6.5	4.6	2.7	16.3	4.1	4.5	2.9	2.9	8.8	1.9	2.0
LnGrp Delay(d),s/veh	70.6	23.0	22.1	48.8	45.6	22.9	46.7	32.2	32.9	57.6	24.9	25.9
LnGrp LOS	E	C	C	D	D	C	D	C	C	E	C	C
Approach Vol, veh/h		1058			890			430			588	
Approach Delay, s/veh		29.0			40.4			38.2			41.2	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	22.0	10.4	34.7	14.3	27.7	12.0	33.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	18.0	11.0	28.0	16.0	19.0	8.0	31.0
Max Q Clear Time (g_c+I1), s	15.9	7.8	6.8	15.3	10.2	6.3	8.7	27.8
Green Ext Time (p_c), s	0.1	0.9	0.1	4.1	0.2	1.1	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	36.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	41.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	206	174	0	0	104	50	335	3	28	0	0	0
Future Vol, veh/h	206	174	0	0	104	50	335	3	28	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	212	179	0	0	107	52	345	3	29	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	159	0	-	-	-	0	736	762	179
Stage 1	-	-	-	-	-	-	603	603	-
Stage 2	-	-	-	-	-	-	133	159	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1420	-	0	0	-	-	386	335	864
Stage 1	-	-	0	0	-	-	546	488	-
Stage 2	-	-	0	0	-	-	893	766	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1420	-	-	-	-	-	~ 328	0	864
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 328	0	-
Stage 1	-	-	-	-	-	-	465	0	-
Stage 2	-	-	-	-	-	-	893	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.3	0	96.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	328	864	1420	-	-	-
HCM Lane V/C Ratio	1.062	0.033	0.15	-	-	-
HCM Control Delay (s)	103.8	9.3	8	-	-	-
HCM Lane LOS	F	A	A	-	-	-
HCM 95th %tile Q(veh)	12.8	0.1	0.5	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	18.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	309	342	24	416	0	0	0	0	75	2	216
Future Vol, veh/h	0	309	342	24	416	0	0	0	0	75	2	216
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	315	349	24	424	0	0	0	0	77	2	220
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	15.3	25.5	13.1
HCM LOS	C	D	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	309	342	24	416	77	216
LT Vol	0	0	24	0	75	0
Through Vol	309	0	0	416	2	0
RT Vol	0	342	0	0	0	216
Lane Flow Rate	315	349	24	424	79	220
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.543	0.532	0.047	0.755	0.168	0.397
Departure Headway (Hd)	6.2	5.487	6.916	6.407	7.695	6.484
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	580	653	516	560	465	553
Service Time	3.962	3.249	4.683	4.174	5.463	4.251
HCM Lane V/C Ratio	0.543	0.534	0.047	0.757	0.17	0.398
HCM Control Delay	16.2	14.4	10	26.4	12	13.5
HCM Lane LOS	C	B	A	D	B	B
HCM 95th-tile Q	3.2	3.1	0.1	6.6	0.6	1.9

Intersection	
Int Delay, s/veh	13

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	312	71	272	360	96	306
Future Vol, veh/h	312	71	272	360	96	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	339	77	296	391	104	333

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	416	0	1361	378
Stage 1	-	-	-	-	378	-
Stage 2	-	-	-	-	983	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1143	-	163	669
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	362	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1143	-	121	669
Mov Cap-2 Maneuver	-	-	-	-	121	-
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	362	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	39.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	121	669	-	-	1143	-
HCM Lane V/C Ratio	0.862	0.497	-	-	0.259	-
HCM Control Delay (s)	115.6	15.6	-	-	9.2	-
HCM Lane LOS	F	C	-	-	A	-
HCM 95th %tile Q(veh)	5.3	2.8	-	-	1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	12	1292	25	17	12	1326	264	15	4	261	138
Future Volume (veh/h)	116	12	1292	25	17	12	1326	264	15	4	261	138
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	122	13	1360	26	18	13	1610	0	0	4	275	145
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	12	1214	44	27	8	2247	1180	0	4	245	211
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.63	0.00	0.00	0.13	0.13	0.13
Sat Flow, veh/h	865	92	1583	0	204	60	3548	1863	0	27	1835	1583
Grp Volume(v), veh/h	135	0	1360	57	0	0	1610	0	0	279	0	145
Grp Sat Flow(s),veh/h/ln	958	0	1583	265	0	0	1774	1863	0	1861	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	36.6	0.0	0.0	16.0	0.0	10.5
Cycle Q Clear(g_c), s	16.0	0.0	16.0	16.0	0.0	0.0	36.6	0.0	0.0	16.0	0.0	10.5
Prop In Lane	0.90		1.00	0.46		0.23	1.00		0.00	0.01		1.00
Lane Grp Cap(c), veh/h	185	0	1214	79	0	0	2247	1180	0	248	0	211
V/C Ratio(X)	0.73	0.00	1.12	0.72	0.00	0.00	0.72	0.00	0.00	1.12	0.00	0.69
Avail Cap(c_a), veh/h	185	0	1214	79	0	0	2247	1180	0	248	0	211
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.4	0.0	5.1	50.8	0.0	0.0	14.8	0.0	0.0	52.0	0.0	49.6
Incr Delay (d2), s/veh	13.7	0.0	65.6	27.3	0.0	0.0	2.0	0.0	0.0	94.6	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	62.2	2.5	0.0	0.0	18.3	0.0	0.0	14.7	0.0	5.1
LnGrp Delay(d),s/veh	66.1	0.0	70.7	78.1	0.0	0.0	16.8	0.0	0.0	146.6	0.0	58.6
LnGrp LOS	E		F	E			B			F		E
Approach Vol, veh/h		1495			57			1610			424	
Approach Delay, s/veh		70.3			78.1			16.8			116.5	
Approach LOS		E			E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		80.0		20.0		20.0		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		76.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		38.6		18.0		18.0		18.0
Green Ext Time (p_c), s		8.4		0.0		0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	51.8
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	65	277	3	112	62	1441	41	104	1420	12
Future Volume (veh/h)	20	5	65	277	3	112	62	1441	41	104	1420	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	21	5	69	295	3	119	66	1533	44	111	1511	13
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	52	265	435	434	369	130	1770	792	160	1860	16
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.50	0.50	0.09	0.52	0.52
Sat Flow, veh/h	206	222	1136	1320	1863	1583	1774	3539	1583	1774	3596	31
Grp Volume(v), veh/h	95	0	0	295	3	119	66	1533	44	111	743	781
Grp Sat Flow(s),veh/h/ln	1565	0	0	1320	1863	1583	1774	1770	1583	1774	1770	1857
Q Serve(g_s), s	0.0	0.0	0.0	10.4	0.1	4.2	2.4	26.0	1.0	4.1	23.8	23.8
Cycle Q Clear(g_c), s	3.2	0.0	0.0	13.6	0.1	4.2	2.4	26.0	1.0	4.1	23.8	23.8
Prop In Lane	0.22		0.73	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	429	0	0	435	434	369	130	1770	792	160	915	961
V/C Ratio(X)	0.22	0.00	0.00	0.68	0.01	0.32	0.51	0.87	0.06	0.69	0.81	0.81
Avail Cap(c_a), veh/h	455	0	0	457	466	396	183	1770	792	183	915	961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	0.0	24.8	20.0	21.6	30.3	15.0	8.7	30.0	13.7	13.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	3.8	0.0	0.5	3.0	6.0	0.1	9.1	7.8	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	5.8	0.0	1.9	1.3	14.0	0.4	2.4	13.3	14.1
LnGrp Delay(d),s/veh	21.5	0.0	0.0	28.6	20.0	22.1	33.3	20.9	8.9	39.1	21.4	21.1
LnGrp LOS	C			C	C	C	C	C	A	D	C	C
Approach Vol, veh/h		95			417			1643			1635	
Approach Delay, s/veh		21.5			26.7			21.1			22.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.1	38.0		19.8	9.0	39.2		19.8
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	34.0		17.0	7.0	34.0		17.0
Max Q Clear Time (g_c+I1), s	6.1	28.0		5.2	4.4	25.8		15.6
Green Ext Time (p_c), s	0.0	4.4		0.3	0.0	5.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Future Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	214	433	43	589	234	1168	45	252	800	1555	214	38
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	436	473	47	532	323	1623	113	515	836	1408	1737	777
Arrive On Green	0.13	0.15	0.15	0.05	0.06	0.06	0.06	0.15	0.15	0.41	0.49	0.49
Sat Flow, veh/h	3442	3254	322	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	214	235	241	589	234	1168	45	252	800	1555	214	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1806	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	6.4	14.4	14.5	17.0	13.6	0.0	2.7	7.2	10.8	45.0	3.6	1.4
Cycle Q Clear(g_c), s	6.4	14.4	14.5	17.0	13.6	0.0	2.7	7.2	10.8	45.0	3.6	1.4
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	257	263	532	323	1623	113	515	836	1408	1737	777
V/C Ratio(X)	0.49	0.91	0.92	1.11	0.72	0.72	0.40	0.49	0.96	1.10	0.12	0.05
Avail Cap(c_a), veh/h	436	257	263	532	373	1697	113	515	836	1408	1737	777
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	44.7	46.3	46.4	52.2	49.3	20.9	49.5	43.2	19.6	32.5	15.2	14.6
Incr Delay (d2), s/veh	0.9	33.6	34.7	62.3	3.1	0.7	2.3	3.3	22.3	52.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	9.4	9.8	12.7	7.3	16.1	1.4	3.8	6.7	31.7	1.8	0.6
LnGrp Delay(d),s/veh	45.6	79.9	81.1	114.5	52.4	21.7	51.7	46.5	41.9	85.4	15.2	14.7
LnGrp LOS	D	E	F	F	D	C	D	D	D	F	B	B
Approach Vol, veh/h		690			1991			1097			1807	
Approach Delay, s/veh		69.7			52.8			43.3			75.6	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.0	20.0	21.0	20.0	11.0	58.0	17.9	23.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	45.0	16.0	17.0	16.0	7.0	54.0	11.0	22.0
Max Q Clear Time (g_c+I1), s	47.0	12.8	19.0	16.5	4.7	5.6	8.4	15.6
Green Ext Time (p_c), s	0.0	1.6	0.0	0.0	0.0	1.4	0.2	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	60.4
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Future Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1912	812	893	1952	0				967	0	153
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1544	691	688	2381	0				903	0	403
Arrive On Green	0.00	0.14	0.14	0.40	1.00	0.00				0.25	0.00	0.25
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1912	812	893	1952	0				967	0	153
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	48.0	48.0	22.0	0.0	0.0				28.0	0.0	8.8
Cycle Q Clear(g_c), s	0.0	48.0	48.0	22.0	0.0	0.0				28.0	0.0	8.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1544	691	688	2381	0				903	0	403
V/C Ratio(X)	0.00	1.24	1.18	1.30	0.82	0.00				1.07	0.00	0.38
Avail Cap(c_a), veh/h	0	1544	691	688	2381	0				903	0	403
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.1	47.1	33.0	0.0	0.0				41.0	0.0	33.8
Incr Delay (d2), s/veh	0.0	107.7	80.4	134.8	0.2	0.0				50.7	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	46.6	36.5	23.2	0.1	0.0				20.0	0.0	4.1
LnGrp Delay(d),s/veh	0.0	154.7	127.5	167.8	0.2	0.0				91.7	0.0	36.5
LnGrp LOS		F	F	F	A					F		D
Approach Vol, veh/h		2724			2845						1120	
Approach Delay, s/veh		146.6			52.8						84.2	
Approach LOS		F			D						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			26.0	52.0		32.0		78.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			22.0	48.0		28.0		74.0
Max Q Clear Time (g_c+I1), s			24.0	50.0		30.0		2.0
Green Ext Time (p_c), s			0.0	0.0		0.0		33.8

Intersection Summary	
HCM 2010 Ctrl Delay	96.3
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	2529	0	0	2071	634	682	0	1050	0	0	0
Future Volume (veh/h)	253	2529	0	0	2071	634	682	0	1050	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	258	2581	0	0	2113	647	464	0	1320			
Adj No. of Lanes	1	3	0	0	3	1	1	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	242	2866	0	0	1988	619	645	0	1152			
Arrive On Green	0.27	1.00	0.00	0.00	0.78	0.78	0.36	0.00	0.36			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	1774	0	3167			
Grp Volume(v), veh/h	258	2581	0	0	2113	647	464	0	1320			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	15.0	0.0	0.0	0.0	43.0	43.0	24.8	0.0	40.0			
Cycle Q Clear(g_c), s	15.0	0.0	0.0	0.0	43.0	43.0	24.8	0.0	40.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	242	2866	0	0	1988	619	645	0	1152			
V/C Ratio(X)	1.07	0.90	0.00	0.00	1.06	1.05	0.72	0.00	1.15			
Avail Cap(c_a), veh/h	242	2866	0	0	1988	619	645	0	1152			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.40	0.40	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.0	0.0	0.0	0.0	12.0	12.0	30.2	0.0	35.0			
Incr Delay (d2), s/veh	38.3	0.4	0.0	0.0	33.5	35.6	6.8	0.0	76.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.8	0.1	0.0	0.0	24.9	23.7	13.3	0.0	29.7			
LnGrp Delay(d),s/veh	78.3	0.4	0.0	0.0	45.5	47.6	36.9	0.0	111.4			
LnGrp LOS	F	A			F	F	D		F			
Approach Vol, veh/h		2839			2760			1784				
Approach Delay, s/veh		7.5			46.0			92.0				
Approach LOS		A			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		44.0		66.0			19.0	47.0
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		40.0		62.0			15.0	43.0
Max Q Clear Time (g_c+I1), s		42.0		2.0			17.0	45.0
Green Ext Time (p_c), s		0.0		40.0			0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.3
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	463	2524	593	279	1941	100	387	116	273	83	75	377
Future Volume (veh/h)	463	2524	593	279	1941	100	387	116	273	83	75	377
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	472	2576	605	285	1981	102	395	118	279	85	77	385
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	491	2358	734	274	2188	541	289	134	318	108	508	870
Arrive On Green	0.55	0.93	0.93	0.15	0.34	0.34	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	926	493	1165	983	1863	1583
Grp Volume(v), veh/h	472	2576	605	285	1981	102	395	0	397	85	77	385
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	926	0	1657	983	1863	1583
Q Serve(g_s), s	27.9	51.0	13.0	17.0	32.4	5.0	26.6	0.0	25.2	4.8	3.4	0.0
Cycle Q Clear(g_c), s	27.9	51.0	13.0	17.0	32.4	5.0	30.0	0.0	25.2	30.0	3.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.70	1.00		1.00
Lane Grp Cap(c), veh/h	491	2358	734	274	2188	541	289	0	452	108	508	870
V/C Ratio(X)	0.96	1.09	0.82	1.04	0.91	0.19	1.37	0.00	0.88	0.78	0.15	0.44
Avail Cap(c_a), veh/h	491	2358	734	274	2214	547	289	0	452	108	508	870
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.27	0.27	0.27	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	4.0	2.6	46.5	34.5	25.5	44.7	0.0	38.3	53.8	30.3	14.8
Incr Delay (d2), s/veh	13.4	44.0	2.2	65.0	5.8	0.2	185.6	0.0	20.8	42.2	0.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.2	27.9	4.8	13.3	15.2	2.2	23.7	0.0	14.1	3.8	1.9	7.3
LnGrp Delay(d),s/veh	37.4	48.0	4.8	111.5	40.3	25.7	230.3	0.0	59.1	95.9	31.0	16.4
LnGrp LOS	D	F	A	F	D	C	F		E	F	C	B
Approach Vol, veh/h		3653			2368			792			547	
Approach Delay, s/veh		39.5			48.2			144.5			30.8	
Approach LOS		D			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		34.0	21.0	55.0		34.0	34.4	41.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		30.0	17.0	51.0		30.0	30.0	38.0
Max Q Clear Time (g_c+I1), s		32.0	19.0	53.0		32.0	29.9	34.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	53.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	47

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1334	2	7	1284	111	0	3	10	37	2	6
Future Vol, veh/h	2	1334	2	7	1284	111	0	3	10	37	2	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1466	2	8	1411	122	0	3	11	41	2	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1533	0	0	1468	0	0	2960	3020	1467	2961	2960	1472
Stage 1	-	-	-	-	-	-	1471	1471	-	1488	1488	-
Stage 2	-	-	-	-	-	-	1489	1549	-	1473	1472	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	434	-	-	460	-	-	9	13	157	~ 9	14	156
Stage 1	-	-	-	-	-	-	158	191	-	155	188	-
Stage 2	-	-	-	-	-	-	155	175	-	158	191	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	434	-	-	460	-	-	7	13	157	~ 7	14	156
Mov Cap-2 Maneuver	-	-	-	-	-	-	7	13	-	~ 7	14	-
Stage 1	-	-	-	-	-	-	157	190	-	154	185	-
Stage 2	-	-	-	-	-	-	144	172	-	144	190	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	105.5	$ 2888.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	13	157	434	-	-	460	-	-	7	156
HCM Lane V/C Ratio	0.254	0.07	0.005	-	-	0.017	-	-	6.122	0.042
HCM Control Delay (s)	$ 358.5	29.6	13.3	-	-	13	-	-	$ 3328.7	29.1
HCM Lane LOS	F	D	B	-	-	B	-	-	F	D
HCM 95th %tile Q(veh)	0.7	0.2	0	-	-	0.1	-	-	6.8	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	890	296	153	752	417	219	343	124	298	274	174
Future Volume (veh/h)	166	890	296	153	752	417	219	343	124	298	274	174
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	175	937	312	161	792	439	231	361	131	314	288	183
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1418	634	194	764	649	264	409	146	302	642	287
Arrive On Green	0.10	0.40	0.40	0.11	0.41	0.41	0.15	0.16	0.16	0.17	0.18	0.18
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	2557	914	1774	3539	1583
Grp Volume(v), veh/h	175	937	312	161	792	439	231	248	244	314	288	183
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1701	1774	1770	1583
Q Serve(g_s), s	9.8	21.6	14.7	8.9	41.0	22.6	12.7	13.7	14.0	17.0	7.3	10.7
Cycle Q Clear(g_c), s	9.8	21.6	14.7	8.9	41.0	22.6	12.7	13.7	14.0	17.0	7.3	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	177	1418	634	194	764	649	264	283	272	302	642	287
V/C Ratio(X)	0.99	0.66	0.49	0.83	1.04	0.68	0.88	0.88	0.90	1.04	0.45	0.64
Avail Cap(c_a), veh/h	177	1418	634	284	764	649	302	283	272	302	642	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	24.4	22.4	43.6	29.5	24.1	41.7	41.0	41.2	41.5	36.5	37.9
Incr Delay (d2), s/veh	63.4	1.1	0.6	12.5	42.5	2.8	21.9	29.5	33.2	62.9	2.3	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	10.8	6.5	5.0	30.0	10.4	7.8	9.0	9.1	13.6	3.8	5.5
LnGrp Delay(d),s/veh	108.3	25.6	23.0	56.2	72.0	26.9	63.6	70.5	74.4	104.4	38.7	48.2
LnGrp LOS	F	C	C	E	F	C	E	E	E	F	D	D
Approach Vol, veh/h		1424			1392			723			785	
Approach Delay, s/veh		35.2			56.0			69.6			67.2	
Approach LOS		D			E			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	20.0	14.9	44.1	18.9	22.1	14.0	45.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	16.0	16.0	35.0	17.0	16.0	10.0	41.0
Max Q Clear Time (g_c+I1), s	19.0	16.0	10.9	23.6	14.7	12.7	11.8	43.0
Green Ext Time (p_c), s	0.0	0.0	0.2	5.4	0.1	0.7	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.4
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	24
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Future Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	144	465	0	0	230	154	244	2	146	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	1	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	29.5	23.2	16.2
HCM LOS	D	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1
Vol Left, %	99%	0%	100%	0%	0%
Vol Thru, %	1%	0%	0%	100%	60%
Vol Right, %	0%	100%	0%	0%	40%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	155	92	91	293	242
LT Vol	154	0	91	0	0
Through Vol	1	0	0	293	145
RT Vol	0	92	0	0	97
Lane Flow Rate	246	146	144	465	384
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.528	0.264	0.281	0.84	0.694
Departure Headway (Hd)	7.724	6.501	7.014	6.504	6.501
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	465	549	510	553	553
Service Time	5.504	4.279	4.792	4.282	4.576
HCM Lane V/C Ratio	0.529	0.266	0.282	0.841	0.694
HCM Control Delay	18.9	11.6	12.5	34.8	23.2
HCM Lane LOS	C	B	B	D	C
HCM 95th-tile Q	3	1.1	1.1	8.8	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	869	24	6	498	24	1	2	8	36	4	4
Future Volume (veh/h)	6	869	24	6	498	24	1	2	8	36	4	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	6	915	25	6	524	25	1	2	8	38	4	4
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	11	1104	30	11	1079	51	143	140	151	281	22	151
Arrive On Green	0.01	0.61	0.61	0.01	0.61	0.61	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1774	1805	49	1774	1764	84	300	1464	1583	1229	227	1583
Grp Volume(v), veh/h	6	0	940	6	0	549	3	0	8	42	0	4
Grp Sat Flow(s),veh/h/ln	1774	0	1854	1774	0	1848	1764	0	1583	1455	0	1583
Q Serve(g_s), s	0.1	0.0	16.7	0.1	0.0	6.9	0.0	0.0	0.2	0.9	0.0	0.1
Cycle Q Clear(g_c), s	0.1	0.0	16.7	0.1	0.0	6.9	0.1	0.0	0.2	1.1	0.0	0.1
Prop In Lane	1.00		0.03	1.00		0.05	0.33		1.00	0.90		1.00
Lane Grp Cap(c), veh/h	11	0	1134	11	0	1130	283	0	151	303	0	151
V/C Ratio(X)	0.53	0.00	0.83	0.53	0.00	0.49	0.01	0.00	0.05	0.14	0.00	0.03
Avail Cap(c_a), veh/h	169	0	1682	169	0	1676	764	0	605	713	0	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	0.0	6.4	20.8	0.0	4.5	17.2	0.0	17.2	17.6	0.0	17.2
Incr Delay (d2), s/veh	32.7	0.0	2.3	32.7	0.0	0.3	0.0	0.0	0.1	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	9.1	0.2	0.0	3.5	0.0	0.0	0.1	0.5	0.0	0.0
LnGrp Delay(d),s/veh	53.4	0.0	8.7	53.4	0.0	4.8	17.2	0.0	17.4	17.8	0.0	17.3
LnGrp LOS	D		A	D		A	B		B	B		B
Approach Vol, veh/h		946			555			11			46	
Approach Delay, s/veh		9.0			5.3			17.3			17.8	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.3	29.6		8.0	4.3	29.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	4.0	38.0
Max Q Clear Time (g_c+I1), s		2.2	2.1	18.7		3.1	2.1	8.9
Green Ext Time (p_c), s		0.0	0.0	6.9		0.1	0.0	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	57	224	281	82	247
Future Vol, veh/h	211	57	224	281	82	247
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	229	62	243	305	89	268
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	14.7	14.8	13.1
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	79%	0%	100%
Vol Right, %	0%	100%	21%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	247	268	224	281
LT Vol	82	0	0	224	0
Through Vol	0	0	211	0	281
RT Vol	0	247	57	0	0
Lane Flow Rate	89	268	291	243	305
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.179	0.449	0.488	0.445	0.515
Departure Headway (Hd)	7.241	6.021	6.026	6.575	6.068
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	495	596	597	548	593
Service Time	4.994	3.773	4.07	4.319	3.812
HCM Lane V/C Ratio	0.18	0.45	0.487	0.443	0.514
HCM Control Delay	11.6	13.6	14.7	14.5	15.1
HCM Lane LOS	B	B	B	B	C
HCM 95th-tile Q	0.6	2.3	2.7	2.3	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	906	1	6	861	100	0	2	9	27	1	5
Future Volume (veh/h)	1	906	1	6	861	100	0	2	9	27	1	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	1	996	1	7	946	110	0	2	10	30	1	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	1239	1	13	1101	128	0	152	129	254	6	129
Arrive On Green	0.00	0.67	0.67	0.01	0.67	0.67	0.00	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1774	1861	2	1774	1639	191	0	1863	1583	1340	76	1583
Grp Volume(v), veh/h	1	0	997	7	0	1056	0	2	10	31	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1862	1774	0	1829	0	1863	1583	1415	0	1583
Q Serve(g_s), s	0.0	0.0	18.9	0.2	0.0	21.9	0.0	0.0	0.3	0.9	0.0	0.1
Cycle Q Clear(g_c), s	0.0	0.0	18.9	0.2	0.0	21.9	0.0	0.0	0.3	1.0	0.0	0.1
Prop In Lane	1.00		0.00	1.00		0.10	0.00		1.00	0.97		1.00
Lane Grp Cap(c), veh/h	4	0	1240	13	0	1229	0	152	129	260	0	129
V/C Ratio(X)	0.28	0.00	0.80	0.53	0.00	0.86	0.00	0.01	0.08	0.12	0.00	0.04
Avail Cap(c_a), veh/h	145	0	1826	145	0	1793	0	609	517	605	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.4	0.0	5.9	24.2	0.0	6.2	0.0	20.7	20.8	21.1	0.0	20.7
Incr Delay (d2), s/veh	36.8	0.0	1.7	29.5	0.0	3.0	0.0	0.0	0.3	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	10.0	0.2	0.0	11.6	0.0	0.0	0.1	0.4	0.0	0.1
LnGrp Delay(d),s/veh	61.2	0.0	7.6	53.7	0.0	9.3	0.0	20.7	21.0	21.3	0.0	20.8
LnGrp LOS	E		A	D		A		C	C	C		C
Approach Vol, veh/h		998			1063			12			36	
Approach Delay, s/veh		7.6			9.5			21.0			21.2	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.4	36.6		8.0	4.1	36.9
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	48.0		16.0	4.0	48.0
Max Q Clear Time (g_c+I1), s		2.3	2.2	20.9		3.0	2.0	23.9
Green Ext Time (p_c), s		0.0	0.0	8.7		0.1	0.0	9.0

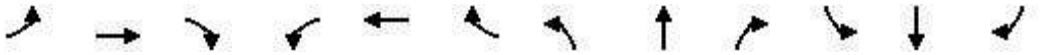
Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	29.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Future Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	494	0	0	244	163	260	3	156	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	1	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	38.8	27.6	17.7
HCM LOS	E	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1
Vol Left, %	99%	0%	100%	0%	0%
Vol Thru, %	1%	0%	0%	100%	60%
Vol Right, %	0%	100%	0%	0%	40%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	98	96	311	257
LT Vol	164	0	96	0	0
Through Vol	2	0	0	311	154
RT Vol	0	98	0	0	103
Lane Flow Rate	263	156	152	494	408
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.577	0.288	0.304	0.916	0.755
Departure Headway (Hd)	7.887	6.664	7.188	6.677	6.666
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	456	535	497	538	538
Service Time	5.676	4.451	4.977	4.466	4.751
HCM Lane V/C Ratio	0.577	0.292	0.306	0.918	0.758
HCM Control Delay	21	12.2	13.1	46.7	27.6
HCM Lane LOS	C	B	B	E	D
HCM 95th-tile Q	3.6	1.2	1.3	11	6.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	904	25	7	518	25	2	3	9	38	5	5
Future Volume (veh/h)	7	904	25	7	518	25	2	3	9	38	5	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	7	952	26	7	545	26	2	3	9	40	5	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	1129	31	13	1103	53	149	126	145	266	24	145
Arrive On Green	0.01	0.63	0.63	0.01	0.63	0.63	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1774	1805	49	1774	1764	84	368	1373	1583	1198	265	1583
Grp Volume(v), veh/h	7	0	978	7	0	571	5	0	9	45	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1854	1774	0	1848	1741	0	1583	1463	0	1583
Q Serve(g_s), s	0.2	0.0	18.2	0.2	0.0	7.3	0.0	0.0	0.2	1.0	0.0	0.1
Cycle Q Clear(g_c), s	0.2	0.0	18.2	0.2	0.0	7.3	0.1	0.0	0.2	1.2	0.0	0.1
Prop In Lane	1.00		0.03	1.00		0.05	0.40		1.00	0.89		1.00
Lane Grp Cap(c), veh/h	13	0	1160	13	0	1156	275	0	145	290	0	145
V/C Ratio(X)	0.53	0.00	0.84	0.53	0.00	0.49	0.02	0.00	0.06	0.16	0.00	0.03
Avail Cap(c_a), veh/h	163	0	1616	163	0	1610	728	0	581	685	0	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.6	0.0	6.5	21.6	0.0	4.4	18.0	0.0	18.1	18.5	0.0	18.0
Incr Delay (d2), s/veh	29.1	0.0	3.0	29.1	0.0	0.3	0.0	0.0	0.2	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	9.9	0.2	0.0	3.8	0.1	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	50.6	0.0	9.5	50.6	0.0	4.8	18.1	0.0	18.3	18.8	0.0	18.1
LnGrp LOS	D		A	D		A	B		B	B		B
Approach Vol, veh/h		985			578			14			50	
Approach Delay, s/veh		9.8			5.3			18.2			18.7	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.3	31.3		8.0	4.3	31.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	4.0	38.0
Max Q Clear Time (g_c+I1), s		2.2	2.2	20.2		3.2	2.2	9.3
Green Ext Time (p_c), s		0.0	0.0	7.1		0.1	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Future Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	159	169	0	0	106	51	303	3	27	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	1	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.2	11	15.9
HCM LOS	B	B	C

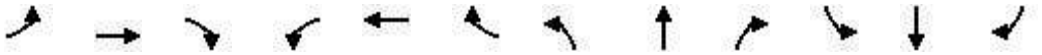
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1
Vol Left, %	99%	0%	100%	0%	0%
Vol Thru, %	1%	0%	0%	100%	68%
Vol Right, %	0%	100%	0%	0%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	297	26	154	164	152
LT Vol	294	0	154	0	0
Through Vol	3	0	0	164	103
RT Vol	0	26	0	0	49
Lane Flow Rate	306	27	159	169	157
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.545	0.039	0.281	0.276	0.258
Departure Headway (Hd)	6.409	5.203	6.376	5.87	5.938
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	563	689	565	614	605
Service Time	4.133	2.927	4.103	3.597	3.969
HCM Lane V/C Ratio	0.544	0.039	0.281	0.275	0.26
HCM Control Delay	16.6	8.1	11.6	10.8	11
HCM Lane LOS	C	A	B	B	B
HCM 95th-tile Q	3.3	0.1	1.1	1.1	1

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	224	61	237	298	87	261
Future Vol, veh/h	224	61	237	298	87	261
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	243	66	258	324	95	284
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	15.9	16.1	13.9
HCM LOS	C	C	B

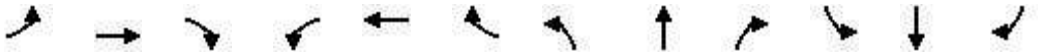
Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	79%	0%	100%
Vol Right, %	0%	100%	21%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	87	261	285	237	298
LT Vol	87	0	0	237	0
Through Vol	0	0	224	0	298
RT Vol	0	261	61	0	0
Lane Flow Rate	95	284	310	258	324
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.194	0.485	0.529	0.479	0.557
Departure Headway (Hd)	7.371	6.15	6.145	6.698	6.19
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	486	584	585	536	583
Service Time	5.129	3.907	4.198	4.452	3.943
HCM Lane V/C Ratio	0.195	0.486	0.53	0.481	0.556
HCM Control Delay	11.9	14.6	15.9	15.5	16.5
HCM Lane LOS	B	B	C	C	C
HCM 95th-tile Q	0.7	2.6	3.1	2.6	3.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	942	2	7	895	104	0	3	10	29	2	6
Future Volume (veh/h)	2	942	2	7	895	104	0	3	10	29	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	2	1035	2	8	984	114	0	3	11	32	2	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	1266	2	15	1127	131	0	145	123	236	11	123
Arrive On Green	0.00	0.68	0.68	0.01	0.69	0.69	0.00	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1774	1859	4	1774	1639	190	0	1863	1583	1290	139	1583
Grp Volume(v), veh/h	2	0	1037	8	0	1098	0	3	11	34	0	7
Grp Sat Flow(s),veh/h/ln	1774	0	1862	1774	0	1829	0	1863	1583	1429	0	1583
Q Serve(g_s), s	0.1	0.0	20.7	0.2	0.0	24.2	0.0	0.1	0.3	1.0	0.0	0.2
Cycle Q Clear(g_c), s	0.1	0.0	20.7	0.2	0.0	24.2	0.0	0.1	0.3	1.1	0.0	0.2
Prop In Lane	1.00		0.00	1.00		0.10	0.00		1.00	0.94		1.00
Lane Grp Cap(c), veh/h	4	0	1268	15	0	1257	0	145	123	247	0	123
V/C Ratio(X)	0.51	0.00	0.82	0.54	0.00	0.87	0.00	0.02	0.09	0.14	0.00	0.06
Avail Cap(c_a), veh/h	138	0	1735	138	0	1705	0	579	492	576	0	492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	5.9	25.4	0.0	6.3	0.0	21.9	22.1	22.4	0.0	22.0
Incr Delay (d2), s/veh	78.1	0.0	2.3	26.8	0.0	4.1	0.0	0.1	0.3	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	10.9	0.2	0.0	13.3	0.0	0.0	0.2	0.5	0.0	0.1
LnGrp Delay(d),s/veh	103.8	0.0	8.2	52.3	0.0	10.4	0.0	22.0	22.4	22.7	0.0	22.2
LnGrp LOS	F		A	D		B		C	C	C		C
Approach Vol, veh/h		1039			1106			14			41	
Approach Delay, s/veh		8.4			10.7			22.3			22.6	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.4	39.1		8.0	4.1	39.4
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	48.0		16.0	4.0	48.0
Max Q Clear Time (g_c+I1), s		2.3	2.2	22.7		3.1	2.1	26.2
Green Ext Time (p_c), s		0.0	0.0	9.1		0.1	0.0	9.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	318	0	0	156	105	216	2	99	0	0	0
Future Volume (veh/h)	113	318	0	0	156	105	216	2	99	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1900	1900	1863	1863			
Adj Flow Rate, veh/h	179	505	0	0	248	167	343	3	157			
Adj No. of Lanes	1	1	0	0	1	0	0	1	1			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	232	989	0	0	314	211	480	4	432			
Arrive On Green	0.13	0.53	0.00	0.00	0.30	0.30	0.27	0.27	0.27			
Sat Flow, veh/h	1774	1863	0	0	1039	700	1759	15	1583			
Grp Volume(v), veh/h	179	505	0	0	0	415	346	0	157			
Grp Sat Flow(s),veh/h/ln	1774	1863	0	0	0	1739	1775	0	1583			
Q Serve(g_s), s	4.0	7.1	0.0	0.0	0.0	8.9	7.2	0.0	3.3			
Cycle Q Clear(g_c), s	4.0	7.1	0.0	0.0	0.0	8.9	7.2	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		0.40	0.99		1.00			
Lane Grp Cap(c), veh/h	232	989	0	0	0	525	485	0	432			
V/C Ratio(X)	0.77	0.51	0.00	0.00	0.00	0.79	0.71	0.00	0.36			
Avail Cap(c_a), veh/h	435	1461	0	0	0	767	870	0	776			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	17.1	6.2	0.0	0.0	0.0	13.1	13.4	0.0	12.0			
Incr Delay (d2), s/veh	5.4	0.4	0.0	0.0	0.0	3.5	2.0	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.3	3.6	0.0	0.0	0.0	4.8	3.7	0.0	1.5			
LnGrp Delay(d),s/veh	22.5	6.6	0.0	0.0	0.0	16.5	15.4	0.0	12.5			
LnGrp LOS	C	A				B	B		B			
Approach Vol, veh/h		684			415			503				
Approach Delay, s/veh		10.7			16.5			14.5				
Approach LOS		B			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		15.1		25.7			9.3	16.3
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		20.0		32.0			10.0	18.0
Max Q Clear Time (g_c+I1), s		9.2		9.1			6.0	10.9
Green Ext Time (p_c), s		2.0		3.0			0.2	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	27.4
Intersection LOS	D

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	466	44	154	315	31	149
Future Vol, veh/h	466	44	154	315	31	149
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	536	51	177	362	36	171
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	43.7	15.6	12.1
HCM LOS	E	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	91%	0%	100%
Vol Right, %	0%	100%	9%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	31	149	510	154	315
LT Vol	31	0	0	154	0
Through Vol	0	0	466	0	315
RT Vol	0	149	44	0	0
Lane Flow Rate	36	171	586	177	362
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.077	0.313	0.926	0.318	0.6
Departure Headway (Hd)	7.814	6.585	5.686	6.475	5.967
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	458	545	639	554	605
Service Time	5.571	4.341	3.724	4.22	3.712
HCM Lane V/C Ratio	0.079	0.314	0.917	0.319	0.598
HCM Control Delay	11.2	12.3	43.7	12.2	17.3
HCM Lane LOS	B	B	E	B	C
HCM 95th-tile Q	0.2	1.3	12.2	1.4	4

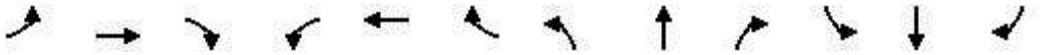
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Future Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	224	433	45	811	229	1118	47	222	526	1516	248	40
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	3	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	408	432	45	832	478	1690	251	501	1068	1863	652	554
Arrive On Green	0.12	0.13	0.13	0.08	0.08	0.08	0.14	0.14	0.14	0.35	0.35	0.35
Sat Flow, veh/h	3442	3238	335	3442	1863	2787	1774	3539	2787	5322	1863	1583
Grp Volume(v), veh/h	224	236	242	811	229	1118	47	222	526	1516	248	40
Grp Sat Flow(s),veh/h/ln	1721	1770	1804	1721	1863	1393	1774	1770	1393	1774	1863	1583
Q Serve(g_s), s	7.4	16.0	16.0	28.2	14.1	26.9	2.8	6.9	0.0	31.1	12.0	2.0
Cycle Q Clear(g_c), s	7.4	16.0	16.0	28.2	14.1	26.9	2.8	6.9	0.0	31.1	12.0	2.0
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	408	236	240	832	478	1690	251	501	1068	1863	652	554
V/C Ratio(X)	0.55	1.00	1.01	0.98	0.48	0.66	0.19	0.44	0.49	0.81	0.38	0.07
Avail Cap(c_a), veh/h	408	236	240	832	497	1718	251	501	1068	1863	652	554
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	49.9	52.0	52.0	54.9	47.3	18.0	45.4	47.2	28.1	35.4	29.2	26.0
Incr Delay (d2), s/veh	1.6	58.3	59.9	16.0	0.4	0.4	1.6	2.8	1.6	3.4	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	11.6	12.0	15.3	7.3	18.7	1.5	3.6	6.8	15.7	6.4	0.9
LnGrp Delay(d),s/veh	51.4	110.3	112.0	70.9	47.6	18.4	47.0	50.0	29.7	38.8	30.6	26.2
LnGrp LOS	D	F	F	E	D	B	D	D	C	D	C	C
Approach Vol, veh/h		702			2158			795			1804	
Approach Delay, s/veh		92.1			41.2			36.4			37.4	
Approach LOS		F			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.0	33.0	20.0		46.0	18.2	34.8
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		17.0	29.0	16.0		42.0	13.0	32.0
Max Q Clear Time (g_c+I1), s		8.9	30.2	18.0		33.1	9.4	28.9
Green Ext Time (p_c), s		2.3	0.0	0.0		5.1	0.2	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Future Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	378	1516	295	199	2146	211	442	155	224	101	108	529
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	395	1702	530	408	2189	541	405	231	334	203	283	594
Arrive On Green	0.45	0.67	0.67	0.23	0.34	0.34	0.15	0.34	0.34	0.15	0.15	0.15
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	1774	690	997	1000	1863	1583
Grp Volume(v), veh/h	378	1516	295	199	2146	211	442	0	379	101	108	529
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	1774	0	1687	1000	1863	1583
Q Serve(g_s), s	24.7	29.3	7.9	11.7	39.8	12.1	18.0	0.0	23.1	11.6	6.3	11.0
Cycle Q Clear(g_c), s	24.7	29.3	7.9	11.7	39.8	12.1	18.0	0.0	23.1	12.7	6.3	11.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	395	1702	530	408	2189	541	405	0	566	203	283	594
V/C Ratio(X)	0.96	0.89	0.56	0.49	0.98	0.39	1.09	0.00	0.67	0.50	0.38	0.89
Avail Cap(c_a), veh/h	399	1907	594	408	2189	541	405	0	566	203	283	594
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	18.0	6.9	40.1	39.1	30.0	39.6	0.0	34.2	49.0	45.8	15.7
Incr Delay (d2), s/veh	29.1	4.3	0.7	0.9	14.8	0.5	71.7	0.0	6.2	8.5	3.9	18.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.2	13.9	3.4	5.9	19.8	5.3	12.7	0.0	11.7	3.7	3.5	12.7
LnGrp Delay(d),s/veh	61.8	22.3	7.6	41.0	53.9	30.5	111.3	0.0	40.4	57.5	49.6	33.8
LnGrp LOS	E	C	A	D	D	C	F		D	E	D	C
Approach Vol, veh/h		2189			2556			821			738	
Approach Delay, s/veh		27.2			51.0			78.6			39.4	
Approach LOS		C			D			E			D	

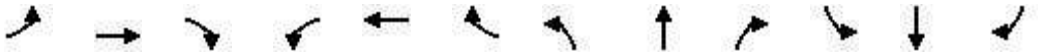
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		44.3	31.6	44.2	22.0	22.3	30.7	45.0
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		40.0	23.0	45.0	18.0	18.0	27.0	41.0
Max Q Clear Time (g_c+I1), s		25.1	13.7	31.3	20.0	14.7	26.7	41.8
Green Ext Time (p_c), s		2.0	0.3	8.9	0.0	1.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.9
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1187	25	7	794	32	2	3	9	47	5	5
Future Volume (veh/h)	7	1187	25	7	794	32	2	3	9	47	5	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	7	1249	26	7	836	34	2	3	9	49	5	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	1217	25	13	1190	48	58	63	292	79	4	292
Arrive On Green	0.01	0.67	0.67	0.01	0.67	0.67	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	1818	38	1774	1778	72	0	343	1583	0	24	1583
Grp Volume(v), veh/h	7	0	1275	7	0	870	5	0	9	54	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1856	1774	0	1850	343	0	1583	24	0	1583
Q Serve(g_s), s	0.3	0.0	58.0	0.3	0.0	25.4	0.0	0.0	0.4	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.3	0.0	58.0	0.3	0.0	25.4	16.0	0.0	0.4	16.0	0.0	0.2
Prop In Lane	1.00		0.02	1.00		0.04	0.40		1.00	0.91		1.00
Lane Grp Cap(c), veh/h	13	0	1243	13	0	1239	122	0	292	84	0	292
V/C Ratio(X)	0.55	0.00	1.03	0.55	0.00	0.70	0.04	0.00	0.03	0.65	0.00	0.02
Avail Cap(c_a), veh/h	82	0	1243	82	0	1239	122	0	292	84	0	292
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.9	0.0	14.3	42.9	0.0	8.9	29.8	0.0	29.0	42.0	0.0	28.9
Incr Delay (d2), s/veh	32.4	0.0	32.3	32.4	0.0	1.8	0.1	0.0	0.0	15.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	40.2	0.3	0.0	13.4	0.1	0.0	0.2	1.6	0.0	0.1
LnGrp Delay(d),s/veh	75.3	0.0	46.6	75.3	0.0	10.7	30.0	0.0	29.0	57.8	0.0	28.9
LnGrp LOS	E		F	E		B	C		C	E		C
Approach Vol, veh/h		1282			877			14			59	
Approach Delay, s/veh		46.8			11.2			29.3			55.4	
Approach LOS		D			B			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.0	4.6	62.0		20.0	4.6	62.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	58.0		16.0	4.0	58.0
Max Q Clear Time (g_c+I1), s		18.0	2.3	60.0		18.0	2.3	27.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	6.8

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	174	0	0	104	50	335	3	28	0	0	0
Future Volume (veh/h)	206	174	0	0	104	50	335	3	28	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1900	1900	1863	1863			
Adj Flow Rate, veh/h	212	179	0	0	107	52	345	3	29			
Adj No. of Lanes	1	1	0	0	1	0	0	1	1			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	282	832	0	0	186	91	514	4	462			
Arrive On Green	0.16	0.45	0.00	0.00	0.16	0.16	0.29	0.29	0.29			
Sat Flow, veh/h	1774	1863	0	0	1185	576	1759	15	1583			
Grp Volume(v), veh/h	212	179	0	0	0	159	348	0	29			
Grp Sat Flow(s),veh/h/ln	1774	1863	0	0	0	1761	1775	0	1583			
Q Serve(g_s), s	3.5	1.8	0.0	0.0	0.0	2.6	5.3	0.0	0.4			
Cycle Q Clear(g_c), s	3.5	1.8	0.0	0.0	0.0	2.6	5.3	0.0	0.4			
Prop In Lane	1.00		0.00	0.00		0.33	0.99		1.00			
Lane Grp Cap(c), veh/h	282	832	0	0	0	277	518	0	462			
V/C Ratio(X)	0.75	0.22	0.00	0.00	0.00	0.57	0.67	0.00	0.06			
Avail Cap(c_a), veh/h	753	2007	0	0	0	920	1101	0	982			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	12.3	5.2	0.0	0.0	0.0	12.0	9.5	0.0	7.8			
Incr Delay (d2), s/veh	4.0	0.1	0.0	0.0	0.0	1.9	1.5	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.0	0.9	0.0	0.0	0.0	1.4	2.7	0.0	0.2			
LnGrp Delay(d),s/veh	16.3	5.3	0.0	0.0	0.0	13.8	11.1	0.0	7.9			
LnGrp LOS	B	A				B	B		A			
Approach Vol, veh/h		391			159			377				
Approach Delay, s/veh		11.3			13.8			10.8				
Approach LOS		B			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		12.9		17.7			8.9	8.8
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		19.0		33.0			13.0	16.0
Max Q Clear Time (g_c+I1), s		7.3		3.8			5.5	4.6
Green Ext Time (p_c), s		1.7		0.9			0.3	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	22.8
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	312	71	272	360	96	306
Future Vol, veh/h	312	71	272	360	96	306
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	339	77	296	391	104	333
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	27.5	23.1	17.9
HCM LOS	D	C	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	81%	0%	100%
Vol Right, %	0%	100%	19%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	306	383	272	360
LT Vol	96	0	0	272	0
Through Vol	0	0	312	0	360
RT Vol	0	306	71	0	0
Lane Flow Rate	104	333	416	296	391
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.228	0.614	0.758	0.591	0.726
Departure Headway (Hd)	7.879	6.65	6.551	7.193	6.682
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	454	539	550	500	536
Service Time	5.659	4.429	4.624	4.979	4.468
HCM Lane V/C Ratio	0.229	0.618	0.756	0.592	0.729
HCM Control Delay	13	19.5	27.5	20	25.4
HCM Lane LOS	B	C	D	C	D
HCM 95th-tile Q	0.9	4.1	6.7	3.8	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Future Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	214	433	43	589	234	1168	45	252	800	1555	214	38
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	3	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	473	47	626	406	1621	290	579	963	1935	677	576
Arrive On Green	0.11	0.15	0.15	0.30	0.36	0.36	0.16	0.16	0.16	0.36	0.36	0.36
Sat Flow, veh/h	3442	3254	322	3442	1863	2787	1774	3539	2787	5322	1863	1583
Grp Volume(v), veh/h	214	235	241	589	234	1168	45	252	800	1555	214	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1806	1721	1863	1393	1774	1770	1393	1774	1863	1583
Q Serve(g_s), s	6.5	14.4	14.5	18.4	11.1	24.0	2.4	7.1	18.0	28.9	9.1	1.7
Cycle Q Clear(g_c), s	6.5	14.4	14.5	18.4	11.1	24.0	2.4	7.1	18.0	28.9	9.1	1.7
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	375	257	263	626	406	1621	290	579	963	1935	677	576
V/C Ratio(X)	0.57	0.91	0.92	0.94	0.58	0.72	0.16	0.44	0.83	0.80	0.32	0.07
Avail Cap(c_a), veh/h	375	257	263	626	406	1621	290	579	963	1935	677	576
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.56	0.56	0.56	1.00	1.00	1.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	46.5	46.3	46.4	37.7	30.9	11.9	39.5	41.4	33.1	31.5	25.2	22.8
Incr Delay (d2), s/veh	2.0	33.6	34.7	14.9	1.1	0.9	1.1	2.4	8.3	1.8	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	9.4	9.8	9.9	5.8	17.8	1.3	3.6	12.2	14.4	4.7	0.8
LnGrp Delay(d),s/veh	48.6	79.9	81.1	52.6	32.0	12.8	40.6	43.8	41.3	33.3	25.8	22.9
LnGrp LOS	D	E	F	D	C	B	D	D	D	C	C	C
Approach Vol, veh/h		690			1991			1097			1807	
Approach Delay, s/veh		70.6			26.8			41.9			32.2	
Approach LOS		E			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		22.0	24.0	20.0		44.0	16.0	28.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		18.0	20.0	16.0		40.0	12.0	24.0
Max Q Clear Time (g_c+I1), s		20.0	20.4	16.5		30.9	8.5	26.0
Green Ext Time (p_c), s		0.0	0.0	0.0		5.2	0.2	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	36.9
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Future Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1912	812	893	1952	0				967	0	153
Adj No. of Lanes	0	3	1	2	2	0				3	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1988	619	928	2466	0				1227	0	365
Arrive On Green	0.00	0.78	0.78	0.54	1.00	0.00				0.23	0.00	0.23
Sat Flow, veh/h	0	5253	1583	3442	3632	0				5322	0	1583
Grp Volume(v), veh/h	0	1912	812	893	1952	0				967	0	153
Grp Sat Flow(s),veh/h/ln	0	1695	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	36.4	43.0	27.4	0.0	0.0				18.8	0.0	9.1
Cycle Q Clear(g_c), s	0.0	36.4	43.0	27.4	0.0	0.0				18.8	0.0	9.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1988	619	928	2466	0				1227	0	365
V/C Ratio(X)	0.00	0.96	1.31	0.96	0.79	0.00				0.79	0.00	0.42
Avail Cap(c_a), veh/h	0	1988	619	939	2477	0				1227	0	365
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.33	0.33	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.3	12.0	24.8	0.0	0.0				39.8	0.0	36.1
Incr Delay (d2), s/veh	0.0	5.4	144.3	3.5	0.2	0.0				5.2	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.9	42.3	13.1	0.1	0.0				9.8	0.0	4.3
LnGrp Delay(d),s/veh	0.0	16.7	156.3	28.3	0.2	0.0				45.0	0.0	39.6
LnGrp LOS		B	F	C	A					D		D
Approach Vol, veh/h		2724			2845						1120	
Approach Delay, s/veh		58.3			9.0						44.2	
Approach LOS		E			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			33.6	47.0		29.4		80.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			30.0	43.0		25.0		77.0
Max Q Clear Time (g_c+I1), s			29.4	45.0		20.8		2.0
Green Ext Time (p_c), s			0.3	0.0		1.9		34.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1334	2	7	1284	111	0	3	10	37	2	6
Future Volume (veh/h)	2	1334	2	7	1284	111	0	3	10	37	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	2	1466	2	8	1411	122	0	3	11	41	2	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	1538	2	14	1408	122	0	96	81	134	3	81
Arrive On Green	0.00	0.83	0.83	0.01	0.83	0.83	0.00	0.05	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1774	1860	3	1774	1691	146	0	1863	1583	1305	64	1583
Grp Volume(v), veh/h	2	0	1468	8	0	1533	0	3	11	43	0	7
Grp Sat Flow(s),veh/h/ln	1774	0	1862	1774	0	1837	0	1863	1583	1368	0	1583
Q Serve(g_s), s	0.1	0.0	68.0	0.5	0.0	88.0	0.0	0.2	0.7	3.2	0.0	0.4
Cycle Q Clear(g_c), s	0.1	0.0	68.0	0.5	0.0	88.0	0.0	0.2	0.7	3.3	0.0	0.4
Prop In Lane	1.00		0.00	1.00		0.08	0.00		1.00	0.95		1.00
Lane Grp Cap(c), veh/h	4	0	1540	14	0	1530	0	96	81	137	0	81
V/C Ratio(X)	0.52	0.00	0.95	0.57	0.00	1.00	0.00	0.03	0.14	0.31	0.00	0.09
Avail Cap(c_a), veh/h	67	0	1551	67	0	1530	0	282	240	278	0	240
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	7.5	52.2	0.0	8.8	0.0	47.6	47.9	49.2	0.0	47.8
Incr Delay (d2), s/veh	80.7	0.0	13.3	31.5	0.0	23.5	0.0	0.1	0.7	1.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	39.1	0.4	0.0	52.5	0.0	0.1	0.3	1.3	0.0	0.2
LnGrp Delay(d),s/veh	133.4	0.0	20.8	83.7	0.0	32.3	0.0	47.8	48.6	50.5	0.0	48.2
LnGrp LOS	F		C	F		F		D	D	D		D
Approach Vol, veh/h		1470			1541			14			50	
Approach Delay, s/veh		20.9			32.6			48.4			50.2	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.4	4.8	91.4		9.4	4.2	92.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	88.0		16.0	4.0	88.0
Max Q Clear Time (g_c+I1), s		2.7	2.5	70.0		5.3	2.1	90.0
Green Ext Time (p_c), s		0.0	0.0	13.6		0.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	49	2	185	75
Average Queue (ft)	14	0	59	38
95th Queue (ft)	41	2	128	71
Link Distance (ft)		234	204	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			11	2
Queuing Penalty (veh)			14	4

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	107	118	48	74	84	58
Average Queue (ft)	39	30	23	42	41	29
95th Queue (ft)	72	88	47	64	66	49
Link Distance (ft)	334			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)	0	0			2	0
Queuing Penalty (veh)	0	0			1	0

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	4	57	49	64
Average Queue (ft)	0	23	15	32
95th Queue (ft)	5	51	42	52
Link Distance (ft)	181		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	T	R
Maximum Queue (ft)	91	192	29	264	38	11	69	60
Average Queue (ft)	36	83	3	113	7	2	28	23
95th Queue (ft)	69	157	16	222	26	11	61	50
Link Distance (ft)	791	791	244	421	421		1067	1067
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						270		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	40	113	17	43	74	188	54	26	78	201	50
Average Queue (ft)	13	49	1	16	24	80	12	4	33	88	14
95th Queue (ft)	38	90	9	36	52	159	39	20	67	169	37
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)						0				0	
Queuing Penalty (veh)						0				0	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	104	109	205	253	151	148	168	177	139	125	468	75
Average Queue (ft)	54	57	79	138	69	80	91	104	77	42	229	73
95th Queue (ft)	91	100	156	222	125	133	155	161	123	116	440	82
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)			0							0	34	38
Queuing Penalty (veh)			1							2	139	64

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	387	458	130	61	39
Average Queue (ft)	201	282	22	20	6
95th Queue (ft)	331	423	79	47	24
Link Distance (ft)			860	860	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	201	220	282	234	240	96	164	124	195	125
Average Queue (ft)	97	134	158	148	155	35	80	46	126	55
95th Queue (ft)	176	205	251	218	229	64	131	123	206	127
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)									5	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								0	16	0
Queuing Penalty (veh)								1	33	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	101	87	113	115	206	320	411	169	124	330	125
Average Queue (ft)	41	31	33	38	104	124	202	62	96	301	30
95th Queue (ft)	85	71	75	86	177	250	346	131	173	316	110
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)							0			59	
Queuing Penalty (veh)							0			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									2	55	0
Queuing Penalty (veh)									14	295	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	303	178	201	197	65	205	297	295	377	328	179	144
Average Queue (ft)	167	65	81	79	19	85	150	144	207	164	57	63
95th Queue (ft)	260	147	164	161	47	161	244	259	348	300	130	123
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							0	0	2	1		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	2			1	0	1
Queuing Penalty (veh)						0	2			1	0	2

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	228	178	212	175
Average Queue (ft)	96	58	69	113
95th Queue (ft)	179	133	177	187
Link Distance (ft)	231		201	
Upstream Blk Time (%)	0	0	1	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	5	1		4
Queuing Penalty (veh)	4	4		7

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	LT	R
Maximum Queue (ft)	30	27	17	7	82	36
Average Queue (ft)	2	3	2	0	31	1
95th Queue (ft)	16	17	13	5	66	16
Link Distance (ft)			335		411	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100	100		50		50
Storage Blk Time (%)				0	6	0
Queuing Penalty (veh)				0	0	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	174	283	224	77	109	295	67	146	177	114	168	149
Average Queue (ft)	80	126	77	34	20	151	32	77	58	7	100	55
95th Queue (ft)	150	219	178	62	64	233	57	138	134	52	159	103
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	0	7	0			7		4	0		2	0
Queuing Penalty (veh)	0	9	0			2		7	0		2	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	85	70
Average Queue (ft)	25	29
95th Queue (ft)	62	54
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 611

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	NB	NB
Directions Served	L	LT	R
Maximum Queue (ft)	60	155	63
Average Queue (ft)	12	72	22
95th Queue (ft)	40	123	56
Link Distance (ft)		204	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	275		50
Storage Blk Time (%)		16	0
Queuing Penalty (veh)		4	1

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	62	89	31	84	102	75
Average Queue (ft)	32	17	16	49	35	40
95th Queue (ft)	54	62	41	76	69	65
Link Distance (ft)	334			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)					1	2
Queuing Penalty (veh)					1	1

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	9	58	90	100
Average Queue (ft)	0	27	37	49
95th Queue (ft)	4	56	72	81
Link Distance (ft)	181		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	T	R
Maximum Queue (ft)	112	369	92	427	232	24	262	136
Average Queue (ft)	51	182	36	279	53	1	120	51
95th Queue (ft)	96	467	77	426	146	12	242	103
Link Distance (ft)	791	791	244	421	421		1067	1067
Upstream Blk Time (%)		1		1	0			
Queuing Penalty (veh)		6		3	0			
Storage Bay Dist (ft)						270		
Storage Blk Time (%)							4	
Queuing Penalty (veh)							0	

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	79	199	13	87	233	390	277	30	174	370	222
Average Queue (ft)	33	103	1	30	46	220	75	8	63	191	55
95th Queue (ft)	67	174	7	63	159	392	235	29	158	355	206
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)										3	1
Queuing Penalty (veh)										15	3
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)						9	0			8	
Queuing Penalty (veh)						4	0			8	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	114	122	241	314	115	125	175	165	104	124	427	75
Average Queue (ft)	58	47	79	169	56	63	80	96	54	40	173	71
95th Queue (ft)	100	91	183	272	100	111	144	140	90	97	365	84
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)	0		0							0	30	28
Queuing Penalty (veh)	0		1							0	121	47

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	615	642	386	196	25
Average Queue (ft)	436	500	183	27	5
95th Queue (ft)	734	741	726	129	18
Link Distance (ft)			860	860	
Upstream Blk Time (%)			2		
Queuing Penalty (veh)			10		
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)	1	8	1		
Queuing Penalty (veh)	1	5	7		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	475	499	303	174	166	104	224	125	225	125
Average Queue (ft)	223	273	118	103	104	27	79	114	189	78
95th Queue (ft)	439	465	250	154	153	69	169	161	210	164
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)	0	1	0						61	
Queuing Penalty (veh)	1	3	0						0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								4	64	0
Queuing Penalty (veh)								19	226	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	150	127	153	144	289	339	461	249	125	335	125
Average Queue (ft)	66	49	81	92	70	99	224	40	83	301	62
95th Queue (ft)	121	100	128	131	173	248	427	151	172	317	159
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)					0		1	0		63	
Queuing Penalty (veh)					0		2	1		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									0	58	0
Queuing Penalty (veh)									1	352	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	185	163	240	246	58	208	365	409	469	456	274	144
Average Queue (ft)	82	33	80	90	20	96	192	272	366	332	69	71
95th Queue (ft)	147	96	151	159	47	182	363	503	545	551	227	139
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							1	7	35	26		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	4			14	0	1
Queuing Penalty (veh)						0	5			11	0	2

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	241	99	128	162
Average Queue (ft)	119	38	33	64
95th Queue (ft)	216	80	85	126
Link Distance (ft)	231		201	
Upstream Blk Time (%)	2		0	
Queuing Penalty (veh)	0		0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	10			0
Queuing Penalty (veh)	10			0

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	R
Maximum Queue (ft)	23	142	28	4	28	14	133	29
Average Queue (ft)	1	24	3	0	3	0	42	2
95th Queue (ft)	12	202	16	3	16	7	127	23
Link Distance (ft)		708		791	335		411	
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)	100		100			50		50
Storage Blk Time (%)		3				0	21	0
Queuing Penalty (veh)		0				0	1	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	467	467	250	184	397	124	155	407	314	172	284
Average Queue (ft)	172	429	425	241	59	228	60	136	244	154	120	110
95th Queue (ft)	195	491	502	312	155	368	99	182	460	371	187	243
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		61	60						21			0
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	7	93	80	1		25		44	5	1	12	0
Queuing Penalty (veh)	23	148	225	4		12		151	19	3	16	1

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	188	85
Average Queue (ft)	61	42
95th Queue (ft)	172	73
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1476

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	NB	NB
Directions Served	L	LT	R
Maximum Queue (ft)	58	212	75
Average Queue (ft)	16	66	42
95th Queue (ft)	46	155	76
Link Distance (ft)		204	
Upstream Blk Time (%)		4	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	275		50
Storage Blk Time (%)		17	2
Queuing Penalty (veh)		22	4

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	88	117	48	94	121	72
Average Queue (ft)	39	26	23	46	44	35
95th Queue (ft)	68	82	48	73	81	58
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)		0			2	1
Queuing Penalty (veh)		0			2	1

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	15	57	40	78
Average Queue (ft)	1	27	14	34
95th Queue (ft)	8	55	37	62
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	96	239	29	156	180	90	57
Average Queue (ft)	43	115	2	77	94	45	21
95th Queue (ft)	80	203	14	137	162	78	48
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	47	101	17	57	69	86	111	30	63	218	55
Average Queue (ft)	9	44	1	16	21	32	53	5	27	92	19
95th Queue (ft)	34	83	7	39	50	70	99	22	52	176	46
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)										0	
Queuing Penalty (veh)										0	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	158	172	250	294	156	170	176	150	168	124	507	75
Average Queue (ft)	42	113	92	149	73	88	87	90	105	50	227	73
95th Queue (ft)	137	179	196	254	130	141	146	132	155	127	424	82
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				0								
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)	0	6	0							0	34	41
Queuing Penalty (veh)	0	10	1							2	135	70

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	543	553	293	128	38
Average Queue (ft)	272	344	33	23	7
95th Queue (ft)	489	536	164	81	24
Link Distance (ft)			860	860	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	0	0			

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	170	240	287	233	245	80	154	124	190	125
Average Queue (ft)	98	140	168	146	155	34	76	49	134	62
95th Queue (ft)	160	213	259	210	226	68	133	126	213	140
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)									7	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								0	18	0
Queuing Penalty (veh)								0	37	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	116	77	97	99	207	360	422	161	125	327	125
Average Queue (ft)	45	29	35	40	102	131	215	56	94	300	30
95th Queue (ft)	92	66	72	84	183	281	372	127	171	316	109
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)							0			60	
Queuing Penalty (veh)							0			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	56	0
Queuing Penalty (veh)									12	305	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	284	195	210	209	83	164	344	354	446	437	279	144
Average Queue (ft)	162	60	79	79	21	76	139	143	217	167	53	61
95th Queue (ft)	247	130	153	155	53	135	241	268	375	323	127	133
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							0	0	2	1		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)							1			1	0	1
Queuing Penalty (veh)							2			1	0	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	228	168	198	173
Average Queue (ft)	101	49	74	113
95th Queue (ft)	189	110	182	188
Link Distance (ft)	231		201	
Upstream Blk Time (%)	1	0	2	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	6		0	5
Queuing Penalty (veh)	5		0	7

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	L	LT	LT	R
Maximum Queue (ft)	23	4	29	28	96	29
Average Queue (ft)	2	0	5	3	31	2
95th Queue (ft)	15	3	22	17	71	19
Link Distance (ft)		708		335	411	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100		100			50
Storage Blk Time (%)					7	0
Queuing Penalty (veh)					0	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	312	265	118	139	314	64	152	186	56	169	166
Average Queue (ft)	100	168	112	42	28	157	32	83	59	6	114	58
95th Queue (ft)	193	297	241	106	86	260	54	149	133	43	173	119
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	3	19	1	0		10		7	0		3	0
Queuing Penalty (veh)	7	24	2	0		2		11	0		3	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	74	61
Average Queue (ft)	28	28
95th Queue (ft)	62	53
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 671

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	NB	NB
Directions Served	L	LT	R
Maximum Queue (ft)	48	169	68
Average Queue (ft)	17	72	21
95th Queue (ft)	44	128	54
Link Distance (ft)		204	
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	275		50
Storage Blk Time (%)		16	0
Queuing Penalty (veh)		4	0

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	74	90	31	89	84	72
Average Queue (ft)	35	14	15	48	36	42
95th Queue (ft)	60	57	40	73	68	67
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)					1	2
Queuing Penalty (veh)					1	2

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	13	80	96	116
Average Queue (ft)	0	27	34	50
95th Queue (ft)	6	61	69	87
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	129	572	89	435	452	315	136
Average Queue (ft)	59	242	37	318	336	151	55
95th Queue (ft)	107	578	73	508	511	292	106
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		2		6	10		
Queuing Penalty (veh)		8		35	57		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	104	239	13	98	155	463	461	128	245	453	460
Average Queue (ft)	37	112	1	38	51	238	262	35	109	285	100
95th Queue (ft)	79	188	6	83	180	678	693	170	265	499	341
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)						2	3			7	1
Queuing Penalty (veh)						8	13			40	6
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)						17	20	0	0	27	
Queuing Penalty (veh)						8	5	0	0	26	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	150	170	261	318	110	118	184	136	169	125	535	75
Average Queue (ft)	32	98	93	168	57	60	77	72	97	47	239	72
95th Queue (ft)	120	167	229	281	99	106	136	115	144	118	500	85
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)	1	7	0							0	37	32
Queuing Penalty (veh)	1	11	1							1	151	55

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	662	675	860	65	24
Average Queue (ft)	567	601	468	23	5
95th Queue (ft)	804	786	1139	49	16
Link Distance (ft)			860	860	
Upstream Blk Time (%)			5		
Queuing Penalty (veh)			31		
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)	4	22	1		
Queuing Penalty (veh)	3	15	14		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	502	511	473	200	224	86	247	125	210	125
Average Queue (ft)	215	273	134	108	112	26	85	120	188	79
95th Queue (ft)	407	439	275	167	178	59	194	149	199	165
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)	0	0	0						62	
Queuing Penalty (veh)	1	2	0						0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								6	64	0
Queuing Penalty (veh)								24	225	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	150	151	158	147	237	401	470	248	125	338	125
Average Queue (ft)	69	52	80	96	70	98	212	36	93	301	66
95th Queue (ft)	126	112	126	139	165	265	418	127	175	319	162
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	0	0		62	
Queuing Penalty (veh)						0	2	0		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									0	58	0
Queuing Penalty (veh)									2	360	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	235	190	193	223	70	176	398	416	464	460	270	144
Average Queue (ft)	88	41	80	91	22	86	173	247	349	309	61	72
95th Queue (ft)	178	117	147	160	57	157	346	469	526	520	205	142
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							0	4	24	19		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	2			7	0	1
Queuing Penalty (veh)						0	3			5	0	2

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	245	90	135	161
Average Queue (ft)	123	37	36	69
95th Queue (ft)	216	75	82	131
Link Distance (ft)	231		201	
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	9		0	0
Queuing Penalty (veh)	8		0	1

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	WB	NB	NB	SB	SB
Directions Served	TR	L	LT	R	LT	R
Maximum Queue (ft)	193	30	28	8	164	58
Average Queue (ft)	38	3	2	0	50	3
95th Queue (ft)	271	18	13	5	135	27
Link Distance (ft)	708		335		411	
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)		100		50		50
Storage Blk Time (%)	5			0	34	0
Queuing Penalty (veh)	0			0	2	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	468	462	250	185	324	128	155	427	322	174	375
Average Queue (ft)	171	407	389	216	51	193	59	136	235	135	135	140
95th Queue (ft)	199	527	543	341	142	296	103	185	433	347	204	312
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		48	46						11			0
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	6	88	65	1	0	16		43	4	0	23	0
Queuing Penalty (veh)	22	139	184	3	0	8		150	14	1	31	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	300	91
Average Queue (ft)	81	44
95th Queue (ft)	228	76
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1691

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	EB	WB	NB	NB
Directions Served	L	T	TR	LT	R
Maximum Queue (ft)	66	4	14	229	75
Average Queue (ft)	17	0	1	80	45
95th Queue (ft)	49	3	8	186	81
Link Distance (ft)		716	234	204	
Upstream Blk Time (%)				7	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	275				50
Storage Blk Time (%)				20	3
Queuing Penalty (veh)				28	7

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	91	150	45	86	114	72
Average Queue (ft)	42	37	24	46	48	38
95th Queue (ft)	72	107	47	72	87	65
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)		1			3	1
Queuing Penalty (veh)		2			2	2

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	9	65	56	79
Average Queue (ft)	0	28	14	39
95th Queue (ft)	5	57	39	67
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	98	266	38	201	234	110	69
Average Queue (ft)	46	109	5	96	116	46	29
95th Queue (ft)	83	196	25	172	199	88	58
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	40	121	18	56	65	93	119	29	80	235	54
Average Queue (ft)	14	50	2	17	25	34	55	5	28	106	17
95th Queue (ft)	40	94	11	41	56	77	102	22	60	196	42
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)										0	
Queuing Penalty (veh)										0	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	161	174	258	305	130	140	190	150	160	78	216	303
Average Queue (ft)	45	118	106	161	78	87	80	81	96	27	65	114
95th Queue (ft)	145	181	217	269	127	137	150	132	153	60	136	259
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				0								
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	0	6	2							0	1	3
Queuing Penalty (veh)	0	10	3							0	1	13

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	75	64	531	544	137	54	28
Average Queue (ft)	69	52	269	344	24	20	5
95th Queue (ft)	85	76	468	523	111	46	19
Link Distance (ft)					860	860	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	38	8	0	0			
Queuing Penalty (veh)	26	5	0	0			

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	203	246	310	286	291	110	165	124	194	125
Average Queue (ft)	104	142	174	162	166	35	82	46	138	66
95th Queue (ft)	167	214	273	235	239	78	138	121	219	140
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)									7	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								0	20	0
Queuing Penalty (veh)								1	44	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	109	92	108	125	278	405	429	178	125	334	125
Average Queue (ft)	43	32	38	38	118	139	223	71	94	301	30
95th Queue (ft)	85	74	83	89	218	295	393	147	172	317	107
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	0			58	
Queuing Penalty (veh)						0	2			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	55	0
Queuing Penalty (veh)									9	317	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	321	143	184	182	62	219	302	358	421	393	204	144
Average Queue (ft)	169	50	73	75	19	95	159	159	236	186	61	63
95th Queue (ft)	262	105	130	141	45	179	262	277	396	333	138	130
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)								0	1	0		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	3			1	0	3
Queuing Penalty (veh)						1	4			1	0	7

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	225	146	216	175
Average Queue (ft)	103	51	76	114
95th Queue (ft)	194	109	188	190
Link Distance (ft)	231		201	
Upstream Blk Time (%)	0	0	1	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	6	0	0	5
Queuing Penalty (veh)	5	0	0	8

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LT	LT
Maximum Queue (ft)	23	12	29	32	112
Average Queue (ft)	2	0	5	4	31
95th Queue (ft)	13	8	22	20	76
Link Distance (ft)		708		335	411
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100		100		
Storage Blk Time (%)				0	10
Queuing Penalty (veh)				0	1

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	174	336	320	152	158	304	68	143	194	119	171	224
Average Queue (ft)	93	165	116	57	27	160	34	82	60	10	107	64
95th Queue (ft)	178	337	286	160	95	270	59	141	142	63	169	153
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		2	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	1	20	5	0		11		5	0		5	0
Queuing Penalty (veh)	3	27	12	0		3		8	1		5	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	100	74
Average Queue (ft)	30	30
95th Queue (ft)	71	58
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 558

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	51	23	187	75
Average Queue (ft)	19	1	84	23
95th Queue (ft)	46	17	148	65
Link Distance (ft)		234	204	
Upstream Blk Time (%)			2	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			23	0
Queuing Penalty (veh)			6	1

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	75	74	95	215	95	70
Average Queue (ft)	34	17	18	76	40	45
95th Queue (ft)	60	59	66	274	87	70
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)				2	2	
Queuing Penalty (veh)				7	0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)				4	1	6
Queuing Penalty (veh)				1	1	4

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	48	95	70	91	94
Average Queue (ft)	4	39	21	36	46
95th Queue (ft)	37	98	154	69	75
Link Distance (ft)	187		340	1067	1067
Upstream Blk Time (%)	0		4		
Queuing Penalty (veh)	0		19		
Storage Bay Dist (ft)		135			
Storage Blk Time (%)		5	0		
Queuing Penalty (veh)		14	0		

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	512	816	119	441	469	852	682
Average Queue (ft)	78	547	44	392	405	431	144
95th Queue (ft)	265	996	98	503	501	934	564
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		8		14	20	5	2
Queuing Penalty (veh)		37		80	116	7	2
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	98	293	94	123	275	815	826	275	245	464	464
Average Queue (ft)	38	132	5	46	89	396	414	57	161	398	193
95th Queue (ft)	74	222	58	96	270	910	916	230	326	543	512
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)		0	0			5	6			23	4
Queuing Penalty (veh)		0	0			27	34			130	24
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)					0	36	41	0	0	55	
Queuing Penalty (veh)					0	17	11	0	0	57	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	154	171	311	311	118	126	168	235	254	98	208	366
Average Queue (ft)	51	117	92	170	53	59	75	79	95	30	65	140
95th Queue (ft)	154	181	232	282	97	101	140	186	200	72	166	294
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	2	9	0							0	6	9
Queuing Penalty (veh)	3	16	1							0	2	34

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	75	63	662	675	891	186	34
Average Queue (ft)	70	50	647	664	737	27	5
95th Queue (ft)	86	79	738	725	1196	124	20
Link Distance (ft)					860	860	
Upstream Blk Time (%)					9		
Queuing Penalty (veh)					61		
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	38	5	5	39	3		
Queuing Penalty (veh)	26	3	4	28	31		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	527	525	344	177	180	85	217	125	218	125
Average Queue (ft)	274	330	132	108	108	25	77	118	190	87
95th Queue (ft)	495	513	254	160	166	62	164	155	204	170
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)	0	1	0						68	
Queuing Penalty (veh)	3	4	0						0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								5	68	0
Queuing Penalty (veh)								21	253	2

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	172	120	134	167	238	410	456	334	125	326	125
Average Queue (ft)	72	51	79	96	72	146	276	51	89	301	67
95th Queue (ft)	131	109	123	143	162	336	487	199	171	315	163
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	1	0		62	
Queuing Penalty (veh)						0	6	1		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	58	0
Queuing Penalty (veh)									6	383	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	231	146	178	194	65	224	448	463	484	470	325	144
Average Queue (ft)	87	41	81	90	20	108	230	351	430	413	131	68
95th Queue (ft)	177	102	143	149	51	215	424	555	527	548	354	132
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							1	10	58	48		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	7			22	0	1
Queuing Penalty (veh)						1	9			17	0	4

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	241	124	129	163
Average Queue (ft)	112	38	34	72
95th Queue (ft)	202	86	81	139
Link Distance (ft)	231		201	
Upstream Blk Time (%)	0		0	
Queuing Penalty (veh)	0		0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	7			1
Queuing Penalty (veh)	7			1

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	R
Maximum Queue (ft)	61	547	34	4	28	22	295	52
Average Queue (ft)	2	180	5	0	3	1	93	2
95th Queue (ft)	27	590	24	3	16	10	262	23
Link Distance (ft)		708		791	335		411	
Upstream Blk Time (%)		0					1	
Queuing Penalty (veh)		1					0	
Storage Bay Dist (ft)	100		100			50		50
Storage Blk Time (%)		25				0	46	0
Queuing Penalty (veh)		0				0	3	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	473	470	250	184	350	119	155	440	325	174	396
Average Queue (ft)	170	435	433	244	50	202	59	144	285	201	131	147
95th Queue (ft)	209	482	493	298	137	313	100	183	494	401	198	318
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		72	71						18			0
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	8	92	84	1		17		55	5	1	24	0
Queuing Penalty (veh)	29	153	248	4		9		199	21	4	33	1

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	321	120
Average Queue (ft)	88	46
95th Queue (ft)	229	88
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2230

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	80	8	239	76
Average Queue (ft)	24	0	100	47
95th Queue (ft)	60	3	222	86
Link Distance (ft)		234	204	
Upstream Blk Time (%)			17	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			31	3
Queuing Penalty (veh)			42	9

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	92	165	55	89	118	75
Average Queue (ft)	45	43	27	52	48	43
95th Queue (ft)	76	119	49	79	87	71
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)		1			3	2
Queuing Penalty (veh)		2			4	4

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	18	78	64	91
Average Queue (ft)	1	34	18	41
95th Queue (ft)	8	66	48	70
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	121	484	33	332	353	151	83
Average Queue (ft)	58	188	4	169	184	68	38
95th Queue (ft)	106	375	21	301	323	122	72
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		0		0	0		
Queuing Penalty (veh)		0		0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	61	114	22	55	74	134	163	33	214	446	296
Average Queue (ft)	21	49	2	16	27	56	77	6	42	210	50
95th Queue (ft)	50	88	11	40	58	111	134	25	133	400	195
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)										1	0
Queuing Penalty (veh)										7	1
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)										9	
Queuing Penalty (veh)										5	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	156	174	377	386	351	346	202	171	197	124	271	404
Average Queue (ft)	44	124	277	331	197	211	95	80	106	44	125	235
95th Queue (ft)	132	203	418	429	308	310	167	145	180	106	219	381
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)			12	29								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	0	3	24							0	15	14
Queuing Penalty (veh)	0	5	49							0	6	65

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	76	63	662	675	882	367	39
Average Queue (ft)	74	56	619	642	449	52	7
95th Queue (ft)	78	73	735	718	1046	210	24
Link Distance (ft)					860	860	
Upstream Blk Time (%)					2		
Queuing Penalty (veh)					10		
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	47	11	2	12	1		
Queuing Penalty (veh)	47	11	3	14	19		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	395	443	402	226	249	244	329	124	218	125
Average Queue (ft)	196	252	236	140	145	59	121	85	190	96
95th Queue (ft)	323	383	347	204	218	156	238	169	203	169
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)	0	0	0				0		73	
Queuing Penalty (veh)	0	1	1				3		0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								1	72	1
Queuing Penalty (veh)								7	260	7

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	161	156	260	278	275	394	440	286	125	325	125
Average Queue (ft)	82	49	119	138	151	202	275	135	76	300	41
95th Queue (ft)	142	114	195	217	246	326	388	248	168	313	128
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	0	0		65	
Queuing Penalty (veh)						0	1	0		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	62	0
Queuing Penalty (veh)									12	463	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	328	94	128	141	75	225	451	454	482	476	325	144
Average Queue (ft)	192	23	68	86	19	155	338	378	452	452	216	144
95th Queue (ft)	295	73	114	133	48	274	475	488	470	470	425	147
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							3	5	54	51		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						1	35			33	0	69
Queuing Penalty (veh)						3	64			63	1	239

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	276	193	227	175
Average Queue (ft)	250	69	115	143
95th Queue (ft)	265	150	253	202
Link Distance (ft)	231		201	
Upstream Blk Time (%)	75	0	5	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	19	0	0	12
Queuing Penalty (veh)	76	0	0	22

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	LT	R	LT	R
Maximum Queue (ft)	30	34	29	28	29	166	58
Average Queue (ft)	3	1	5	3	1	59	7
95th Queue (ft)	18	25	22	18	12	148	41
Link Distance (ft)		708		335		411	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		100		50		50
Storage Blk Time (%)		0			0	33	0
Queuing Penalty (veh)		0			0	2	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	471	472	250	184	327	80	152	216	129	174	366
Average Queue (ft)	162	435	431	233	84	201	37	88	67	34	144	129
95th Queue (ft)	227	500	507	326	177	312	66	147	139	84	199	315
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		74	77									1
Queuing Penalty (veh)		0	0									0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	9	94	86	1	0	17		4	1		20	0
Queuing Penalty (veh)	28	124	202	3	0	16		10	2		19	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	298	55
Average Queue (ft)	64	30
95th Queue (ft)	201	52
Link Distance (ft)	452	452
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1932

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	52	279	229	66
Average Queue (ft)	15	100	160	15
95th Queue (ft)	46	285	269	55
Link Distance (ft)		234	204	
Upstream Blk Time (%)		27	48	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			67	0
Queuing Penalty (veh)			19	0

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	183	136	304	729	170	75
Average Queue (ft)	43	19	34	423	100	59
95th Queue (ft)	109	77	170	952	186	85
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)	0			41	55	
Queuing Penalty (veh)	0			178	0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)	0	0		55	2	59
Queuing Penalty (veh)	0	1		13	4	45

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	198	160	358	104	141
Average Queue (ft)	46	113	213	34	53
95th Queue (ft)	172	201	489	75	111
Link Distance (ft)	187		340	1067	1067
Upstream Blk Time (%)	8		46		
Queuing Penalty (veh)	0		291		
Storage Bay Dist (ft)		135			
Storage Blk Time (%)		57	1		
Queuing Penalty (veh)		200	3		

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	638	832	222	444	459	1095	1082
Average Queue (ft)	57	766	109	408	418	960	566
95th Queue (ft)	235	986	232	497	489	1305	1326
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		37	8	15	20	56	19
Queuing Penalty (veh)		252	0	118	158	94	32
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	150	403	391	369	274	694	717	275	245	470	470
Average Queue (ft)	55	359	262	81	94	379	406	93	124	439	233
95th Queue (ft)	111	474	552	242	279	736	767	298	312	467	568
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)		79	48	0						49	8
Queuing Penalty (veh)		0	0	0						388	62
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)					0	39	49	0	0	77	
Queuing Penalty (veh)					0	24	20	0	0	80	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	162	175	398	402	197	224	172	100	134	124	865	946
Average Queue (ft)	62	137	340	364	102	119	76	45	60	34	283	907
95th Queue (ft)	159	207	463	445	177	197	139	86	111	100	761	928
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)			30	72							0	99
Queuing Penalty (veh)			0	0							0	0
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	0	6	35							0	16	5
Queuing Penalty (veh)	1	12	68							0	7	38

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	76	64	662	675	889	358	23
Average Queue (ft)	75	58	659	673	859	26	3
95th Queue (ft)	76	74	710	695	1032	183	13
Link Distance (ft)					860	860	
Upstream Blk Time (%)					33	0	
Queuing Penalty (veh)					289	0	
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	70	11	8	61	3		
Queuing Penalty (veh)	82	12	8	61	40		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	565	550	507	337	354	96	252	124	213	125
Average Queue (ft)	492	520	188	230	245	28	110	99	189	66
95th Queue (ft)	618	564	368	354	367	73	188	171	201	155
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)	6	13	0		0				73	
Queuing Penalty (veh)	49	111	1		1				0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)				0	1			5	72	0
Queuing Penalty (veh)				1	6			33	395	2

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	197	177	238	243	255	407	473	288	125	323	125
Average Queue (ft)	99	56	161	170	137	229	365	115	64	299	61
95th Queue (ft)	169	127	217	217	235	397	476	239	157	311	154
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	1			64	
Queuing Penalty (veh)						0	7			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)		0							0	61	0
Queuing Penalty (veh)		0							0	526	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	242	207	275	296	154	225	463	469	483	480	325	145
Average Queue (ft)	138	102	142	148	59	162	297	393	454	453	123	144
95th Queue (ft)	227	166	208	218	118	263	499	540	468	465	343	146
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							4	12	72	61		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						5	16			30	0	62
Queuing Penalty (veh)						26	45			30	0	243

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	282	169	220	174
Average Queue (ft)	248	56	61	112
95th Queue (ft)	261	122	168	185
Link Distance (ft)	231		201	
Upstream Blk Time (%)	75	0	1	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	28		0	4
Queuing Penalty (veh)	109		1	7

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	LT	R	LT	R
Maximum Queue (ft)	37	724	23	14	23	412	45
Average Queue (ft)	1	636	3	1	1	292	3
95th Queue (ft)	19	972	15	9	8	503	25
Link Distance (ft)		708		335		411	
Upstream Blk Time (%)		23				40	
Queuing Penalty (veh)		294				0	
Storage Bay Dist (ft)	100		100		50		50
Storage Blk Time (%)		76			0	96	0
Queuing Penalty (veh)		2			0	6	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	465	460	250	185	444	171	155	422	323	175	498
Average Queue (ft)	136	439	438	217	103	226	61	142	249	188	173	452
95th Queue (ft)	250	455	456	356	193	393	123	181	415	334	178	551
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		85	84						3			85
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	2	98	95	1	0	16		24	25	1	94	1
Queuing Penalty (veh)	9	162	280	2	3	25		115	126	6	128	2

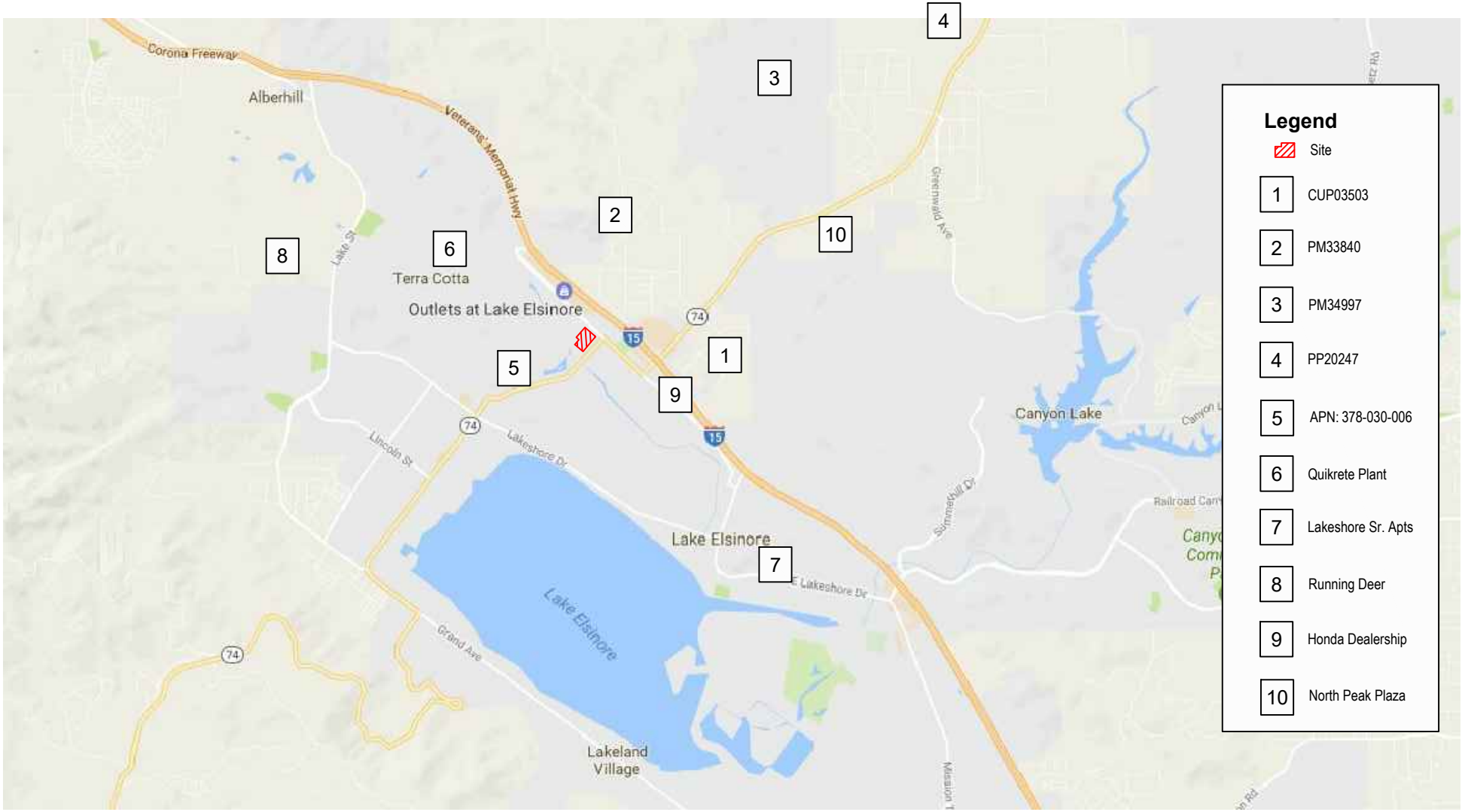
Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	443	76
Average Queue (ft)	126	22
95th Queue (ft)	408	63
Link Distance (ft)	452	452
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 5355

Appendix D: Cumulative Projects Data



Source: Google Maps, 10/2016

Remaining Cumulative Projects Location Map

FIGURE
A

Kassab Travel Center TIA

Project Number	City / County	Project Name	Location	Land Use	Quantity	Units[1]
1	Lake Elsinore	Greenwald	APN 349-290-009. Approximately 200 feet northeast of the intersection of Greenwald and Bella Vista.	Shopping Center	104.450	TSF
2	Lake Elsinore	Ramsgate	1,300 Acre project area. Project is bounded by Riverside Street to the north, La Strada to the South, Greenwald to the east, and Highway 74 to the west.	Single Family Residential	1306.00	DU
				Condos/Townhomes	120.00	DU
3	Lake Elsinore	Trieste (Tract 36624)	Located at Rosetta Canyon Drive, south of Highway 74. APN: 347-120-047-8	Single Family Residential	75	DU
4	Lake Elsinore	Spyglass Ranch	APN's: 377-250-011, 377-350-004, 007, 008, 010, 014, 015, 016, 017, 377-260-004, 005, 006.	Single Family	523	DU
				Condominiums	171	DU
				Shopping Center	145.000	TSF
5	Lake Elsinore	South Shore I (Tract 31593)	Directly west of South Shore II	Single Family	521	DU
		South Shore II (Tract 36567)	East side of I-15 from Main Street adjacent to and east of TTM 35337. APNs: 363-020-012, 363-020-013, 363-020-014, 363-020-014, 363-020-015, 363-020-018, 363-020-002 and 363-020-003	Single Family	400	DU
6	Lake Elsinore	La Strada (Tract 32077)	Aproximately 1,500 feet east of the intersection of La Strada and Summerhill	Single Family	134	DU
7	Lake Elsinore	Marina Village Condos (Tract: 33820).	Spring St.and Lakeshore Dr. APN: 374-271-007,004,013,015,003.	Condominiums	94	DU
8	Lake Elsinore	TAG Property	APN: 363-130-086. Approximately 1,500 feet northwest of the intersection of Diamond and Auto Center.	Car Dealership	50.000	TSF
9	Lake Elsinore	City Center Condos	southeast quadrant ofl-15, Railroad Canyon and Grape	Condominiums	144	DU
10	Lake Elsinore	Diamond Specific Plan	The Project Site consists of 87.2 acres in the southeast portion of the city, generally located along Diamond Drive between Lakeshore Drive and a point approximately 600 feet south of Malaga Road	Condominiums	600	DU
				Hotel	150	RM
				General Office	425.000	TSF
				Shopping Center	472.000	TSF
11	Lake Elsinore	The Colony	East Lake is located in the City of Lake Elsinore along the eastern shore of Lake Elsinore	Apartments	211	DU
		TAG Property		Single Family	2407	DU
				Condominiums	324	DU
		John Laing Homes (Phase 2)		Single Family	506	DU
				Condominiums	1141	DU
				Apartments	308	DU
				Shopping Center	117.000	TSF
12	Lake Elsinore	Lake Elsinore Walmart	Southeast corner of Central and Cambern Avenues. APN's: 377-030-015 & -076 and 377-090-009, & -029 through -032.	Retail	151.397	TSF
				Speciality Retail	5.300	TSF
				Fast-Food without Drive-Thru	5.300	TSF
				Fast-Food without Drive-Thru	6.800	TSF

Project Number	City / County	Project Name	Location	Land Use	Quantity	Units[1]
13	Lake Elsinore	Summerly	East Lake is located in the City of Lake Elsinore along the eastern shore of Lake Elsinore	Single Family	142	DU
14	Lake Elsinore	Beazer		Single Family	72	DU
		KB Homes		Single Family	106	DU
		McMillin Homes		Single Family	143	DU
		Richmond American		Single Family	74	DU
15	Lake Elsinore	Lakeshore Town Center	Located at the northwest corner of Lakeshore Drive and Main Street and is located on Lake Elsinore (APNs: 374-281-001, 002, 003, 004, 005, 006, 007, 008, 009, and 010/374-282-001, 002, 003, and 004/373-162-001, 002, 003, 004, and 005).	Mixed-Use Commercial	237.400	TSF
16	Lake Elsinore	Canyon Hills Estates	APN: 365-220-026; 365-230-001, 005 thru 007, 009 thru 013	Single Family	302	DU
17	Lake Elsinore	Canyon Hills	Generally located east of the intersection of Railroad Canyon and Canyon Hills	Single Family	2700	DU
				Apartments	1575	DU
				Single Family	1003	DU
18	Lake Elsinore	Alberhill Ridge	APN's: 389-020-035 & 036, 389-080-040, 390-130-026 & 028, 390-160-003 & 006, 390-190-013, 014 & 015, 390-200-008 & 010, 390-210-021	Single Family	1056	DU
				Apartments	345	DU
				Shopping Center	679.000	TSF
				General Office	679.000	TSF
19	Lake Elsinore	Alberhill Ranch	APN: 391-800-001, 391-230-009, 391-240-001, 389-020-063, 390-130-021, 390-160-012, 390-190-019, 391-200-012, 391-230-005, 390-170-001, 390-160-001, 390-160-002-390-190-011, 391-230-002, 391-200-007, 391-230-002, 391-200-004, 391-230-004, 390-130-020, 390-130-006, 391-170-005, 391-170-007,391-200-010, 391-200-003, 391-230-010	Single Family	1986	DU
20	Lake Elsinore	Terracina	APNs: 378-040-004, 378-040-005, 378-040-006, 378-040-012, 378-040-012, 389-040-012, 389-180-002, 389-190-002.	Single Family	365	DU
21	Lake Elsinore	Wakerider	APN: 381-030-005	Resort	11.350	TSF
22	Lake Elsinore	Village at Lakeshore (Tract 33267)	APNs:387-180-001, 387-170-004, 387-170-006, 387-080-003, 387-080-004, 379-050-034, 379-050-006.	Condominiums	163	DU
23	Lake Elsinore	Golden Corral	APN: 377-080-059, 377-080-078, 377-080-082	Restaurant	7.798	TSF
24	Lake Elsinore	Circle K	APN: 379-132-013.	Gas Station	4.500	TSF
			Assessor's Parcel Numbers (APNs): 389-020-032, 390-130-006, 390-130-015, 390-130-016, 390-130-017, 390-130-020, 390-130-021, 390-130-024, 390-160-001, 390-160-002, 390-160-011, 390-160-012, 390-170-001, 390-190-011, 390-190-019,	Single Family Residential	8,244	DU
				Non-Residential	4,007.00	TSF

Project Number	City / County	Project Name	Location	Land Use	Quantity	Units[1]
25	Lake Elsinore	Alberhill Villages	391-170-005, 391-170-007, 391-200-003, 391-200-004, 391-200-007, 391-200-010, 391-200-011, 391-200-012, 391-200-017, 391-230-002, 391-230-003, 391-230-004, 391-230-005, 391-230-007, 391-230-009, 391-230-010, 391-240-001, 391-800-011.	University or similar use	6,000	STU
26	Lake Elsinore	Ness Industrial Garage	APN: 377-430-060	Light Industrual	12.000	TSF
27	Lake Elsinore	Fairway Business Park	APN: 377-140-124	Heavy Industrial		
28	Lake Elsinore	La Quinta Inn	APN: 377-090-036	Hotel	64	RM
29	Lake Elsinore	LE Sports Complex	APN: 373-210-378, 389,390, 433 363-161-035-2, 363-161-034-1 363-161-033-0, 363-161-032-9 363-161-031-8, 363-161-030-7, 363-161-029-7, 363-161-032 450	Recreational	525	TSF
30	Lake Elsinore	Central and Collier	APN: 377-080-014; 031; 032; 033; 034;	Commercial	75	TSF
31	Lake Elsinore	Artisan Alley	APN: 365-280-022 & 373-210-041	Commercial	95.1	TSF
32	Lake Elsinore	Quikrete Plant	APN: 378-020-014, 015, & 016	Commercial	163.9	TSF
33	Lake Elsinore	Lakeshore Senior Apartments	APN: 373-176-019, 373-185-022, 023, 036, 037, 038, 046, 024	Apartments	121	DU
34	Lake Elsinore	Southshore (TR 31593)	350-003, 018, 347-360-004 thru 010, and 013	Single Family Residential	521	DU
35	Lake Elsinore	Running Deer (TR 31957)	APN: 391-790-002 & 003	Single Family Residential	101	DU
36	Lake Elsinore	Lakeview Manor	APN: 379-230-001	Condominiums	104	DU
37	Lake Elsinore	Tige Watersports	APN: 378-030-031	Boat dealership	34.5	TSF
38	Lake Elsinore	Kassab Travel Center	APN: 378-030-007 & 009	Gas Station, resturants	17.2	TSF
39	Lake Elsinore	Honda	APN: 377-080-053, 057, 079	Honda dealership	53.4	TSF
40	Lake Elsinore	North Peak Plaza	APN: 347-110-048, 057, 059, 070, 077, and 089	Mixed-Use Commercial	92	TSF

1. TSF= Thousand Square Feet; DU= Dwelling Unit; AC = Acres; STU = Student; RM= Rooms.

APPENDIX G

Traffic Impact Assessment Scoping Agreement

DRAFT

ALBERT WILSON & ASSOCIATES

TRAFFIC ENGINEERS

SCOPING AGREEMENT

FOR

PROPOSED BOAT SALE AND MANUFACTURING FACILITY ON RIVERSIDE DRIVE (APN: 378-030-006)

CITY OF LAKE ELSINORE CA.

Revised June 30, 2017

7866 Henbane Street, Rancho Cucamonga Ca. 91739, Phone:909-483-4876; Fax: 909-989-1576; www.awatraffic.com

TABLE OF CONTENT

- Traffic Impact Study Scoping Agreement
- Trip Generation
- Site Plan
- Trip Distribution

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the Riverside County Transportation Department requirements for traffic impact analysis of the following project. The analysis must follow the Riverside County Transportation Department Traffic Study Guidelines dated February 2005.

Case No. 2016-113
Related Cases -
SP No. *Provide SP No. and list of other approved or active projects within the SP.*
EIR No.
GPA No.
CZ No.
Project Name: Tige Watersports Boat Sales & Manufacturing
Project Address: Riverside Drive (APN: 378-030-006)
Project Description: Boat Manufacturing and Sales Facility

	Consultant	Developer
Name:	Albert Wilson & Associates	Tige Watersports
Address:	7866 Henbane Street	29400 Enterprise Way
	Rancho Cucamonga, Ca. 91739	Lake Elsinore Ca. 92530
Telephone:	909-483-4876	951-245-1222
Fax:	909-989-1576	

A. Trip Generation Source: (ITE 7th Edition or other) ITE 9TH EDITION

Current GP Land Use *Provide General Plan Land Use Designation (e.g.: MDR, CR, etc)* LIMITED INDUSTRIAL
Proposed Land Use
Current Zoning CM
Proposed Zoning CM

Current Trip Generation	In	Out	Total	Proposed Trip Generation In	Out	Total
AM Trips	0	0	0	21	6	27
PM Trips	0	0	0	10	17	27

Internal Trip Allowance ☐ Yes ☒ No (_____ % Trip Discount)
Pass-By Trip Allowance ☐ Yes ☒ No (_____ % Trip Discount)

A passby trip discount of 25% is allowed for appropriate land uses. The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: N 10% S 20% E25% W45%
(attach exhibit for detailed assignment)

C. Background Traffic

Project Build-out Year: 2019 Annual Ambient Growth Rate: 2%
time needed for approvals and construction.
Phase Year(s) NA
Other area projects to be analyzed:

Model/Forecast methodology RELATIVE ADT FACTOR

Exhibit B – Scoping Agreement – Page 2

D. Study intersections: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. NON
2.
3.
4.
5.
6.
7.
8.
9.
10.

E. Study Roadway Segments: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. NON
2.
3.
4.
5.
6.
7.
8.
9.
10.

E. Other Jurisdictional Impacts

Is this project within a City's Sphere of Influence or one-mile radius of City boundaries? ☐ Yes ☒ No

If so, name of City Jurisdiction: _____

F. Site Plan (please attach reduced copy) ATTACHED

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Transportation Department)
(NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing unsignalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

_____

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.
Date of counts _____

***NOTE* Traffic Study Submittal Form and appropriate fee must be submitted with, or prior to submittal of this form. Transportation Department staff will not process the Scoping Agreement prior to receipt of the fee.**

Recommended by:

CHIDI ONUMONU — 6-30-17
Consultant's Representative — Date

Scoping Agreement Submitted on 5-31-17

Revised on 6-30-17

Approved Scoping Agreement:

[signature] — 7/6/2017
Date

Nicholas Lowe, PE
City Traffic Engineer
• TIA Not Required due to volumes.

TABLE 1:

PROJECT TRIP GENERATION- Boat Manufacturing/Sales Facility

LAND USE	UNITS	A.M. PEAK HOUR			P.M. PEAK HOUR			DAILY		
		IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
PHASE !: Land Use 140- Manufacturing	25.682 TSF									
Trips/Unit		0.57	0.16	0.73	0.26	0.47	0.73	1.91	1.91	3.82
Trips		15	4	19	7	12	19	49	49	98
PHASE 2: Land Use 140- Manafacturing	9.8 TSF	0.57 6	0.16 2	0.73 8	0.26 3	0.47 5	0.73 8	1.91 19	1.91 19	3.82 38
Total New Trips		21	6	27	10	17	27	68	68	136

SUMMARY

EXHIBIT A - LEGAL DESCRIPTION

PORTION OF LOT A IN BLOCK "A" OF RANCHO LA LAGUNA MAP IN BOOK 6 PAGE 377 OF MAPS, SAN DIEGO COUNTY RECORDS, ALSO RECORD OF SURVEY BOOK 74 - PAGE 63, RIVERSIDE COUNTY RECORDS, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

GENERAL INFORMATION

APN NUMBER	379-030-008
TOTAL NET / GROSS LOT AREA	25.76 AC
TOTAL BUILDING AREA	25,682 SF
TOTAL BUILDING COVERAGE	21.2%
TOTAL PAVING AREA	44,142 SF
TOTAL PAVING COVERAGE	12.2%
TOTAL LANDSCAPING AREA	18,488 SF
TOTAL LANDSCAPING COVERAGE	18.2%
EXISTING ZONING	CM
PROPOSED ZONING	CM
TYPE OF CONSTRUCTION	VB
SPRINKLERED OCCUPANCY CLASS	S, S1, F1
DESCRIPTION OF USE: BOAT ENGINEERING, SERVICE, MANUFACTURING	
STORY	1 STORY
HEIGHT	30'-0"
TOTAL PARKING REQUIRED	88 SPACES
TOTAL HC ACCESSIBLE PARKING REQUIRED	3 SPACES
TOTAL PARKING SHOWN	81 SPACES
TOTAL HC ACCESSIBLE PARKING SHOWN	3 SPACES

ALLOWABLE BUILDING AREA

PER CBC TABLE 503: ALLOWABLE BUILDING AREA AND CALCULATION

OCCUPANCY GROUP	S, S1, F1
TYPE OF CONSTRUCTION	TYPE VB
BASIC ALLOWABLE	AT = 9,000 SF
INCREASE FOR SPRINKLER	IS = 3
TOTAL ALLOWABLE BUILDING AREA	AA = AT + (AT X IS) = 9000 + (9000 X 3) = 36,000 SF

UTILITY PURVEYORS

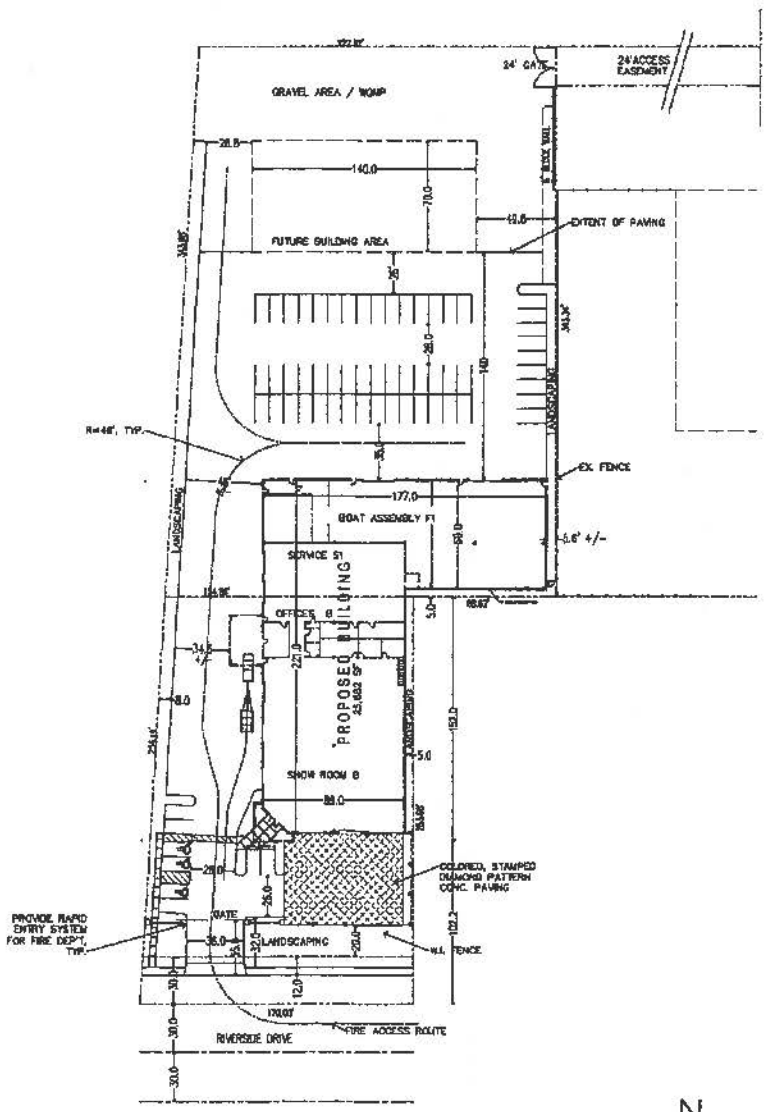
WATER	ELSINORE VALLEY MUNICIPAL WATER DISTRICT, 31,315 CHANEY ST. LAKE ELSINORE, CA 92531 (951) 674-3146
SEWER	ELSINORE VALLEY MUNICIPAL WATER DISTRICT, 31,315 CHANEY ST. LAKE ELSINORE, CA 92531 (951) 674-3146
GAS	SOUTHERN CALIFORNIA GAS COMPANY, P.O. BOX 3003 BEELANDS, CA 92373, (800) 335-7925
TELEPHONE	VERIZON, 120 E. THIRD STREET PERRIS, CA 92570 (951) 657-7612
ELECTRIC	SOUTHERN CALIFORNIA EDISON COMPANY, 26100 MENIFEE RD. ROMOLAND, CA 92380, (951) 636-8523

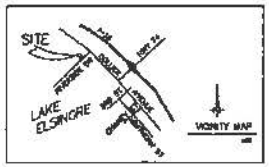
GOVERNING CODES

ALL CODE REFERENCES ARE TO BE IN COMPLIANCE WITH TITLE 24, 2010 EDITION

- PART 1, CALIFORNIA ADMINISTRATION CODE (CAC)
- PART 2, CALIFORNIA BUILDING CODE (CBC)
- PART 3, CALIFORNIA ELECTRICAL CODE (CEC)
- PART 4, CALIFORNIA MECHANICAL CODE (CMC)
- PART 5, CALIFORNIA PLUMBING CODE (CPC)
- PART 6, CALIFORNIA ENERGY EFFICIENCY STANDARDS (CEES)
- PART 9, CALIFORNIA FIRE CODE (CFC)
- PART 11, CALIFORNIA GREEN BUILDING STANDARDS CODE

ALL CODES SHALL INCLUDE LOCAL AMENDMENTS





SITE PLAN / WALL AND FENCE PLAN

FLOOR AREA: 25,682 SF

SCALE: 1"=30'-0"

0 10 20 40 60

EXHIBIT 1

ISSUED

rieger associates
architecture, engineering
40440 Carmelita Circle
Temecula, California 92591
Phone: 951-678-3759

PROJECT NAME: PROTOCOL NEW BUILDING OF tige Watersports

DATE: OCT 20-6
SCALE:
DRAWN:
CHECK:
JOB NO.: 672

C1

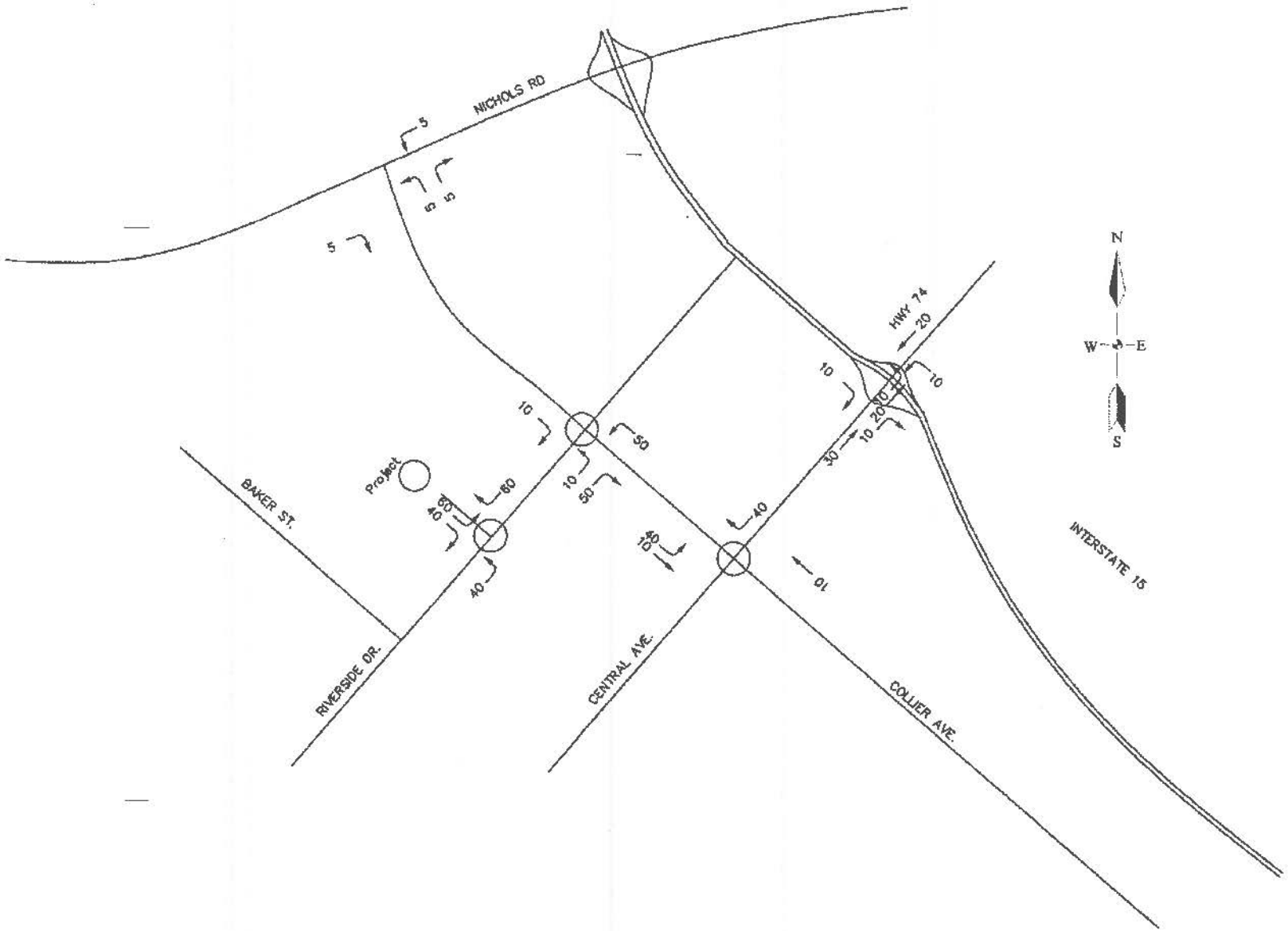


EXHIBIT 2: PROJECT TRIP DISTRIBUTION %

CENTRAL PLAZA
TRAFFIC IMPACT STUDY
City of Lake Elsinore, California
(Updated 2/9/2017)

Prepared for:

PENINSULA RETAIL PARTNERS, LLC.
417 29th Street
Newport Beach, CA 92663

Prepared by:

RK ENGINEERING GROUP, INC.
4000 Westerly Place, Suite 280
Newport Beach, CA 92660

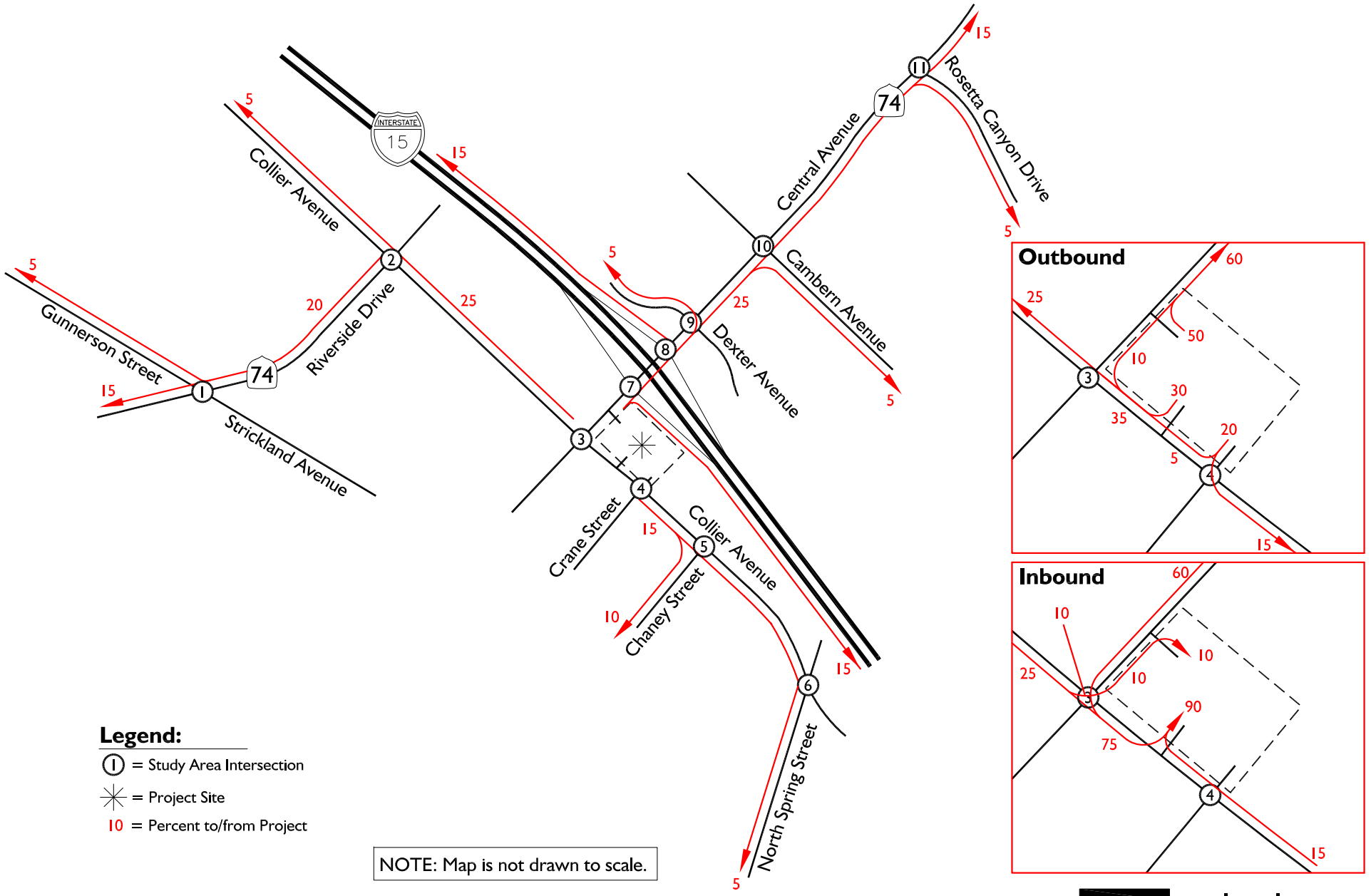
Mohammad "Alex" Tabrizi, PE, TE
Alex Vu, EIT
Jethro Narciso, EIT

February 9, 2017

AT:dt/RK11545.doc
JN:1447-2015-01

Exhibit 5-1

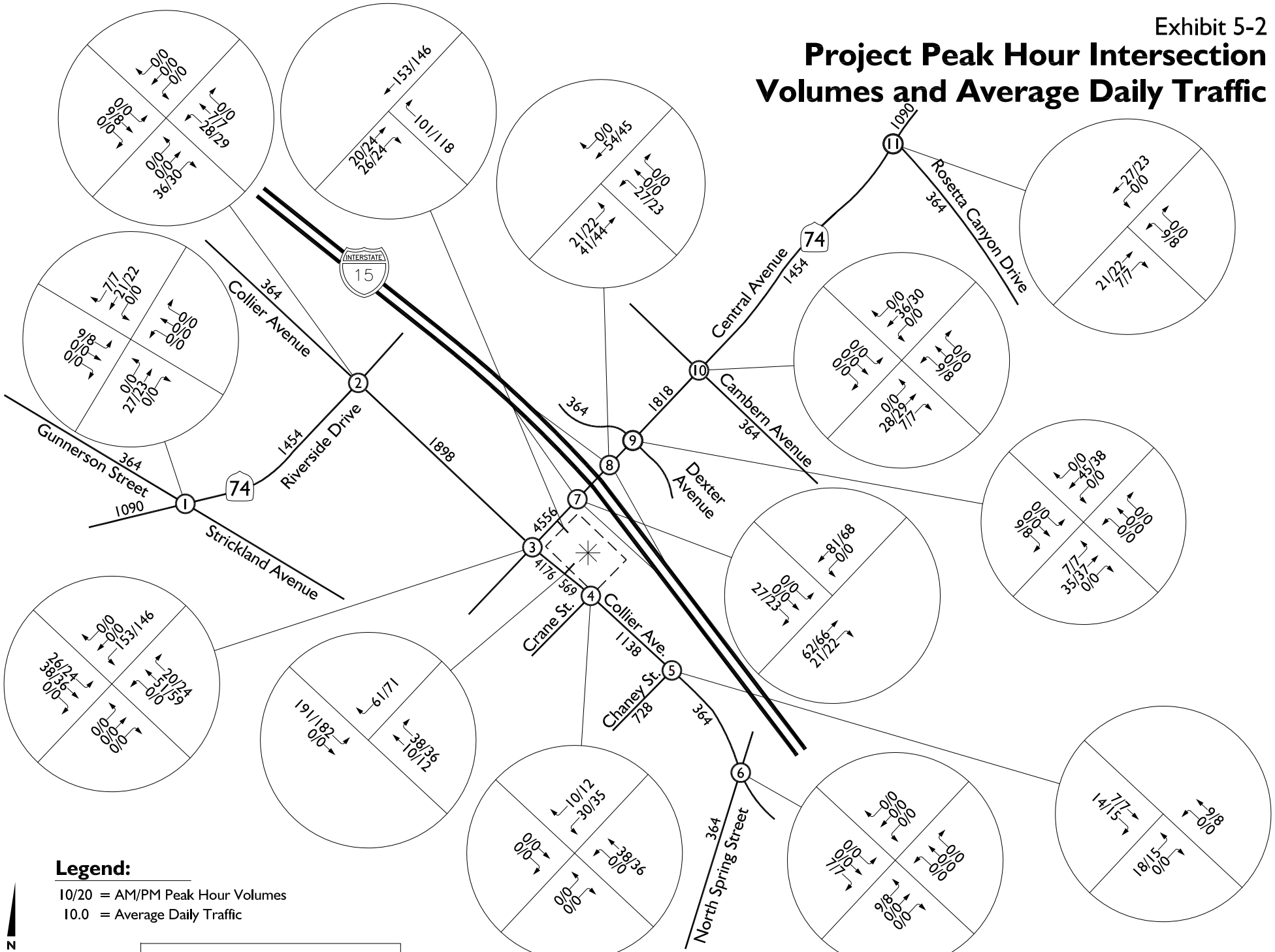
Project Trip Distribution



RK engineering group, inc.

Exhibit 5-2

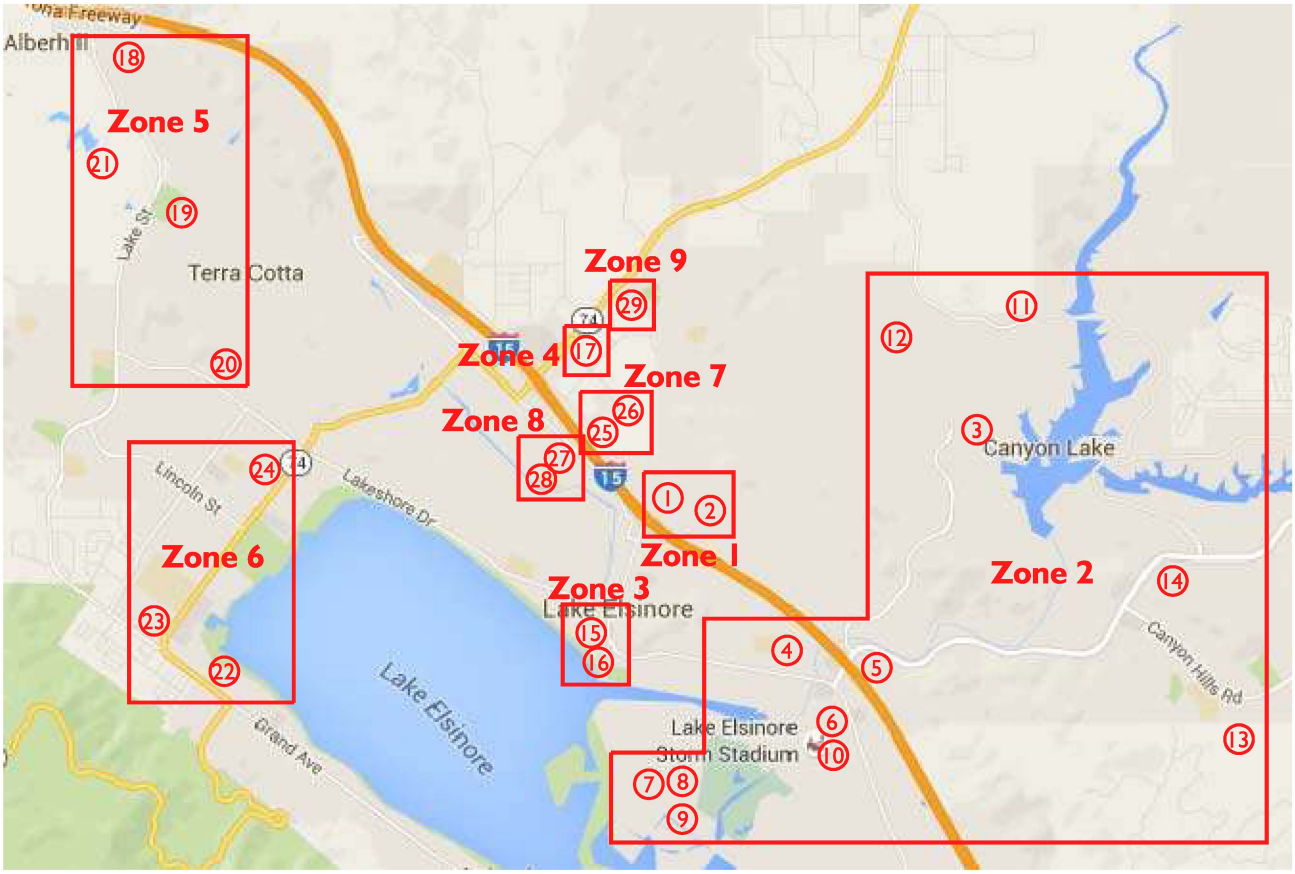
Project Peak Hour Intersection Volumes and Average Daily Traffic



RK engineering group, inc.

Exhibit 5-4

Cumulative Projects Location Map



Zone 1:

(1) = LE4 - Spyglass Ranch
(2) = LE5 - South Shore I & II

Zone 2:

(3) = LE6 - La Strada
(4) = LE8 - TAG Property
(5) = LE9 - City Center Condos
(6) = LE10 - Diamond Specific Plan
(7) = LE11 - The Colony, TAG Property, John Laing Homes (Phase 2)
(8) = LE13 - Summerly
(9) = LE14 - Beazer, KB Homes, McMillin Homes, Richmond American
(10) = LE29 - LE Sports Complex
(11) = LE1 - Greenwald
(12) = LE2 - Ramsgate
(13) = LE16 - Canyon Hills Estates
(14) = LE17 - Canyon Hills

Zone 3:

(15) = LE7 - Marina Village Condos
(16) = LE15 - Lakeshore Town Center

Zone 4:

(17) = LE4 - Lake Elsinore Walmart

Zone 5:

(18) = LE18 - Alberhill Ridge
(19) = LE19 - Alberhill Ranch
(20) = LE20 - Terracina
(21) = LE25 - Alberhill Villages

Zone 6:

(22) = LE21 - Wakerider
(23) = LE22 - Village at Lakeshore (Tract 33267)
(24) = LE24 - Circle K

Zone 7:

(25) = LE23 - Golden Corral
(26) = LE28 - La Quinta Inn

Zone 8:

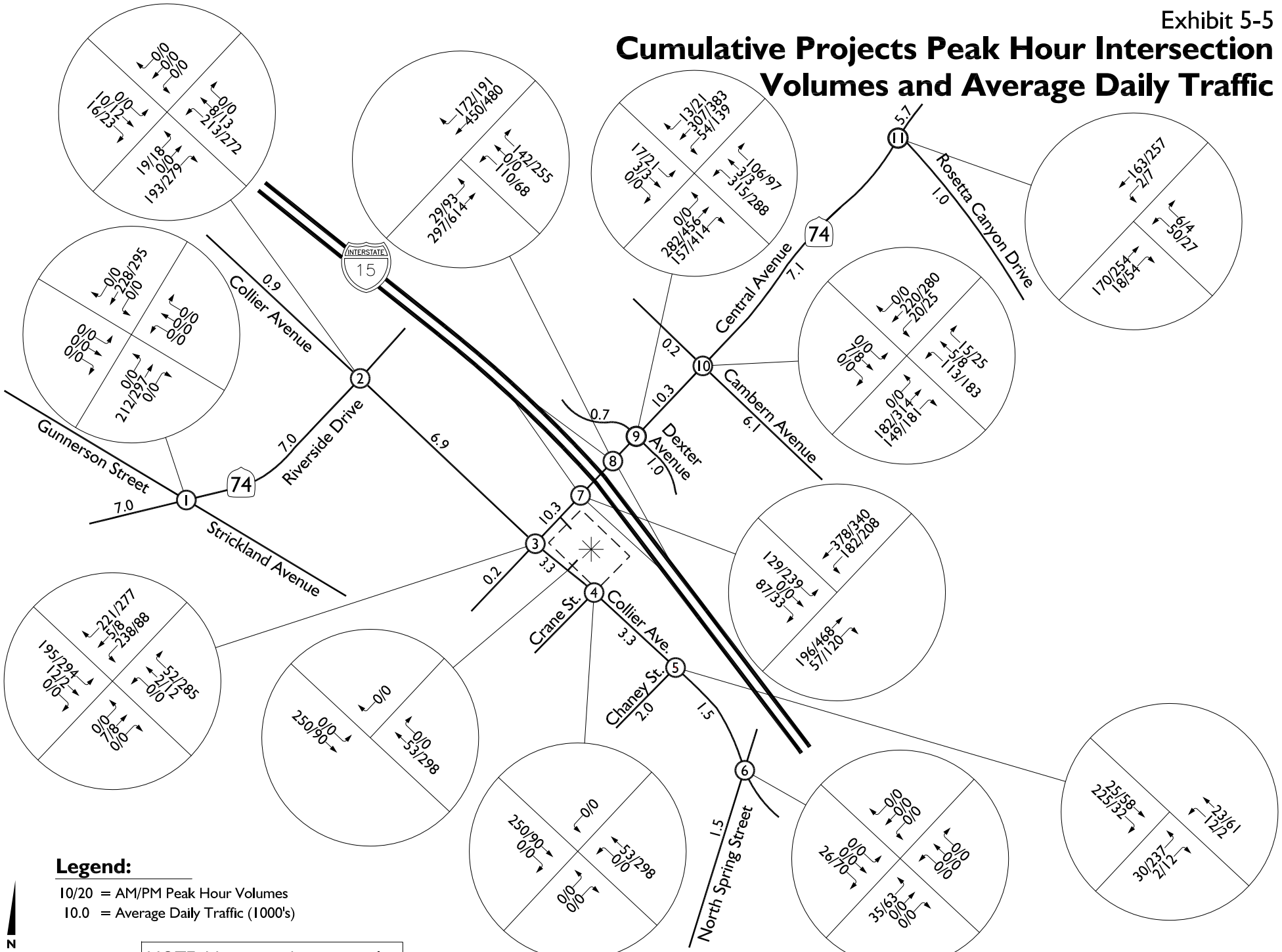
(27) = LE26 - Ness Industrial Garage
(28) = LE27 - Fairway Business Park

Zone 9:

(29) = LE3 - Trieste (Tract 36624)

Exhibit 5-5

Cumulative Projects Peak Hour Intersection Volumes and Average Daily Traffic



Legend:

10/20 = AM/PM Peak Hour Volumes

10.0 = Average Daily Traffic (1000's)

N

NOTE: Map is not drawn to scale.

TABLE 5-1
Trip Generation Rates for Proposed Project

Land Use	ITE Trip Code	Units[2]	Weekday						
			AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Shopping Center	820	TSF	0.60	0.36	0.96	1.78	1.93	3.71	42.70
Fast Food without Drive Thru	933	TSF	26.32	17.55	43.87	13.34	12.81	26.15	716.00
Fast Food with Drive Thru	934	TSF	23.16	22.26	45.42	16.98	15.67	32.65	496.12
High Turnover Sit-Down Restaurant	932	TSF	5.95	4.86	10.81	5.91	3.94	9.85	127.15

[1] Source: Institute of Transportation Engineers (ITE), *Trip Generation, 9th Edition, 2012*

[2] TSF = Thousand Square Feet

TABLE 5-2
Project Trip Generation

Land Use	Quantity	Units	AM			PM			Daily
			In	Out	Total	In	Out	Total	
Shopping Center	53.469	TSF	32	20	52	95	103	198	2,283
Pass-by Adjustment (0% AM & 34% PM) [2]			*0*	*0*	*0*	*-32*	*-35*	*-67*	*-67*
Subtotal - Shopping Center			**32**	**20**	**52**	**63**	**68**	**131**	**2,216**
Fast Food without Drive Thru	3.530	TSF	93	62	155	47	45	92	2,527
Pass-by Adjustment (25% AM & 25% PM) [3]			*-23*	*-16*	*-39*	*-12*	*-11*	*-23*	*-62*
Subtotal - Fast Food without Drive Thru			**70**	**46**	**116**	**35**	**34**	**69**	**2,465**
Fast Food with Drive Thru	4.500	TSF	104	100	204	76	71	147	2,233
Pass-by Adjustment (49% AM 50% PM) [2]			*-51*	*-49*	*-100*	*-38*	*-36*	*-74*	*-174*
Subtotal - Fast Food with Drive Thru			**53**	**51**	**104**	**38**	**35**	**73**	**2,059**
High Turnover Sit-Down Restaurant	4.304	TSF	26	21	47	25	17	42	547
Pass-by Adjustment (0% AM 43% PM) [2]			*0*	*0*	*0*	*-11*	*-7*	*-18*	*-18*
Subtotal - High Turnover Sit-Down Restaurant			**26**	**21**	**47**	**14**	**10**	**24**	**529**
Project Total (before pass-by adjustment)			**255**	**203**	**458**	**243**	**236**	**479**	**7,590**
Project Total (after pass-by adjustment)			***181***	***138***	***319***	***150***	***147***	***297***	***7,269***

[1] TSF = Thousand Square Feet;

[2] Pass-by trip adjustment rates are based on ITE 9th Edition.

[3] Since ITE does not have any pass-by data compiled for this type of land use, this analysis conservatively utilizes a pass-by rate of 25 percent.

TABLE 5-3

Cumulative Projects Trip Generation[2]

Traffic Analysis Zone	#	City of Lake Elsinore Project Number [5]	Project Name	Land Use	Quantity	Units[1]	ITE Code	Peak Hour						Daily
								AM			PM			
								In	Out	Total	In	Out	Total	
1	1	LE 4	Spyglass Ranch	Single Family Residential	523	DU	210	98	294	392	329	194	523	4,979
				Condominiums	171	DU	230	13	62	75	60	29	89	994
				Shopping Center	145.000	TSF	820	86	53	139	258	280	538	6,192
	2	LE 5	South Shore I	Single Family Residential	521	DU	210	98	293	391	328	193	521	4,960
			South Shore II	Single Family Residential	400	DU	210	75	225	300	252	148	400	3,808
							Zone 1 Subtotal	*370*	*927*	*1,297*	*1,227*	*844*	*2,071*	*20,933*
2	3	LE 6	La Strada	Single Family Residential	134	DU	210	25	75	100	84	50	134	1,276
	4	LE 8	TAG Property	Car Dealership	50.000	TSF	841	72	24	96	52	79	131	1,615
	5	LE 9	City Center Condos	Condominiums	144	DU	230	11	53	64	50	25	75	837
	6	LE 10	Diamond Specific Plan	Condominiums	600	DU	230	45	219	264	209	103	312	3,486
				Hotel	150	RM	310	47	33	80	46	44	90	1,226
				General Office	425.000	TSF	710	583	80	663	108	526	634	4,688
				Shopping Center	472.000	TSF	820	281	172	453	841	911	1,752	20,154
	7	LE 11	The Colony	Apartments	211	DU	220	22	86	108	85	46	131	1,403
			TAG Property	Single Family Residential	2407	DU	210	451	1,354	1,805	1,516	891	2,407	22,915
				Condominiums	324	DU	230	24	118	142	113	56	169	1,882
			John Laing Homes (Phase 2)	Single Family Residential	506	DU	210	95	285	380	319	187	506	4,817
				Condominiums	1141	DU	230	85	417	502	398	196	594	6,629
				Apartments	308	DU	220	31	126	157	124	67	191	2,048
				Shopping Center	117.000	TSF	820	70	43	113	208	226	434	4,996
	8	LE 13	Summerly	Single Family Residential	142	DU	210	27	80	107	89	53	142	1,352
	9	LE 14	Beazer	Single Family Residential	72	DU	210	14	41	55	45	27	72	685
			KB Homes	Single Family Residential	106	DU	210	20	60	80	67	39	106	1,009
			McMillin Homes	Single Family Residential	143	DU	210	27	80	107	90	53	143	1,361
			Richmond American	Single Family Residential	74	DU	210	14	42	56	47	27	74	704
	10	LE 29	LE Sports Complex	Recreational	525.000	TSF	495	710	366	1,076	705	734	1,439	17,756
	11	LE 1	Greenwald	Shopping Center	104.450	TSF	820	62	38	100	186	202	388	4,460
	12	LE 2	Ramsgate	Single Family Residential	1306	DU	210	245	735	980	823	483	1,306	12,433
				Condos/Townhomes	120	DU	230	9	44	53	42	21	63	697
	13	LE 16	Canyon Hills Estates	Single Family Residential	302	DU	210	57	170	227	190	112	302	2,875
	14	LE 17	Canyon Hills	Single Family Residential	2700	DU	210	506	1,519	2,025	1,701	999	2,700	25,704
				Apartments	1575	DU	220	161	643	804	635	342	977	10,474
				Single Family Residential	1003	DU	210	188	564	752	632	371	1,003	9,549
							Zone 2 Subtotal	*3,882*	*7,467*	*11,349*	*9,405*	*6,870*	*16,275*	*167,031*
3	15	LE 7	Marina Village Condos	Condominiums	94	DU	230	7	34	41	33	16	49	546
	16	LE 15	Lakeshore Town Center	Mixed-Use Commercial	237.400	TSF	820	141	87	228	423	458	881	10,137
							Zone 3 Subtotal	*148*	*121*	*269*	*456*	*474*	*930*	*10,683*
4	17	LE 12	Lake Elsinore Walmart [5]	Mixed Commercial	170.487	TSF	---	339	256	595	412	417	829	11,723
							Zone 4 Subtotal	*339*	*256*	*595*	*412*	*417*	*829*	*11,723*
5	18	LE 18	Alberhill Ridge	Single Family Residential	1056	DU	210	198	594	792	665	391	1,056	10,053
				Apartments	345	DU	220	35	141	176	139	75	214	2,294
				Shopping Center	679.000	TSF	820	404	248	652	1,209	1,310	2,519	28,993
				General Office	679.000	TSF	710	932	127	1,059	172	840	1,012	7,489
	19	LE 19	Alberhill Ranch	Single Family Residential	1986	DU	210	372	1,117	1,489	1,251	735	1,986	18,907
	20	LE 20	Terracina	Single Family Residential	365	DU	210	68	205	273	230	135	365	3,475
	21	LE 25	Alberhill Villages [3]	All Proposed Land Uses	--	--	--	4,875	5,258	10,133	7,850	7,665	15,515	158,189
							Zone 5 Subtotal	*6,884*	*7,690*	*14,574*	*11,516*	*11,151*	*22,667*	*229,400*
6	22	LE 21	Wakerider [4]	Resort	--	--	--	73	60	133	88	71	159	2,201
	23	LE 22	Village at Lakeshore	Condominiums	163	DU	230	12	60	72	57	28	85	947
	24	LE 24	Circle K	Gas Station/Car Wash	12.000	FP	946	72	70	142	85	81	166	1,834
							Zone 6 Subtotal	*157*	*190*	*347*	*230*	*180*	*410*	*4,982*
7	25	LE 23	Golden Corral	Restaurant	7.798	TSF	932	46	38	84	46	31	77	992
	26	LE 28	La Quinta Inn	Hotel	64	RM	310	20	14	34	20	19	39	523
							Zone 7 Subtotal	*66*	*52*	*118*	*66*	*50*	*116*	*1,515*
8	27	LE 26	Ness Industrial Garage	Light Industrial	12.000	TSF	110	10	1	11	1	10	11	84
	28	LE 27	Fairway Business Park	Light Industrial	280.000	TSF	110	227	31	258	33	239	272	1,952
							Zone 8 Subtotal	*237*	*32*	*269*	*34*	*249*	*283*	*2,036*
9	29	LE 3	Trieste	Single Family Residential	75	DU	210	14	42	56	47	28	75	714
							Zone 9 Subtotal	*14*	*42*	*56*	*47*	*28*	*75*	*714*
							Total Cumulative Project Trip Generation	*12,097*	*16,777*	*28,874*	*23,393*	*20,263*	*43,656*	*449,017*

[1] DU = Dwelling Units; FP = Fueling Positions; RM = Rooms; TSF = Thousand Square Feet

[2] Cumulative project information provided by the City of Lake Elsinore and County of Riverside.

[3] Trip Generation is based on *Alberhill Villages Specific Plan (Linscott, Law & Greenspan Engineers, October 14, 2015).*

[4] Trip Generation is based on *Wakerider Beach Resort Traffic Study (RK Engineering Group, Inc., May 27, 2015)* .

[5] Trip Generation is based on *Lake Elsinore Walmart Traffic Impact Analysis (Urban Crossroads, Inc., June 11, 2015)* .

[6] Project number from City of Lake Elsinore-provided cumulative project list.

TRAFFIC IMPACT ANALYSIS REPORT

MISSION TRAIL APARTMENTS PROJECT

Lake Elsinore, California
March 22, 2017
(Update to the February 23, 2017 Report)

Prepared for:
VCS Environmental
30900 Rancho Viejo Road, Suite 100
San Juan Capistrano, CA 92675

LLG Ref. 2-16-3774-1

Prepared by:
Garrett Milovich
Transportation Engineer II

Under the Supervision of:
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Principal

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TABLE 6-2

CUMULATIVE PROJECTS TRIP GENERATION FORECAST[8]

Cumulative Project Description	Daily 2-Way	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
1. Artisan Alley Mixed Use	5,543	135	105	240	283	174	457
2. Walmart Superstore[9]	8,424	166	125	291	280	295	575
3. Pasadena Industrial Park	995	115	16	131	17	122	139
4. Golden Corral Restaurant	736	41	34	75	26	17	43
5. Ness Industrial	91	11	1	12	2	11	13
6. Fairway Business Park	132	15	2	17	2	16	18
7. Air Stream RV Dealership	155	0	0	0	6	10	16
8. La Quinta Inn Hotel	515	19	14	33	19	19	38
9. Central Plaza Shopping Center	2,767	39	23	62	84	92	176
10. Canyon Hills Phase 8	2,649	34	167	201	159	78	237
11. Summerly (McMillan Homes)	4,760	94	281	375	315	185	500
12. Rosetta Canyon Trieste Homes	704	14	42	56	47	27	74
13. Meadowridge II (Pardee)	781	16	46	62	52	30	82
14. Diamond Stadium Indoor Sports Park	1,537	16	0	16	152	59	211
15. Orange Bundy/Parcel Map[10]	1,689	62	60	122	64	60	124
16. Bundy Canyon Plaza	1,421	20	12	32	44	46	90
17. Wal-Mart Retail	8,795	178	138	316	298	312	610
18. Darling/Bundy Canyon Res.	931	14	57	71	57	30	87
Cumulative Projects Trip Generation Potential	**42,625**	**989**	**1,123**	**2,112**	**1,907**	**1,583**	**3,490**

8 Unless otherwise noted; Source: *Trip Generation, 9th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2012).* Where applicable, pass-by adjustment factors were utilized and are reflected in the cumulative projects trip generation potential.

9 Source: *Traffic Impact Analysis Lake Elsinore Walmart*, prepared by Urban Crossroads, dated November 13, 2013.

10 Source: *Traffic Impact Analysis Menifee Town Center*, prepared by Kunzman Associates, Inc., dated May 29, 2012.

Lakeview Manor (PAR 2016-09)
Lakeshore Drive at Gunnerson Street
Lake Elsinore, California 92530

Traffic Impact Analysis
January 9, 2017

Prepared for:

Hong Guan, LLC
14785 Jeffrey Rd #201
Irvine, CA 92618

Prepared by:

LOS Engineering, Inc.
11622 El Camino Real, Suite 100, San Diego, CA 92130
Phone 619-890-1253, Fax 619-374-7247

Job #1627

3.0 Projected Future Traffic

A. PROJECT TRAFFIC

1. AMBIENT GROWTH RATE

An ambient growth rate of 2% per year was applied over two years for a total of 4% to represent an opening year of 2018.

2. TRIP GENERATION

The project trip generation was calculated using the 9th Edition of Institute of Transportation Engineers (ITE) Trip Generation, 2012 (ITE rate sheets are included in **Appendix F**) as shown in **Table 2**.

TABLE 2: PROJECT TRIP GENERATION

ITE Land Use (221)	Trip Rate	Size & Units	ADT	AM Peak Hour				PM Peak Hour			
				Rate	Split	IN	OUT	Rate	Split	IN	OUT
Low-Rise Apts (1-2 floors)	6.59 /Unit	104 Units	**685**	0.46 /Unit	0.21 0.79	**10**	**38**	0.58 /Unit	0.65 0.35	**39**	**21**

Source: *ITE 9th Edition Trip Generation*, 2012. ADT=Average Daily Traffic; Split-percent inbound and outbound.

3. TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution was based on input from City staff with a majority of 75% traveling to/from the east along Lakeshore Dr (toward town) and 25% traveling to/from the west along Lakeshore Dr. The distribution for the project is shown in **Exhibit 6**.

4. OTHER FACTORS AFFECTING TRIP GENERATION

No other trip generation factors are anticipated for the project.

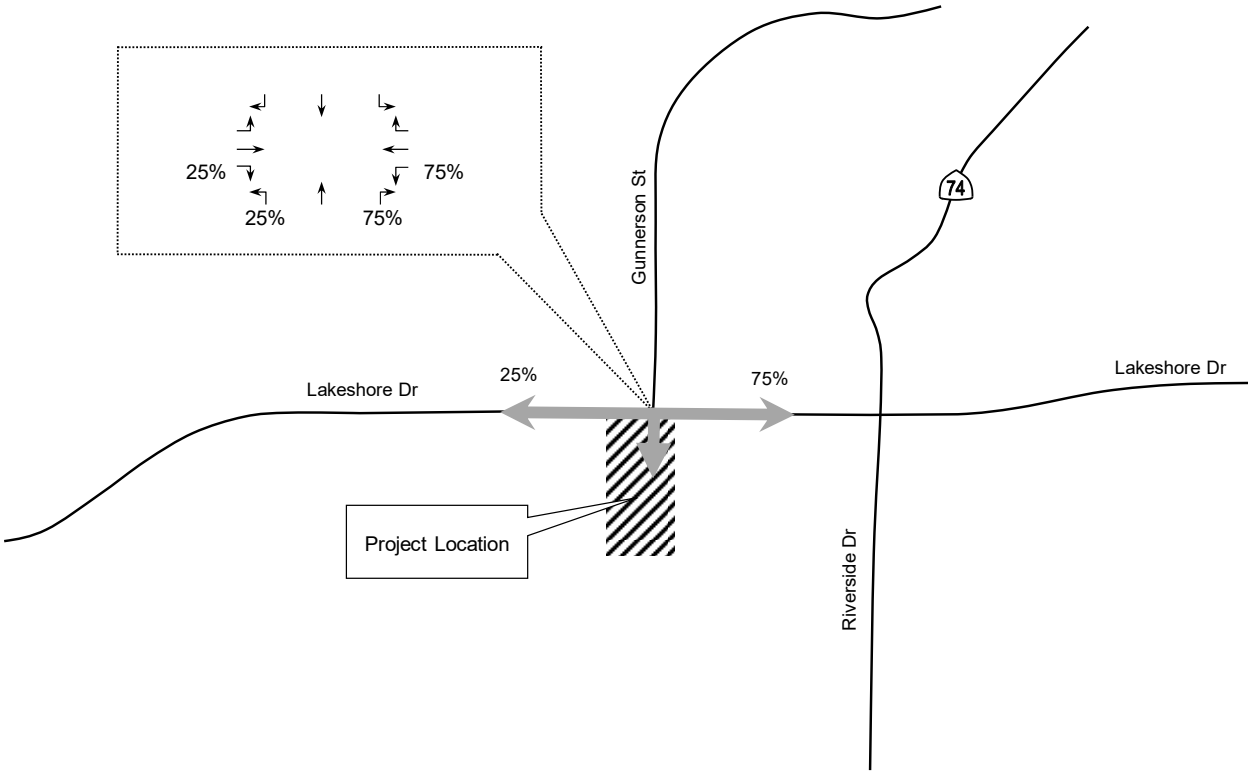
5. PROJECT PEAK HOUR TURNING MOVEMENT TRAFFIC

The project peak hour turning trip assignment is shown in **Exhibit 7**.

6. OTHER FACTORS AFFECTING TRIP GENERATION

No project phasing is planned.

Exhibit 6: Project Trip Distribution



LEGEND

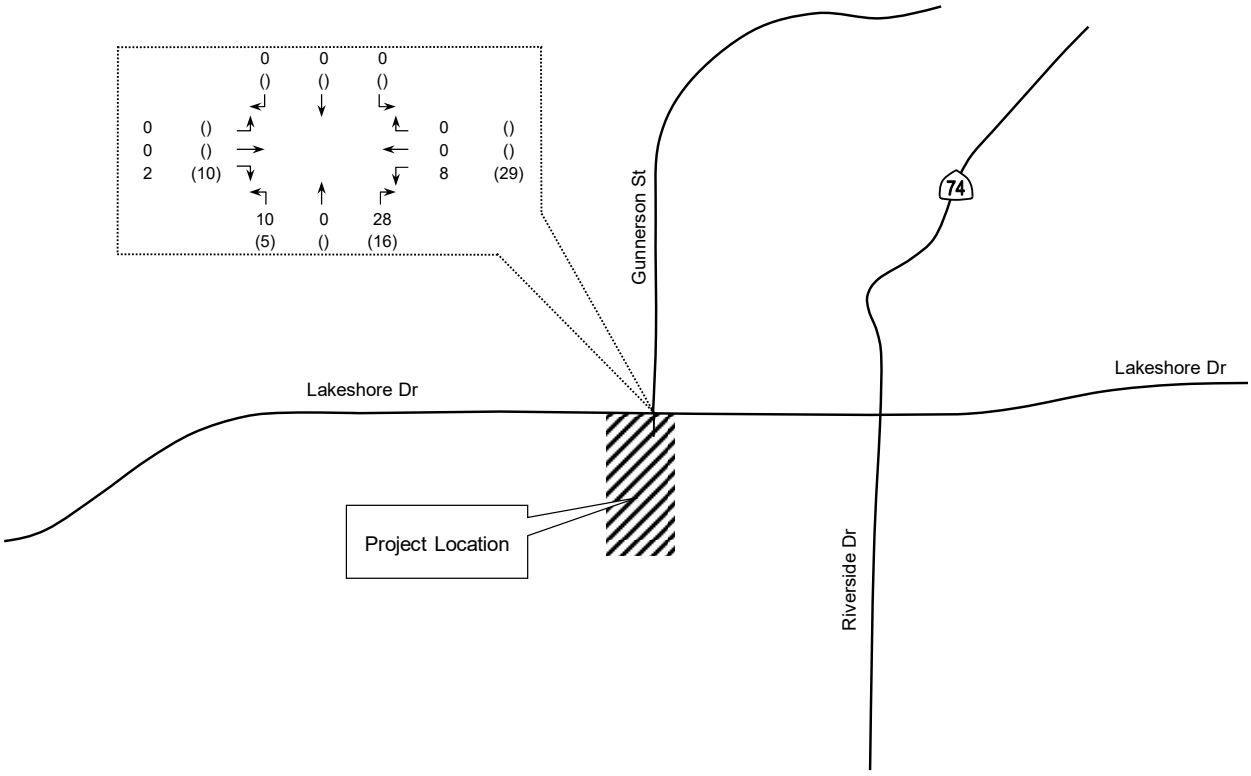
Distribution

Existing Roadways

N

No Scale

Exhibit 7: Project Trip Assignment



LEGEND

XX AM peak hour volumes at intersections

(YY) PM peak hour volumes at intersections
an empty braket ( ) represents a 0 volume

Existing Roadways

N

No Scale

Appendix E:Traffic Signal Warrants

1 - I-15 NB Ramps/Nichols Rd - Existing + Project AM P

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho

*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

10 - Gunnerson/Riverside - Existing + Project AM Peak

1427, 55

SIGNAL WARRANT NOT MET

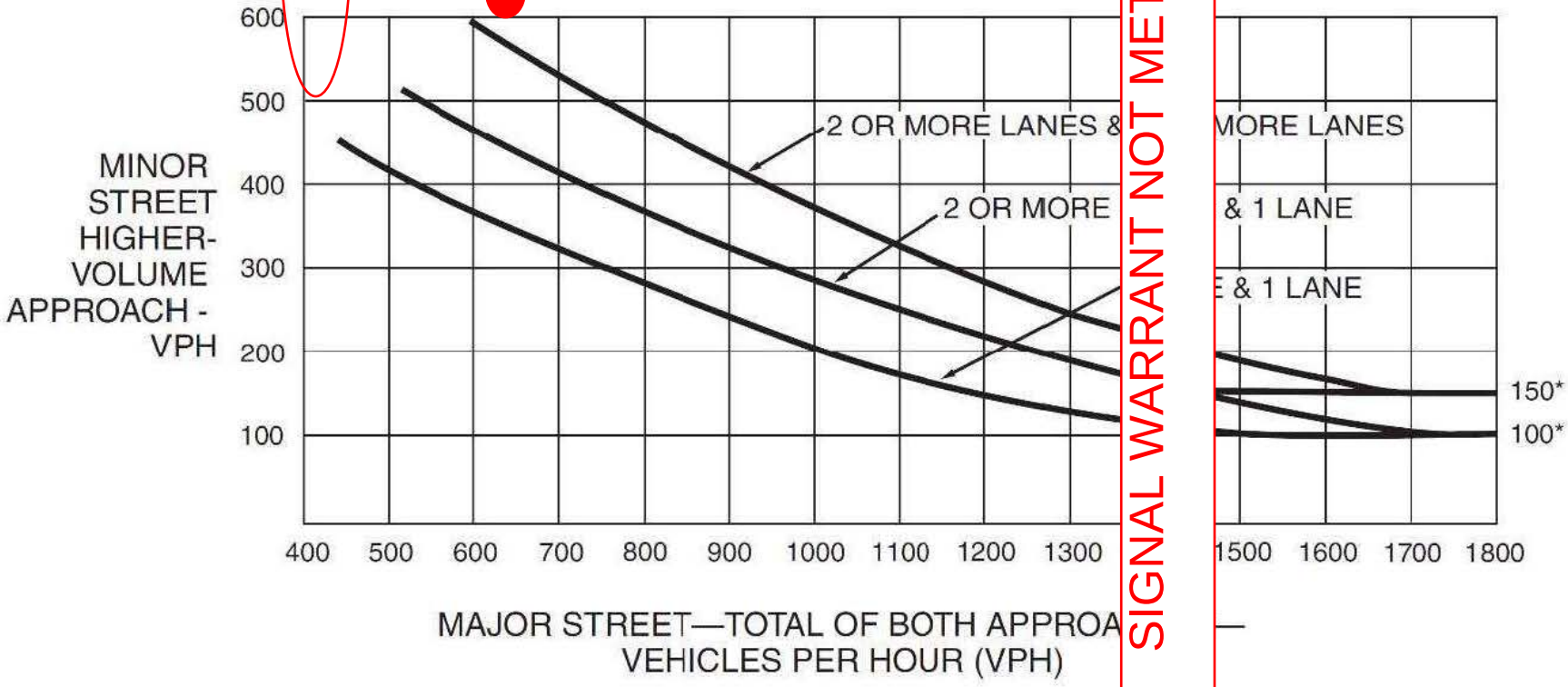


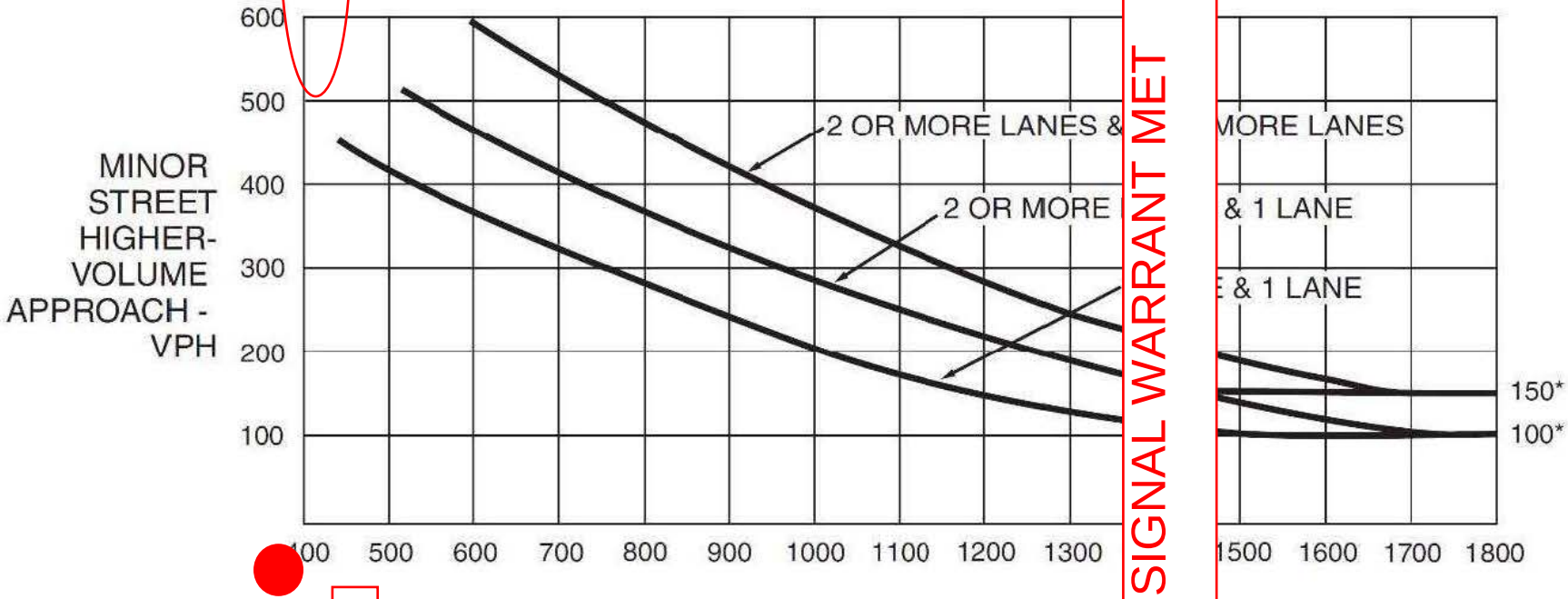
Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

3 - Collier/Nichols - Existing + Project PM Peak Hou

SIGNAL WARRANT MET

Figure 4C-3. Warrant 3, Peak Hou



773, 329

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

10 - Gunnerson/Riverside - Existing + Project PM Peak

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies a lower threshold volume for a minor-street approach with o e.

1 - I-15 NB Ramps/Nichols Rd - Existing + Ambient + Project

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho

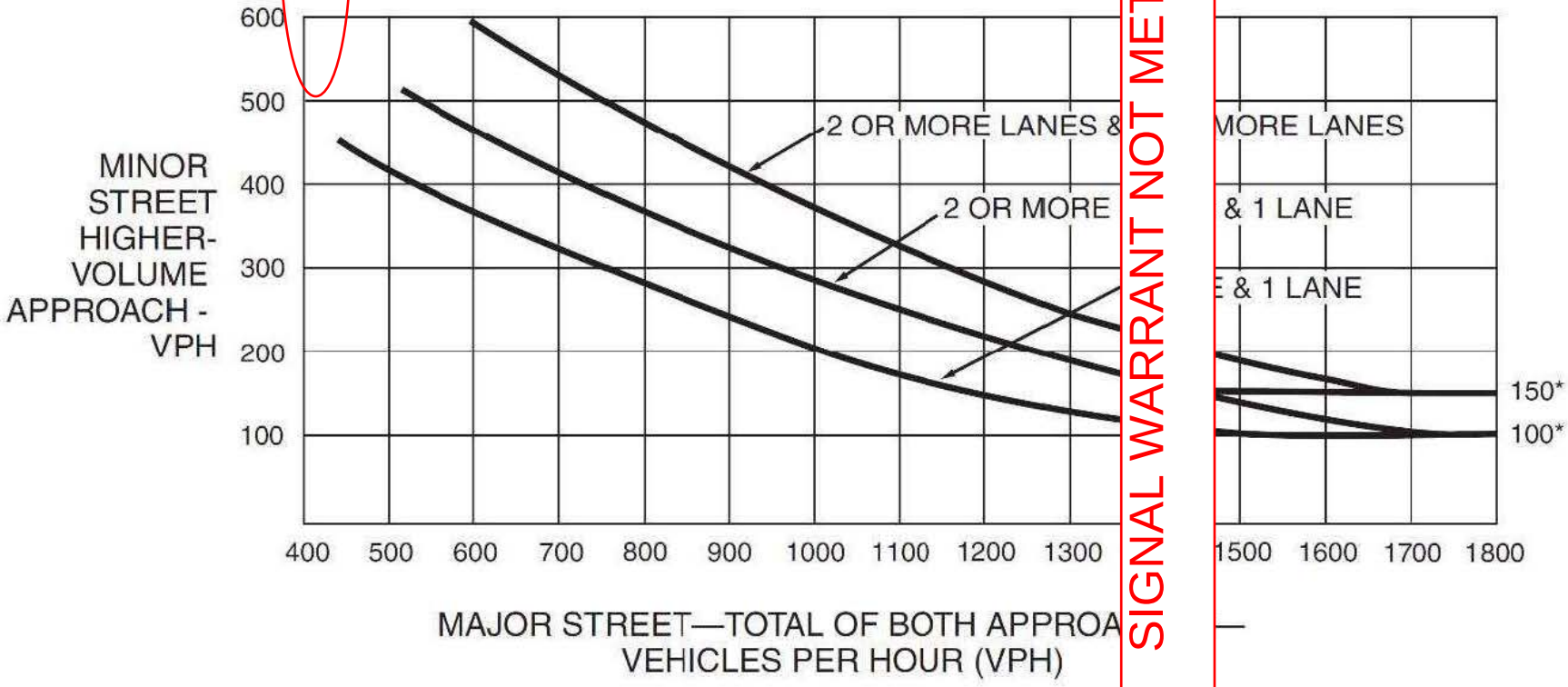
*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

10 - Gunnerson/Riverside - Existing + Ambient + Project AM

1486, 62

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

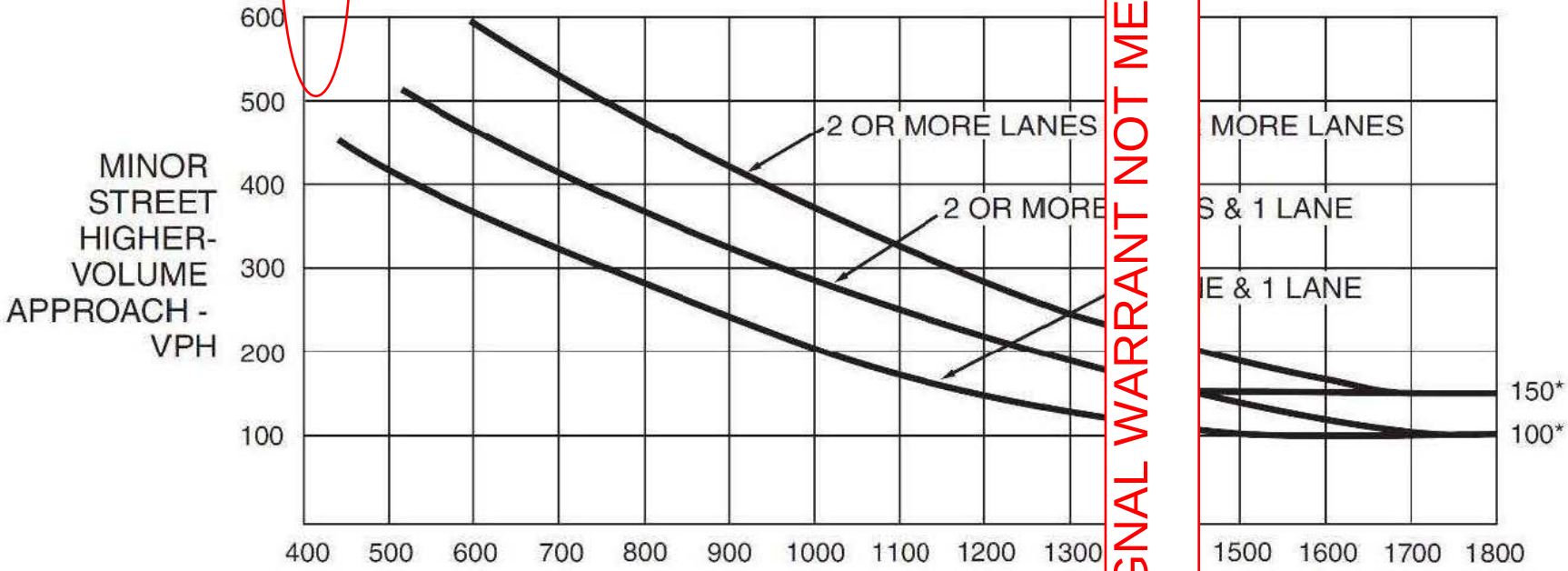


*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

1 - I-15 NB Ramps/Nichols Rd - Existing + Ambient + Project

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho



*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

470, 323

3 - Collier/Nichols - Existing + Ambient + Project PM Peak

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

SIGNAL WARRANT MET

10 - Gunnerson/Riverside - Existing + Ambient + Project PM

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with e.

1 - I-15 NB Ramps/Nichols Rd - Ex + Ambient + Cumulative + Proje

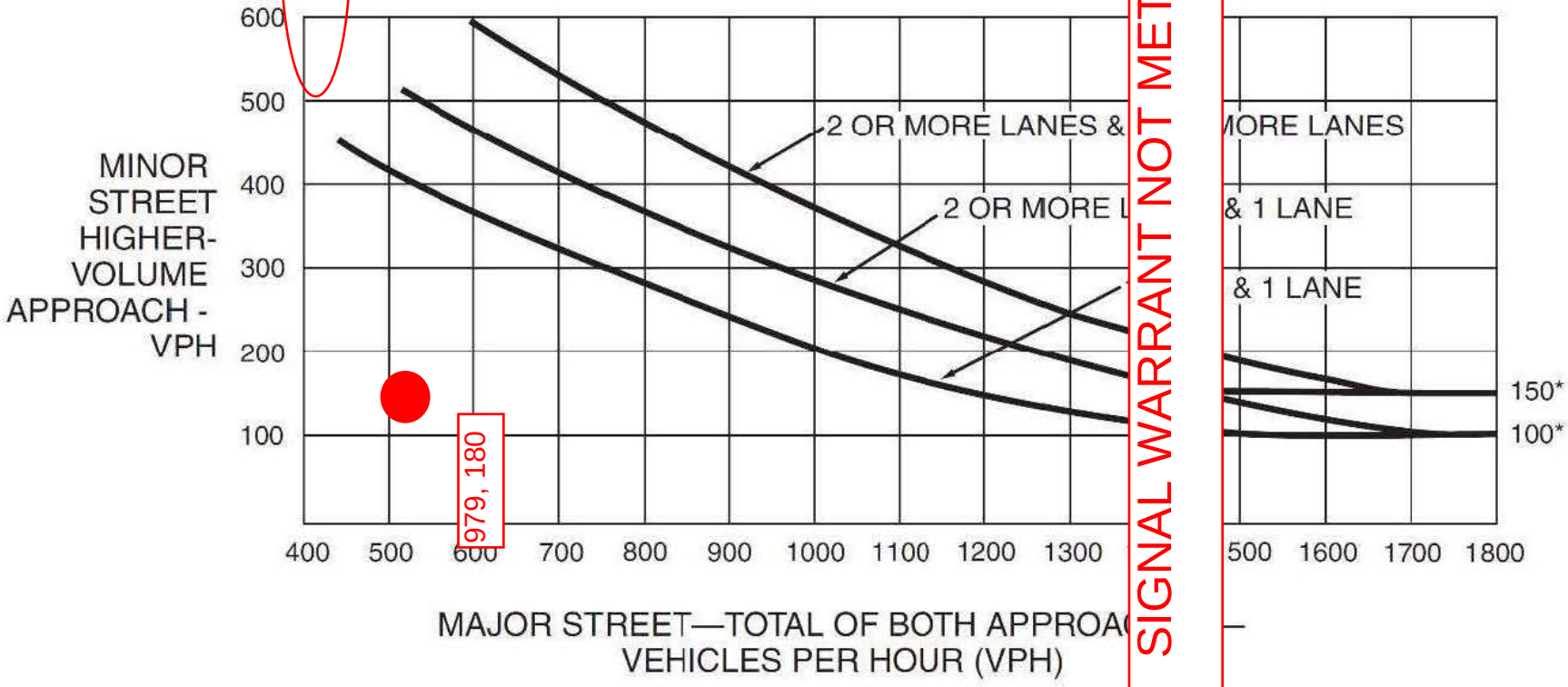
SIGNAL WARRANT MET

Figure 4C-3. Warrant 3, Peak Ho

*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

3 - Collier/Nichols - Ex + Ambient + Cumulative + Project AM

Figure 4C-3. Warrant 3, Peak Hou



*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

SIGNAL WARRANT NOT MET

10 - Gunnerson/Riverside - Ex + Ambient Cumulative + Project

SIGNAL WARRANT NOT MET

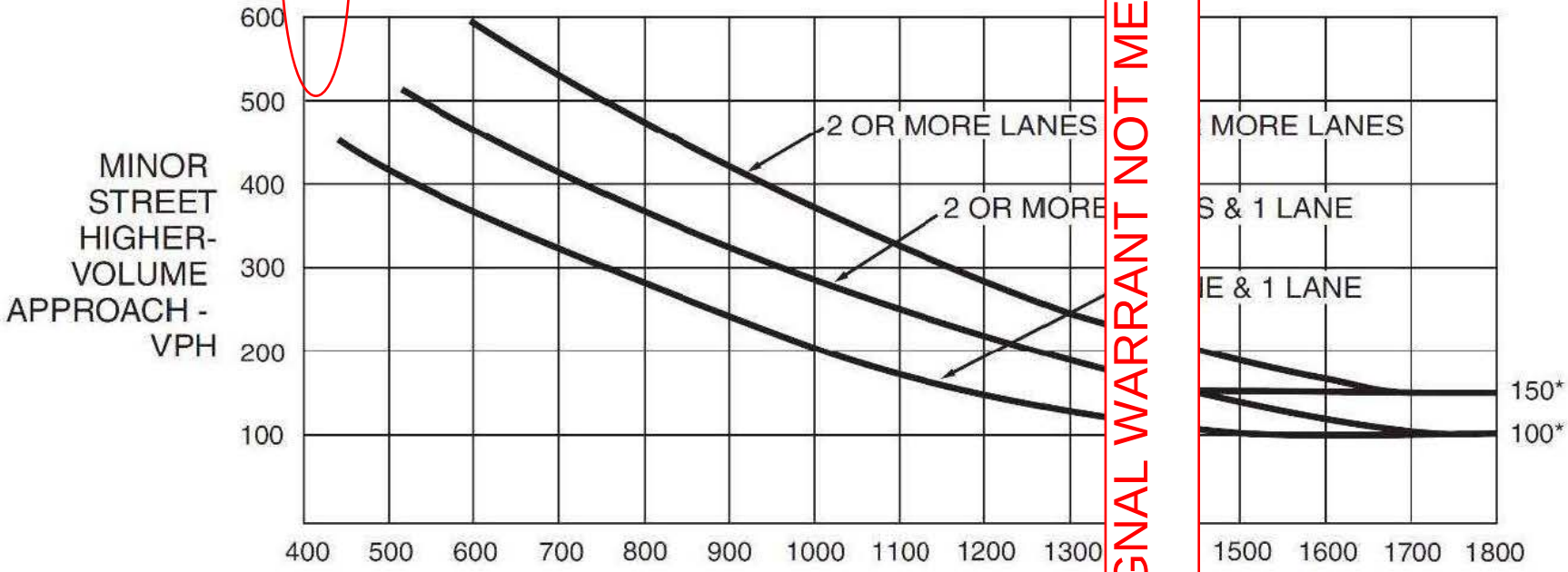
Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

1 - I-15 NB Ramps/Nichols Rd - Ex + Ambient + Cumulative + Proje

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho



534, 366

*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

3 - Collier/Nichols - Ex + Ambient + Cumulative + Project PM

SIGNAL WARRANT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

10 - Gunnerson/Riverside - Ex + Ambient Cumulative + Project

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

Appendix L

Service Planning Letter #3069-0

Elsinore Valley Municipal Water District

Service Planning Letter # 3069-0

March 23, 2018

P.O. Box 3000 ~ 31315 Chaney St ~ Lake Elsinore, CA 92530
Phone: (951) 674-3146 ~ Fax: (951) 641-7554

Description:	Commercial Travel Center (WO# 17-007)	**Zoning:**	Commercial
Address:	0 Riverside Drive	**# of Lots:**	2
City:	Lake Elsinore **State:** CA **Zip:** 92530	**Acreage:**	+-2.39
APN:	378-007-	**Tract Map:**	
Phone:	(714) 695-9300	**Pressure Zone:**	1434
Email:	jkaraki@westernsec.com		

Kassab Travel Center
4887 E. La Palma Avenue, Suite 707
Anaheim, CA 92807
Attn: Joseph Karaki

Will Serve Fees Paid: $340.00
Paid Date: 03/22/2018
Check / Receipt #: 402791

DEVELOPER
Kassab Travel Center
4887 E. La Palma Avenue, Suite 707
Anaheim, CA 92807
Attn: Joseph Karaki

ENGINEERING
Western States Engineering, Inc.
4887 E. La Palma Avenue, Suite 707
Anaheim, CA 92807
Attn: Joseph Karaki

Elsinore Valley Municipal Water District ("EVMWD") has determined that water is available to serve the above referenced project based on the information provided. Sewer will require a line extension on Collier Ave. This determination of water & sewer availability shall remain valid for two years from the date of this letter. If the construction of the project has not commenced within this two year time frame, EVMWD will be under no further obligation to serve the project unless the developer receives an updated letter from EVMWD reconfirming water and sewer availability. EVMWD reserves the right to re-evaluate, revise, and update the Service Planning Letter at any time. EVMWD considers the conditions to have expired, automatically, two years from the date of issuance of the Letter, (Section 3903. C EVMWD Administrative Code).

EVMWD will provide such potable water at such pressure as may be available from time to time as a result of its normal operations. Installation of facilities through developer funding shall be made in accordance with the current EVMWD Standards and Administration Code. In order for us to provide adequate water for domestic use as well as fire service protection, it may be necessary for the developer to fund the cost of special facilities, such as, but not limited to booster pumps, in addition to the cost of mainlines and services. EVMWD will provide more specific information regarding special facilities and fees after submittal of your improvement plans, fire department requirements, and engineering fees for this project.

An estimate of fees will be quoted during the plan check process. Once plans have been accepted by the District and mylars have been submitted a formal invoice of fees will be prepared.

For all Commercial Development, please contact Keith Martinez at (951) 674-3146, extension 8326 regarding District requirements, Industrial Waste application, fees and inspection.

This letter shall at all times be subject to such changes or modifications by EVMWD.
If you have any questions regarding the above, please contact me at (951) 674-3146 Ext. 8427

Authorized by: Christina Bachinski **Date:** 3/23/18

Elsinore Valley Municipal Water District

RECEIVED
MAR 22 2018
EVMWD
ENGINEERING DEPARTMENT
BY: HG

COMMERCIAL/INDUSTRIAL
ELSINORE VALLEY MUNICIPAL WATER DISTRICT
WILL SERVE & CONNECTION FEE APPLICATION

GENERAL INFORMATION

Date of Application: Mar 22, 2018

Agency Requesting Letter: PLANNING DEPT./BUILDING & SAFETY

Preferred Delivery Method of Completed Will Serve (Check One):
- ☐ Pickup at District Offices
- ☑ Email to (Circle one): Owner/Developer Representative
- ☐ Mail to (Circle one): Owner/Developer Representative

CONTACT INFORMATION

Owner/Developer

Contact Name: RON KASSAB/JOSEPH KARAKI

Business Name: KASSAB TRAVEL CENTER

Mailing Address: C/O 4887 E. LA PALMA AVE., SUITE 707 City: ANAHEIM State: CA Zip: 92807

Email: jkaraki@westernsec.com Telephone: (714) 695-9300 Ext. 100

Representative for Owner/Developer (or) Engineering Firm, if applicable

Contact Name: JOSEPH KARAKI

Business Name: WESTERN STATES ENGINEERING INC. Business Type: DESIGN & BUILD

Mailing Address: 4887 E. LA PALMA AVE., SUITE 707 City: ANAHEIM State: CA Zip: 92807

Email: jkaraki@westernsec.com;rayojeda@westernsec.com Telephone: (714) 695-9300 Ext. 100

PROJECT INFORMATION

Property Address: 29301 RIVERSIDE DRIVE City: LAKE ELSINORE State: CA Zip: 92530

Assessor's Parcel Number(s): 378-030-07 & 378-030-09

Total Acres: +- 2.39 ACRES

Nearest Cross Streets: COLLIER AVE.

Type of Construction: ☑ New Construction** ☐ Tenant Improvement ☐ New Tenant ☐ Change in Ownership

Will Serve Request for: ☑ Water & Sewer ☐ Water Only ☐ Sewer Only ☑ Irrigation Meters

** FOR NEW COMMERCIAL/INDUSTRIAL BUILDINGS:

- ☑ Attach a Site Map (8.5" x 11") identifying building/suite numbers, associated square footage(s), and intended uses (i.e. office, warehouse, retail, restaurant, etc.).
- ☐ Provide Engineer's domestic & irrigation water demand calculations.

Elsinore Valley Municipal Water District

SERVICES REQUESTED

	SEWER	WATER		
Building/Suite #	**No. of Units**	**Meter Type** Domestic / Irrigation	**Meter Size** ¾" 1" 1-½" 2" 3" 4"	**Backflow Required?** Yes / No / Not applicable
BUILDING "A"	2	Domestic and Irrigation	2	Yes NOT SURE YET
Building "B"	1	Domestic	2	Yes
Canopy 1	N/A	N/A	N/A	N/A
canopy 2	N/A	N/A	N/A	N/A

If you require more information please contact Engineering at (951) 674-3146 Ext. 8427

ENGINEERING FEES (*EVMWD Administrative Code, Section 2600*)

SERVICE AVAILABILITY LETTERS

Tract & Commercial Development $340.00

INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED.

FOR EVMWD USE ONLY

Fees Due: _____ Reviewed by: _____

Reimbursements: ☐ Yes ☐ No Reimbursement #(s) _____

Date Payment Received: _____ Receipt No.: _____ CK: _____

Date Received by Engineering: _____ Division: _____

Will Serve #: _____ WO#: _____ ☐GIS ☐Log ☐CIPAce

Previous Account#: _____ Meter Size: _____ Pressure Zone: _____

Mail application form with appropriate fee to: EVMWD, P.O. Box 3000, Lake Elsinore, CA 92531-3000.

For questions, please contact Engineering at (951) 674-3146 Ext. 8427 or email Development@evmwd.net.

Please allow up to 10 working days for processing once the completed application has been accepted by the District.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # BUILDING "A" **Square Footage** +- 8,360 S.F.

OPERATION(S) (*Check all that apply.*)

- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☐ Restaurant, # Fixtures_____
- ☑ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☐ Service Station
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet
- ☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

Building "A" is a proposed convenience store that caters for both transients and the neigborhood.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # Building "B" (QSR with drive thru window) **Square Footage** 2,543 S.F.

OPERATION(S) (*Check all that apply.*)

- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☑ Restaurant, # Fixtures 10
- ☐ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☐ Service Station
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet
- ☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

Building "B" is a Quick Service Restaurant (QSR) with a drive through pick-up window.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # Canopy 1 **Square Footage** 4,392 S.F.

OPERATION(S) (*Check all that apply.*)

- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms_____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☐ Restaurant, # Fixtures_____
- ☐ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☑ Service Station
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet

☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # Canopy 2 **Square Footage** 1,700 S.F.

OPERATION(S) (*Check all that apply.*)

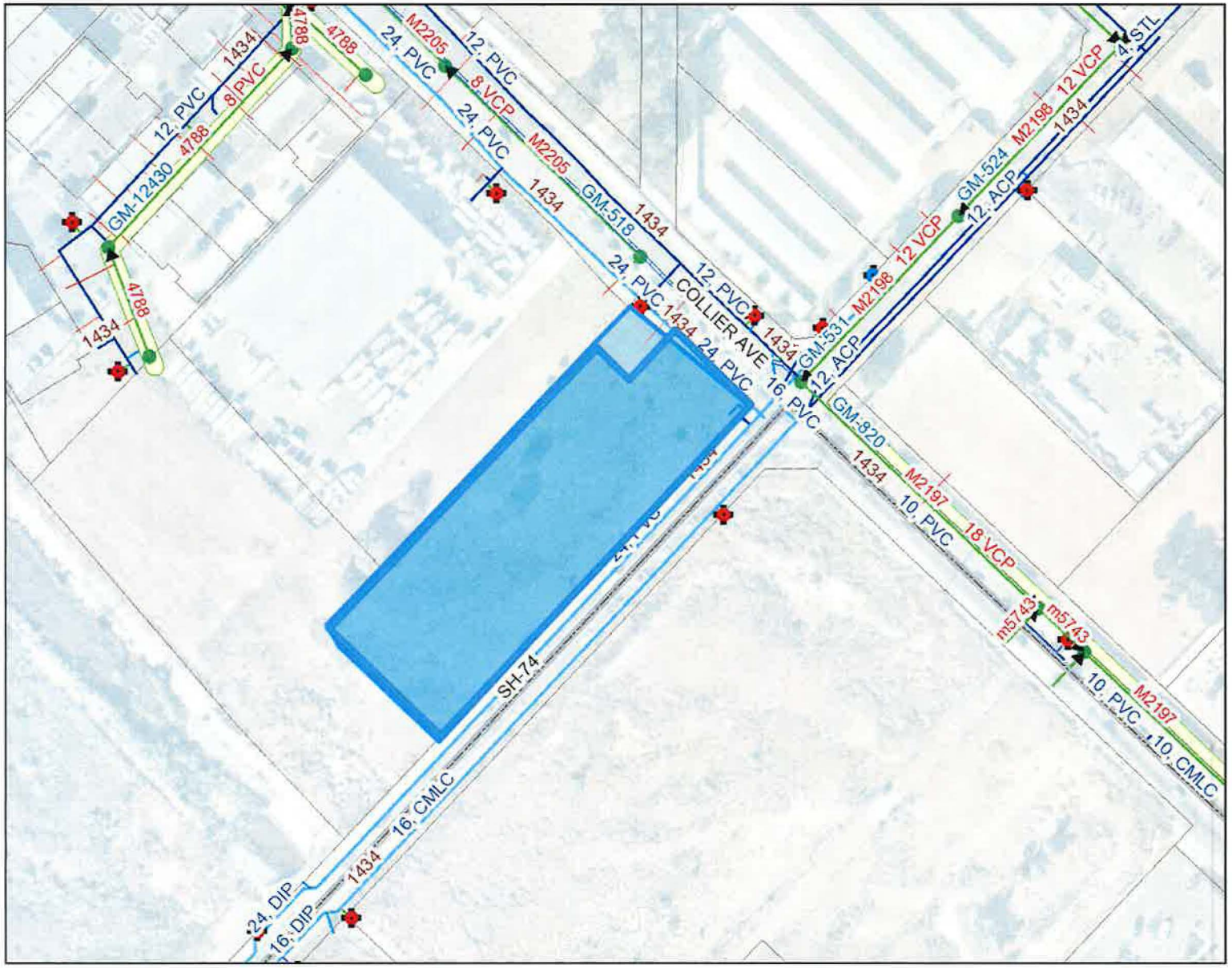
- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☐ Restaurant, # Fixtures_____
- ☐ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☑ Service Station (GAS/FUELLING)
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet
- ☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

CANOPY 2 is a Gas Fuelling Station for RV.

378-030-007 & 378-030-009

Elsinore Valley Municipal Water District



Legend

- EVMWD Boundary
- Highways
- Street Centerlines
- Parcels
- Waterbodies
- Force Main
- Gravity Mains
- Label Gravity Mains
- Label Gravity Mains Diameter
- Label Gravity Mains ID
- Manhole
- Service Laterals
- Sewer Easements
- Fire Hydrants
  - Fire Hydrant
  - Wharfhead
- Label Pressure Main
- Label Pressure Zone
- Pressure Main
  - Distribution Main
  - Transmission Main
  - Air Release
  - Blowoff
  - Hydrant Lateral
  - Unknown
  - Sampling Point
- Pump Station

1: 1,968

328.0 0 163.98 328.0 Feet

Data Sources: EVMWD, County of Riverside

This application has been provided to give a visual display of District facilities and related geographic information. To be sure of complete accuracy, please check with Engineering staff for the most up to date information.

3/23/2018 10:34:36 AM

Notes

Elsinore Valley Municipal Water District

31315 Chaney St
PO Box 3000
Lake Elsinore, CA 92531
Office: (951) 674-3146
Fax: (951) 346-3352

March 22, 2018 10:41

Staff ID:	SMUN
Receipt No.	402791
Account:	
Customer:	
Service:	

Tender Methods

Visa	($340.00)
Total	($340.00)
Change	$0.00

Beginning Balance	$340.00
Payments applied	($340.00)

THANK YOU FOR YOUR PAYMENT !

Did you know you can make payments 24/7 using your credit/debit card by calling our main number or accessing your account at www.evmwd.com?

Visit our website at www.evmwd.com to access your account and make payments 24/7 or get valuable conservation information.

USE WATER WISELY!

Appendix A

Air Quality and Greenhouse Gas Emissions Impact Analysis

AIR QUALITY AND GREENHOUSE GAS EMISSIONS IMPACT ANALYSIS

KASSAB TRAVEL CENTER PROJECT

CITY OF LAKE ELSINORE

LEAD AGENCY:
CITY OF LAKE ELSINORE
PLANNING DIVISION
COMMUNITY DEVELOPMENT DEPARTMENT
130 SOUTH MAIN STREET
LAKE ELSINORE, CA 92530

PREPARED BY:
VISTA ENVIRONMENTAL
1021 DIDRIKSON WAY
LAGUNA BEACH, CALIFORNIA 92651
MARISA JUE
GREG TONKOVICH, AICP
TELEPHONE (949) 510-5355
FACSIMILE (949) 494-3150

PROJECT NO. 17028

JULY 1, 2017

[REVISED SEPTEMBER 26, 2018]

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ACRONYMS AND ABBREVIATIONS

Air Basin	South Coast Air Basin
AQMP	Air Quality Management Plan
CAAQS	California Ambient Air Quality Standards
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DPM	Diesel particulate matter
EPA	Environmental Protection Agency
ºF	Fahrenheit
GHG	Greenhouse gas
GWP	Global warming potential
HFCs	Hydrofluorocarbons
IPCC	International Panel on Climate Change
LST	Localized Significant Thresholds
MSAT	Mobile Source Air Toxics
$MTCO_2e$	Metric tons of carbon dioxide equivalent
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NO_x	Nitrogen oxides
NO_2	Nitrogen dioxide
O_3	Ozone
PM	Particle matter
PM10	Particles that are less than 10 micrometers in diameter
PM2.5	Particles that are less than 2.5 micrometers in diameter
PPM	Parts per million
PPB	Parts per billion

PPT	Parts per trillion
RTIP	Regional Transportation Improvement Plan
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO_x	Sulfur oxides
TAC	Toxic air contaminants
UNFCCC	United Nations' Framework Convention on Climate Change
VOC	Volatile organic compounds

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Air Quality and Greenhouse Gas Emissions Impact Analysis has been completed to determine the air quality and greenhouse gas (GHG) emissions impacts associated with the proposed Kassab Travel Center project (proposed project). The following is provided in this report:

- A description of the proposed project;
- A description of the atmospheric setting;
- A description of the criteria pollutants and GHGs;
- A description of the air quality regulatory framework;
- A description of the air quality and GHG emissions thresholds including the California Environmental Quality Act (CEQA) significance thresholds;
- An analysis of the short-term construction related and long-term operational air quality and GHG emissions impacts;
- An analysis of the conformity of the proposed project with the South Coast Air Quality Management District (SCAQMD) Air Quality Management Plan (AQMP); and
- An analysis of the conformity of the proposed project with all applicable GHG emissions reduction plans and policies.

1.2 Site Location and Study Area

The project site is located in the northern portion of the City of Lake Elsinore (City) on the west corner of Riverside Drive and Collier Avenue at 29301 Riverside Drive. The approximately 2.84-acre project site is located on a vacant parcel that is bounded by commercial uses to the northwest, Collier Avenue and commercial uses to the northeast, Riverside Drive and vacant land to the southeast, and vacant land to the southwest. The project local study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest offsite sensitive receptors to the project site consist of workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet west of the project site. The nearest school to the project site is Temescal Canyon High School that is located as near as 0.5 mile north of the project site.

1.3 Proposed Project Description

The proposed project would consist of the development of an 18-vehicle fueling position gasoline and diesel station with two canopies that total 6,092 square feet, an 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include multiple parking areas with a total of 78-spaces. The proposed site plan is shown in Figure 2.

1.4 Standard Air Quality and GHG Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the SCAQMD and State of California (State).

South Coast Air Quality Management District Rules

The following lists the SCAQMD rules that are applicable to all non-residential projects in the South Coast Air Basin (Air Basin).

Rule 402 - Nuisance

Rule 402 prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Compliance with Rule 402 will reduce local air quality and odor impacts to nearby sensitive receptors.

Rule 403- Fugitive Dust

Rule 403 governs emissions of fugitive dust during construction activities and requires that no person shall cause or allow the emissions of fugitive dust such that dust remains visible in the atmosphere beyond the property line or the dust emission exceeds 20 percent opacity, if the dust is from the operation of a motorized vehicle. Compliance with this rule is achieved through application of standard Best Available Control Measures, which include but are not limited to the measures below. Compliance with these rules would reduce local air quality impacts to nearby sensitive receptors.

- Utilize either a pad of washed gravel 50 feet long, 100 feet of paved surface, a wheel shaker, or a wheel washing device to remove material from vehicle tires and undercarriages before leaving project site.
- Do not allow any track out of material to extend more than 25 feet onto a public roadway and remove all track out at the end of each workday.
- Water all exposed areas on active sites at least three times per day and pre-water all areas prior to clearing and soil moving activities.
- Apply nontoxic chemical stabilizers according to manufacturer specifications to all construction areas that will remain inactive for 10 days or longer.
- Pre-water all material to be exported prior to loading, and either cover all loads or maintain at least 2 feet of freeboard in accordance with the requirements of California Vehicle Code Section 23114.
- Replant all disturbed area as soon as practical.
- Suspend all grading activities when wind speeds (including wind gusts) exceed 25 miles per hour.
- Restrict traffic speeds on all unpaved roads to 15 miles per hour or less.

Rules 461 – Gasoline Dispensing Facilities

Rule 461 governs the operation of gasoline stations and requires that all underground storage tanks are equipped with a "CARB certified" enhanced vapor recovery system, all fill tubes are equipped with vapor tight caps, all dry breaks are equipped with vapor tight seals, a spill box shall be installed to capture any gasoline spillage, and all equipment is required to be properly maintained per CARB regulations. All gasoline dispensing units are required to be equipped with a "CARB certified" vapor recovery system, the dispensing system components all maintain vapor and liquid tight connections at all times and the breakaway coupling shall be equipped with a poppet valve that shall close when coupling is separated. Rule 461 also provides several additional requirements including detailed maintenance, testing, reporting, and recordkeeping requirements for all gas stations.

Rules 1108 and 1108.1 – Cutback and Emulsified Asphalt

Rules 1108 and 1108.1 govern the sale, use, and manufacturing of asphalt and limits the VOC content in asphalt. This rule regulates the VOC contents of asphalt used during construction as well as any on-going maintenance during operations. Therefore, all asphalt used during construction and operation of the proposed project must comply with SCAQMD Rules 1108 and 1108.1.

Rule 1113 – Architectural Coatings

Rule 1113 governs the sale, use, and manufacturing of architectural coatings and limits the VOC content in sealers, coatings, paints and solvents. This rule regulates the VOC contents of paints available during construction. Therefore, all paints and solvents used during construction and operation of the proposed project must comply with SCAQMD Rule 1113.

Rule 1143 – Paint Thinners

Rule 1143 governs the sale, use, and manufacturing of paint thinners and multi-purpose solvents that are used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations. This rule regulates the VOC content of solvents used during construction. Solvents used during construction and operation of the proposed project must comply with SCAQMD Rule 1143.

State of California Rules

The following lists the State of California rules that are applicable to all nonresidential projects in the State.

CARB Regulation for In-Use Off-Road Diesel Vehicles

On July 26, 2007, the California Air Resources Board (CARB) adopted California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449 to reduce diesel particulate matter (DPM) and NOx emissions from in-use off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. Performance requirements of the rule are based on a fleet's average NOx emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirement making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less). Currently, no commercial operation in California may add any equipment to their fleet that has a Tier 0 or Tier 1 engine. By January 1, 2018 medium and large fleets will be restricted from adding Tier 2 engines to their fleets and by January 2023, no commercial operation will be allowed to add Tier 2 engines to their fleets. It should be noted that commercial fleets may continue to use their existing Tier 0 and 1 equipment, if they can demonstrate that the average emissions from their entire fleet emissions meet the NOx emissions targets.

CARB Resolution 08-43 for On-Road Diesel Truck Fleets

On December 12, 2008 the CARB adopted Resolution 08-43, which limits NOx, PM10 and PM2.5 emissions from on-road diesel truck fleets that operate in California. On October 12, 2009 Executive Order R-09-010 was adopted that codified Resolution 08-43 into Section 2025, title 13 of the California Code of Regulations. This regulation requires that by the year 2023 all commercial diesel trucks that operate in California shall meet model year 2010 (Tier 4 Final) or latter emission standards. In the interim period, this regulation provides annual interim targets for fleet owners to meet. By January 1, 2014, 50 percent of a truck fleet is required to have installed Best Available Control Technology (BACT)

for NOx emissions and 100 percent of a truck fleet installed BACT for PM10 emissions. This regulation also provides a few exemptions including a onetime per year 3-day pass for trucks registered outside of California. All on-road diesel trucks utilized during construction of the proposed project will be required to comply with Resolution 08-43.

California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24) standards require the installation of insulated hot water pipes, improved window performance, improved wall insulation, and mandatory duct sealing. Other Title 24 requirements include the use of cool roofing shingles, a minimum 1-inch air space between roof material and roof deck, and a minimum of R-22 roof/ceiling insulation. All lighting is required to be high efficiency and daylight sensors and motion sensors are required for outdoor lighting, bathrooms, utility rooms, and other spaces. The forced air systems are required to limit leakage to 5 percent or less and requires all heat pump systems to be equipped with liquid line filter driers. The 2016 Title 24 Part 6 standards are anticipated to reduce electricity consumption by 281 gigawatt-hours per year and natural gas consumption by 16 million therms per year (http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf).

California Code of Regulations (CCR) Title 24, Part 11

CCR Title 24, Part 11: *California Green Building Standards* (Title 24) requires that new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant-emitting finish materials. One focus of CCR Title 24, Part 11 is water conservation measures, which reduce GHG emissions by reducing electrical consumption associated with pumping and treating water. CCR Title 24, Part 11 has approximately 52 nonresidential mandatory measures and an additional 130 provisions for optional use. Some key mandatory measures for non-residential buildings include a 20 percent reduction of potable water use within buildings through use of low-flow fixtures, a 50 percent construction waste diversion from landfills, and use of building finish materials and carpets that emit low levels of volatile organic compounds.

1.5 Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines air quality and GHG emissions checklist questions.

Conflict with or obstruct implementation of the applicable air quality plan?

Less than significant impact.

Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less than significant impact.

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?

Less than significant impact.

Expose sensitive receptors to substantial pollutant concentrations?

Less than significant impact.

Create objectionable odors affecting a substantial number of people?

Less than significant impact.

Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than significant impact.

Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?

Less than significant impact.

1.6 Project Design Features Incorporated into the Proposed Project

This analysis was based on implementation of the following project design features that are either already depicted on the proposed project site plan and architectural plans or are required from State Regulations.

Project Design Feature 1

The project applicant shall implement Measure T-1.2 from the Climate Action Plan, which requires the installation of sidewalks along the project site boundary that is adjacent to Riverside Drive and Collier Avenue as well as internal sidewalks to connect to neighborhood activity centers, major destinations, and transit facilities.

Project Design Feature 2

The project applicant shall implement Measure T-1.4 from the Climate Action Plan, which requires the installation of a Class II bike lane along the project site boundary with Riverside Drive and Collier Avenue as specified in the Bikeway Plan depicted in the City of Lake Elsinore General.

Project Design Feature 3

The project applicant shall implement Measure T-1.5 from the Climate Action Plan, which requires the installation of bicycle parking spaces to equal five percent of the visitor parking capacity. This shall be achieved by providing a two-bike capacity rack east of the entrance to the Convenience Store and a two-bike capacity rack south of the entrance the Drive-Thru Restaurant, as detailed on the Site Plan (See Figure 2).

Project Design Feature 4

The project applicant shall implement Measure T-4.1 from the Climate Action Plan, which requires the institution of a trip reduction program for employers with fewer than 100 employees. The trip reduction program shall consist of a board in the employee work area of the Convenience Store and Drive-Thru Restaurant that provides bus route maps and information about carpooling and bicycling to work.

Project Design Feature 5

The project applicant shall prepare a Landscape Plan that meets the requirements of Measures E-1.1 and E-4.1 from the Climate Action Plan, which requires that all new developments plant a minimum one 15 gallon nondeciduous umbrella form tree per 30 linear feet of boundary length (minimum of 47 trees for the project site) and that the Landscape Plan is designed to be consistent with the requirements detailed in Assembly Bill 1881.

Project Design Feature 6
The project applicant shall implement Measure E-1.2 from the Climate Action Plan, which requires the use of roofing material that has an initial Solar Reflectance Index (SRI) of 75 (or 0.75 if on 1.0 scale) or higher as detailed in Section 140.3 of the 2013 Title 24 Part 6 (CalGreen) Building Standards.

Project Design Feature 7
The project applicant shall implement Measure S-1.1 from the Climate Action Plan, which require the project applicant to contract with a waste provider that provides recycling services that diverts a minimum of 65 percent of the solid waste generated by the proposed project.

Project Design Feature 8
The project applicant shall implement Measure S-1.4 from the Climate Action Plan, which requires that the building contractor recycles a minimum of 65 percent of the nonhazardous construction debris generated from construction of the proposed project. This shall be achieved by the preparation of a waste management plan for the project and a copy of the completed waste management report will be submitted to the City at the completion of construction.

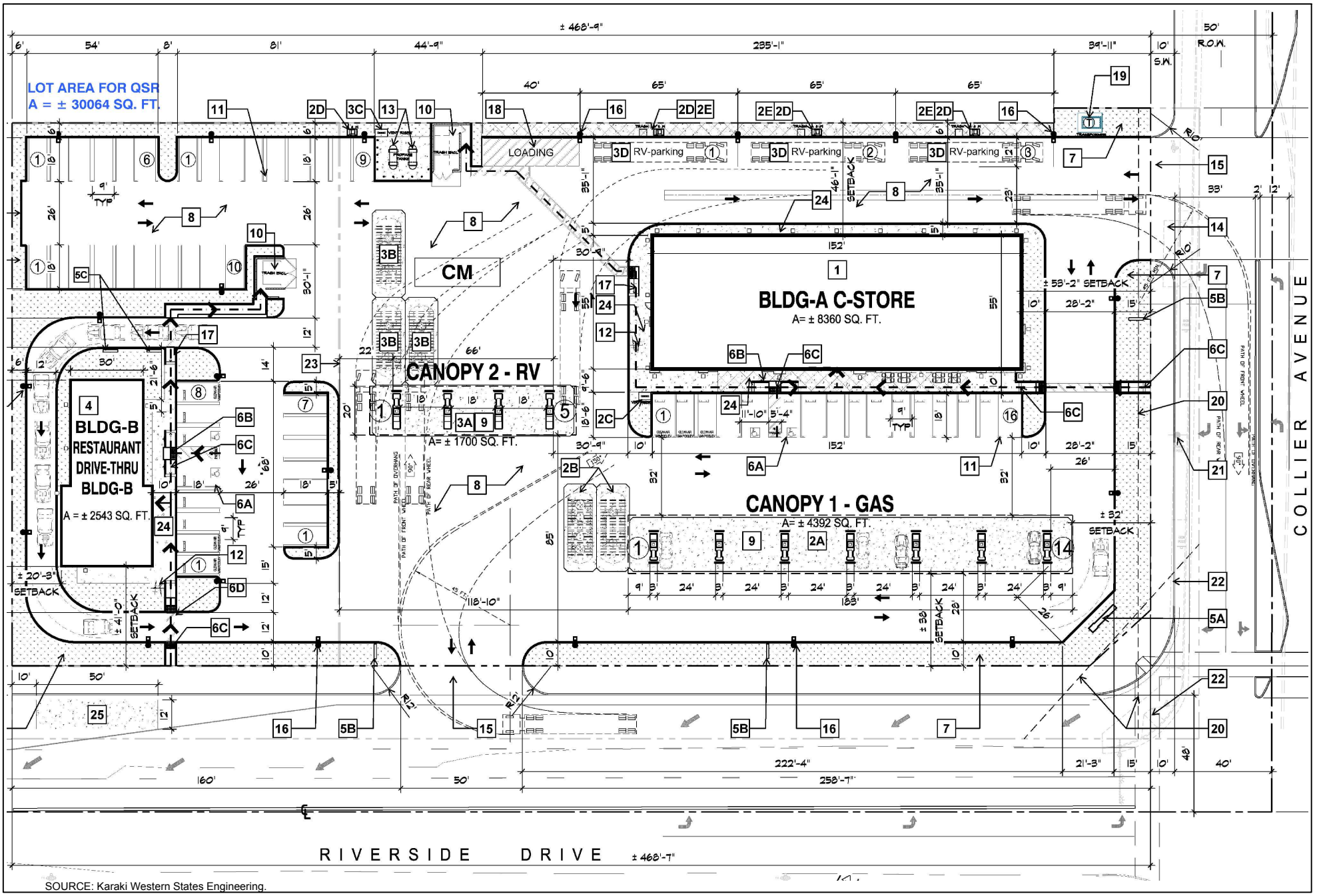
1.7 Mitigation Measures Required for the Proposed Project

This analysis found that implementation of the State and SCAQMD air quality and GHG emissions reductions regulations plus Project Design Features 1 through 8 were adequate to limit criteria pollutants, toxic air contaminants, odors, and GHG emissions from the proposed project to less than significant levels. No mitigation measures are required for the proposed project with respect to air quality and GHG emissions.

SOURCE: Google Earth

VISTA ENVIRONMENTAL

Figure 1
Project Local Study Area



SOURCE: Karaki Western States Engineering.

VISTA ENVIRONMENTAL

Figure 2
Proposed Site Plan

2.0 POLLUTANTS

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). A summary of federal and state ambient air quality standards is provided in the Regulatory Framework section.

2.1 Criteria Pollutants

The criteria pollutants consist of: ozone, nitrogen oxides, carbon monoxide, sulfur oxides, lead, and particulate matter. These pollutants can harm your health and the environment, and cause property damage. The Environmental Protection Agency (EPA) calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria for setting permissible levels. The following provides descriptions of each of the criteria pollutants.

Nitrogen Oxides

Nitrogen Oxides (NOx) is the generic term for a group of highly reactive gases which contain nitrogen and oxygen. While most NOx are colorless and odorless, concentrations of nitrogen dioxide (NO_2) can often be seen as a reddish-brown layer over many urban areas. NOx form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuel. NOx reacts with other pollutants to form, ground-level ozone, nitrate particles, acid aerosols, as well as NO_2, which cause respiratory problems. NO_x and the pollutants formed from NO_x can be transported over long distances, following the patterns of prevailing winds. Therefore controlling NOx is often most effective if done from a regional perspective, rather than focusing on the nearest sources.

Ozone

Ozone is not usually emitted directly into the air but in the vicinity of ground-level is created by a chemical reaction between NOx and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust, industrial emissions, gasoline vapors, chemical solvents as well as natural sources emit NOx and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form with the greatest concentrations usually occurring downwind from urban areas. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Because NOx and VOC are ozone precursors, the health effects associated with ozone are also indirect health effects associated with significant levels of NOx and VOC emissions.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes approximately 56 percent of all CO emissions nationwide. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are indoor sources of CO. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath

a layer of warm air. CO is described as having only a local influence because it dissipates quickly. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Sulfur Oxides

Sulfur Oxide (SOx) gases are formed when fuel containing sulfur, such as coal and oil is burned, as well as from the refining of gasoline. SOx dissolves easily in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment.

Lead

Lead is a metal found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is now the primary source of lead emissions to the air. High levels of lead in the air are typically only found near lead smelters, waste incinerators, utilities, and lead-acid battery manufacturers. Exposure of fetuses, infants and children to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Particulate Matter

Particle matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. PM is made up of a number of components including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. Particles that are less than 10 micrometers in diameter (PM10) are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Particles that are less than 2.5 micrometers in diameter (PM2.5) have been designated as a subset of PM10 due to their increased negative health impacts and its ability to remain suspended in the air longer and travel further.

2.2 Other Pollutants of Concern

Toxic Air Contaminants

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least 40 different toxic air contaminants. The most important of these TACs, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and

acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as from accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

TACs are less pervasive in the urban atmosphere than criteria air pollutants, however they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of TACs with varying degrees of toxicity. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

According to *The California Almanac of Emissions and Air Quality 2013 Edition*, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). DPM is a subset of PM2.5 because the size of diesel particles are typically 2.5 microns and smaller. The identification of DPM as a TAC in 1998 led the California Air Resources Board (CARB) to adopt the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles in September 2000. The plan's goals are a 75-percent reduction in DPM by 2010 and an 85-percent reduction by 2020 from the 2000 baseline. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot." Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California's identification of DPM as a toxic air contaminant was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to DPM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's potential airborne cancer risk from combustion sources.

Asbestos

Asbestos is listed as a TAC by CARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in mineral formations and crushing or breaking these rocks, through construction or other means, can release asbestiform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. The nearest likely locations of naturally occurring asbestos, as identified in the *General Location Guide for Ultramafic Rocks in California*, prepared by the California Division of Mines and Geology, is located in Santa Barbara County. The nearest historic asbestos mine to the project site, as identified in the *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California,* prepared by U.S. Geological Survey, is located at Asbestos Mountain, which is approximately 51 miles southeast of the project site in the San Jacinto Mountains. Due to the distance to the nearest natural occurrences of asbestos, the project site is not likely to contain asbestos.

2.3 Greenhouse Gases

Constituent gases of the Earth's atmosphere, called atmospheric greenhouse gases (GHGs), play a critical role in the Earth's radiation amount by trapping infrared radiation from the Earth's surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO_2), methane (CH_4), ozone (O_3), water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic (caused or produced by humans) emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as

global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. Transportation is responsible for 41 percent of the State's greenhouse gas emissions, followed by electricity generation. Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2, where CO_2 is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean. The following provides a description of each of the greenhouse gases and their global warming potential.

Water Vapor

Water vapor is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. The feedback loop in which water is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to "hold" more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there is also dynamics that put the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up).

Carbon Dioxide

The natural production and absorption of CO_2 is achieved through the terrestrial biosphere and the ocean. However, humankind has altered the natural carbon cycle by burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid-1700s, each of these activities has increased in scale and distribution. CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration with the first conclusive measurements being made in the last half of the 20th century. Prior to the industrial revolution, concentrations were fairly stable at 280 parts per million (ppm). The International Panel on Climate Change (IPCC) indicates that concentrations were 379 ppm in 2005, an increase of more than 30 percent. Left unchecked, the IPCC projects that concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources. This could result in an average global temperature rise of at least two degrees Celsius or 3.6 degrees Fahrenheit.

Methane

CH_4 is an extremely effective absorber of radiation, although its atmospheric concentration is less than that of CO_2. Its lifetime in the atmosphere is brief (10 to 12 years), compared to some other GHGs (such as CO_2, N_2O, and Chlorofluorocarbons (CFCs)). CH_4 has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide

Concentrations of N_2O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration of this GHG was documented at 314 parts per billion (ppb). N_2O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. N_2O is also commonly used as an aerosol spray propellant (i.e., in whipped cream bottles, in potato chip bags to keep chips fresh, and in rocket engines and race cars).

Chlorofluorocarbons

CFCs are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the Earth's surface). CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants, and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and in 1989 the European Community agreed to ban CFCs by 2000 and subsequent treaties banned CFCs worldwide by 2010. This effort was extremely successful, and the levels of the major CFCs are now remaining level or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

Hydrofluorocarbons

HFCs are synthetic man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2). Prior to 1990, the only significant emissions were HFC-23. HFC-134a use is increasing due to its use as a refrigerant. Concentrations of HFC-23 and HFC-134a in the atmosphere are now about 10 parts per trillion (ppt) each. Concentrations of HFC-152a are about 1 ppt. HFCs are manmade for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above Earth's surface are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). Concentrations of CF_4 in the atmosphere are over 70 ppt. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing.

Sulfur Hexafluoride

Sulfur Hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 has the highest global warming potential of any gas evaluated; 23,900 times that of CO_2. Concentrations in the 1990s were about 4 ppt. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Aerosols

Aerosols are particles emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning due to the

incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

2.4 Global Warming Potential

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to the reference gas, CO_2. The GHGs listed by the IPCC and the CEQA Guidelines are discussed in this section in order of abundance in the atmosphere. Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources. To simplify reporting and analysis, GHGs are commonly defined in terms of their GWP. The IPCCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2e. The GWP of CO_2 is by definition, 1. The GWP values used in this analysis are based on the IPCC Second Assessment Report (SAR) and United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines, and are detailed in Table A. The SAR GWPs are used in CARB's California inventory and AB32 Scoping Plan estimates.

Table A – Global Warming Potentials, Atmospheric Lifetimes and Abundances of GHGs

Gas	Atmospheric Lifetime (years)[1]	Global Warming Potential (100 Year Horizon)[2]	Atmospheric Abundance
Carbon Dioxide (CO_2)	50-200	1	379 ppm
Methane (CH_4)	9-15	25	1,774 ppb
Nitrous Oxide (N_2O)	114	298	319 ppb
HFC-23	270	14,800	18 ppt
HFC-134a	14	1,430	35 ppt
HFC-152a	1.4	124	3.9 ppt
PFC: Tetrafluoromethane (CF_4)	50,000	7,390	74 ppt
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200	2.9 ppt
Sulfur Hexafluoride (SF_6)	3,200	22,800	5.6 ppt

Notes:
[1] Defined as the half-life of the gas.
[2] Compared to the same quantity of CO_2 emissions and is based on the Intergovernmental Panel On Climate Change (IPCC) 2007 standard, which is utilized in CalEEmod (Version 2016.3.2), which is used in this report (CalEEmod user guide: Appendix A).
Definitions: ppm = parts per million; ppb = parts per billion; ppt = parts per trillion
Source: IPCC 2007, EPA 2015

3.0 AIR QUALITY MANAGEMENT

3.1 Regulatory Setting

The air quality at the project site is addressed through the efforts of various international, federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality are discussed below.

International

In 1988, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to evaluate the impacts of global climate change and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined other countries around the world in signing the United Nations' Framework Convention on Climate Change (UNFCCC) agreement with the goal of controlling GHG emissions. The parties of the UNFCCC adopted the Kyoto Protocol, which set binding GHG reduction targets for 37 industrialized countries, the objective of reducing their collective GHG emissions by five percent below 1990 levels by 2012. The Kyoto Protocol has been ratified by 182 countries, but has not been ratified by the United States. It should be noted that Japan and Canada opted out of the Kyoto Protocol and the remaining developed countries that ratified the Kyoto Protocol have not met their Kyoto targets. The Kyoto Protocol expired in 2012 and the amendment for the second commitment period from 2013 to 2020 has not yet entered into legal force. The Parties to the Kyoto Protocol negotiated the Paris Agreement in December 2015, agreeing to set a goal of limiting global warming to less than 2 degrees Celsius compared with pre-industrial levels. The Paris Agreement has been adopted by 195 nations with 147 ratifying it, including the United States by President Obama, who ratified it by Executive Order on September 3, 2016. On June 1, 2017, President Trump announced that the United States is withdrawing from the Paris Agreement, however the Paris Agreement is still legally binding by the other remaining nations.

Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere—CFCs, halons, carbon tetrachloride, and methyl chloroform—were to be phased out, with the first three by the year 2000 and methyl chloroform by 2005.

Federal – United States Environmental Protection Agency

The Clean Air Act, first passed in 1963 with major amendments in 1970, 1977 and 1990, is the overarching legislation covering regulation of air pollution in the United States. The Clean Air Act has established the mandate for requiring regulation of both mobile and stationary sources of air pollution at the state and federal level. The Environmental Protection Agency (EPA) was created in 1970 in order to consolidate research, monitoring, standard-setting and enforcement authority into a single agency.

The EPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. NAAQS pollutants were identified using medical evidence and are shown below in Table B.

Table B – State and Federal Criteria Pollutant Standards

Air Pollutant	Concentration / Averaging Time		Most Relevant Effects
	California Standards	Federal Primary Standards	
Ozone (O_3)	0.09 ppm / 1-hour 0.07 ppm / 8-hour	0.070 ppm, / 8-hour	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage.
Carbon Monoxide (CO)	20.0 ppm / 1-hour 9.0 ppm / 8-hour	35.0 ppm / 1-hour 9.0 ppm / 8-hour	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO_2)	0.18 ppm / 1-hour 0.030 ppm / annual	100 ppb / 1-hour 0.053 ppm / annual	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO_2)	0.25 ppm / 1-hour 0.04 ppm / 24-hour	75 ppb / 1-hour 0.14 ppm/annual	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM_{10})	50 µg/m^3 / 24-hour 20 µg/m^3 / annual	150 µg/m^3 / 24-hour	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in elderly.
Suspended Particulate Matter ($PM_{2.5}$)	12 µg/m^3 / annual	35 µg/m^3 / 24-hour 12 µg/m^3 / annual	
Sulfates	25 µg/m^3 / 24-hour	No Federal Standards	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and (f) Property damage.
Lead	1.5 µg/m^3 / 30-day	0.15 µg/m^3 /3-month rolling	(a) Learning disabilities; and (b) Impairment of blood formation and nerve conduction.
Visibility Reducing Particles	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more due to particles when relative humidity is less than 70 percent.	No Federal Standards	Visibility impairment on days when relative humidity is less than 70 percent.

Source: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf .

As part of its enforcement responsibilities, the EPA requires each state with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the national standards. The SIP must integrate federal, state, and local components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based

programs within the timeframe identified in the SIP. The CARB defines attainment as the category given to an area with no violations in the past three years. As indicated below in Table C, the Air Basin has been designated by EPA for the national standards as a non-attainment area for ozone (O_3) and suspended particulates (PM10 and PM2.5) and partial non-attainment for lead. Currently, the Air Basin is in attainment with the national ambient air quality standards for carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2).

Table C – South Coast Air Basin Attainment Status

Criteria Pollutant	Standard	Averaging Time	Designation[a)]	Attainment Date[b)]
1-Hour Ozone	NAAQS	1979 1-Hour (0.12 ppm)	Nonattainment (Extreme)	2/6/2023 Originally 11/15/2010 (not attained)[c)]
	CAAQS	1-Hour (0.09 ppm)	Nonattainment	N/A
8-Hour Ozone[d)]	NAAQS	1997 8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
	NAAQS	2008 8-Hour (0.075 ppm)	Nonattainment (Extreme)	7/20/2032
	NAAQS	2015 8-Hour (0.070 ppm)	Designations Pending	~2037
	CAAQS	8-Hour (0.070 ppm)	Nonattainment	Beyond 2032
CO	NAAQS	1-Hour (35 ppm) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
	CAAQS	1-Hour (20 ppm) 8-Hour (9 ppm)	Attainment	6/11/2007 (attained)
NO_2[e)]	NAAQS	1-Hour (0.10 ppm)	Unclassifiable/ Attainment	N/A (attained)
	NAAQS	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
	CAAQS	1-Hour (0.18 ppm) Annual (0.030 ppm)	Attainment	---
SO_2[f)]	NAAQS	1-Hour (75 ppb)	Designations Pending (expect Unclassifiable/ Attainment)	N/A (attained)
	NAAQS	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/ Attainment	3/19/1979 (attained)
PM10	NAAQS	1987 24-hour (150 µg/m^3)	Attainment (Maintenance)[g)]	7/26/2013 (attained)
	CAAQS	24-hour (50 µg/m^3) Annual (20 µg/m^3)	Nonattainment	N/A
PM2.5[h)]	NAAQS	2006 24-Hour (35 µg/m^3)	Nonattainment (Serious)	12/31/2019
	NAAQS	1997 Annual (15.0 µg/m^3)	Nonattainment	4/5/2015
	NAAQS	2012 Annual (12.0 µg/m^3)	Nonattainment (Serious)	12/31/2025
	CAAQS	Annual (12.0 µg/m^3)	Nonattainment	N/A
Lead	NAAQS	3-Months Rolling (0.15 µg/m^3)	Nonattainment (Partial)	12/31/2015

Source: SCAQMD, February 2016
Notes:
a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable
b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration
c) 1-hour O_3 standard (0.12 ppm) was revoked, effective June 15, 2005; however, the Basin has not attained this standard based on 2008-2010 data and is still subject to anti-backsliding requirements

d) 1997 8-hour O_3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the revoked 1997 O_3 standard is still subject to anti-backsliding requirements
e) New NO_2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO2 standard retained
f) The 1971 annual and 24-hour SO_2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard. Area designations are still pending, with Basin expected to be designated Unclassifiable /Attainment.
g) Annual PM10 standard was revoked, effective December 18, 2006; 24-hour PM10 NAAQS deadline was 12/31/2006; SCAQMD request for attainment redesignation and PM10 maintenance plan was approved by U.S. EPA on June 26, 2013, effective July 26, 2013.
h) Attainment deadline for the 2006 24-Hour PM2.5 NAAQS (designation effective December 14, 2009) is December 31, 2019 (end of the 10th calendar year after effective date of designations for Serious nonattainment areas). Annual PM2.5 standard was revised on January 15, 2013, effective March 18, 2013, from 15 to 12 $\mu g/m^3$. Designations effective April 15, 2015, so Serious area attainment deadline is December 31, 2025.
i) Partial Nonattainment designation – Los Angeles County portion of Basin only for near-source monitors. Expect to remain in attainment based on current monitoring data.

In 2011, the Air Basin exceeded federal standards for either ozone or PM2.5 at one or more locations on a total of 124 days, based on the current federal standards for 8-hour ozone and 24-hour PM2.5. Despite substantial improvements in air quality over the past few decades, some air monitoring stations in the Air Basin still exceed the NAAQS for ozone more frequently than any other stations in the U.S. In 2011, three of the top five stations that exceeded the 8-hour ozone NAAQS were located in the Air Basin (Central San Bernardino Mountains, East San Bernardino Valley, and Metropolitan Riverside County). (SCAQMD 2012)

PM2.5 in the Air Basin has improved significantly in recent years, with 2010 and 2011 being the cleanest years on record. In 2011, only one station in the Air Basin (Metropolitan Riverside County at Mira Loma) exceeded the annual PM2.5 NAAQS and the 98th percentile form of the 24-hour PM2.5 NAAQS, as well as the 3-year design values for these standards. Basin-wide, the federal PM2.5 24-hour standard level was exceeded in 2011 on 17 sampling days. (SCAQMD 2012)

The Air Basin is currently in attainment for the federal standards for NO_2. While the concentration level of the new 1-hour NO_2 federal standard (100 ppb) was exceeded in the Air Basin at two stations (Central Los Angeles and Long Beach) on the same day in 2011, the NAAQS NO_2 design value has not been exceeded. (SCAQMD 2012) Therefore, the Basin remains in attainment of the NO_2 NAAQS.

Although much of the South Coast Air Basin, including the proposed site location of Riverside County, is in attainment for lead, the EPA designated the Los Angeles County portion of the Air Basin as nonattainment for the revised (2008) federal lead standard (0.15 $\mu g/m^3$, rolling 3-month average). This was due to the addition of source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in Vernon and the City of Industry exceeding the revised standard in the 2007-2009 period of data used. As of the 2009-2011 data period, only one of these stations (Vernon) still exceeded the lead standard. The *2012 Lead State Implementation Plan Los Angeles County*, prepared by SCAQMD and adopted on May 4, 2012, provided measures to meet attainment of lead by December 31, 2015. Current monitoring data shows that lead is now below the standards at all monitoring stations, however it will take three years of meeting the standards before Los Angeles County can request to be re-designated by the EPA.

In Massachusetts v. Environmental Protection Agency (Docket No. 05–1120), argued November 29, 2006 and decided April 2, 2007, the U.S. Supreme Court held that not only did the EPA have authority to regulate greenhouse gases, but the EPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the EPA should be required to regulate CO_2 and other greenhouse gases as pollutants under the federal Clean Air Act (CAA).

In response to the FY2008 Consolidations Appropriations Act (H.R. 2764; Public Law 110-161), EPA proposed a rule on March 10, 2009 that requires mandatory reporting of GHG emissions from large sources in the United States. On September 22, 2009, the Final Mandatory Reporting of GHG Rule was

signed and published in the Federal Register on October 30, 2009. The rule became effective on December 29, 2009. This rule requires suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions to submit annual reports to EPA.

On December 7, 2009, the EPA Administrator signed two distinct findings under section 202(a) of the Clean Air Act. One is an endangerment finding that finds concentrations of the six GHGs in the atmosphere threaten the public health and welfare of current and future generations. The other is a cause or contribute finding, that finds emissions from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare. These actions did not impose any requirements on industry or other entities, however, since 2009 the EPA has been providing GHG emission standards for vehicles and other stationary sources of GHG emissions that are regulated by the EPA. On September 13, 2013 the EPA Administrator signed 40 CFR Part 60, that limits emissions from new sources to 1,100 pounds of CO_2 per MWh for fossil fuel-fired utility boilers and 1,000 pounds of CO_2 per MWh for large natural gas-fired combustion units.

On August 3, 2015, the EPA announced the Clean Power Plan, emissions guidelines for U.S. states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired power plants (Federal Register Vol. 80, No. 205, October 23 2015). On February 9, 2016 the Supreme Court stayed implementation of the Clean Power Plan due to a legal challenge from 29 states and in April 2017, the Supreme Court put the case on hold and directed both sides to make arguments for whether it should keep the case on hold indefinitely or close it and remand the issue to the EPA. On August 21, 2018 the EPA released the Affordable Clean Energy Rule, which usurps the Clean Power plan and returns most of the decision making authority for power plant emissions back to the States.

State – California Air Resources Board

The California Air Resources Board (CARB), which is a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. The CAAQS for criteria pollutants are shown above in Table B. In addition, the CARB establishes emission standards for motor vehicles sold in California, consumer products (e.g. hairspray, aerosol paints, and barbeque lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

The Air Basin has been designated by the CARB as a non-attainment area for ozone, PM10, PM2.5 and lead. Currently, the South Coast Air Basin is in attainment with the ambient air quality standards for CO, NO_2, SO_2, and sulfates and is unclassified for visibility reducing particles and Hydrogen Sulfide.

In 2008 the CARB adopted Resolution 08-43, which limits NOx, PM10 and PM2.5 emissions from on-road diesel truck fleets that operate in California. In 2009 Executive Order R-09-010 was adopted that codified Resolution 08-43 into Section 2025, title 13 of the California Code of Regulations. This regulation requires that by the year 2023 all commercial diesel trucks that operate in California shall meet model year 2010 (Tier 4 Final) or latter emission standards. In the interim period, this regulation provides annual interim targets for fleet owners to meet. This regulation also provides a few exemptions including a onetime per year 3-day pass for trucks registered outside of California.

CARB is also responsible for regulations pertaining to Toxic Air Contaminants (TACs). The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588, 1987, Connelly) was enacted in

1987 as a means to establish a formal air toxics emission inventory risk quantification program. AB 2588, as amended, establishes a process that requires stationary sources to report the type and quantities of certain substances their facilities routinely release in California. The data is ranked by high, intermediate, and low categories, which are determined by: the potency, toxicity, quantity, volume, and proximity of the facility to nearby receptors.

CARB also proposed interim statewide CEQA thresholds for GHG emissions and released *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act,* on October 24, 2008 that has been utilized by the SCAQMD's GHG Significance Threshold Stakeholder Working Group in their framework for developing SCAQMD's draft GHG emissions thresholds. The State currently has no regulations that establish ambient air quality standards for GHGs. However, the State has passed laws directing CARB to develop actions to reduce GHG emissions, which are listed below.

Executive Order B-30-15, Senate Bill 32 and Assembly Bill 197

The California Governor issued Executive Order B-30-15 on April 29, 2015 that aims to reduce California's GHG emissions 40 percent below 1990 levels by 2030. This executive order aligns California's GHG reduction targets with those of other international governments, such as the European Union that set the same target for 2030 in October, 2014. This target will make it possible to reach the ultimate goal of reducing GHG emissions 80 percent under 1990 levels by 2050 that is based on scientifically established levels needed in the U.S.A to limit global warming below 2 degrees Celsius – the warming threshold at which scientists say there will likely be major climate disruptions such as super droughts and rising sea levels. Assembly Bill 197 (AB 197) (September 8, 2016) and Senate Bill 32 (SB 32) (September 8, 2016) codified into statute the GHG emissions reduction targets of at least 40 percent below 1990 levels by 2030 as detailed in EO B-30-15. AB 197 also requires additional GHG emissions reporting that is broken down to sub-county levels and requires CARB to consider the social costs of emissions impacting disadvantaged communities.

Executive Order B-29-15

The California Governor issued Executive Order B-29-15 on April 1, 2015 and directed the State Water Resources Control Board to impose restrictions to achieve a statewide 25% reduction in urban water usage and directed the Department of Water Resources to replace 50 million square feet of lawn with drought tolerant landscaping through an update to the State's Model Water Efficient Landscape Ordinance. The Ordinance also requires installation of more efficient irrigation systems, promotion of greywater usage and onsite stormwater capture, and limits the turf planted in new residential landscapes to 25 percent of the total area and restricts turf from being planted in median strips or in parkways unless the parkway is next to a parking strip and a flat surface is required to enter and exit vehicles. Executive Order B-29-15 would reduce GHG emissions associated with the energy used to transport and filter water.

Assembly Bill 1109

California Assembly Bill 1109 (AB 1109), which also known as the Lighting Efficiency and Toxics Reduction Act, prohibits the manufacturing of lights after January 1, 2010 that contain levels of hazardous substances prohibited by the European Union pursuant to the RoHS Directive. AB 1109 also requires reductions in energy usage for lighting and is structured to reduce lighting electrical consumption by: (1) At least 50 percent reduction from 2007 levels for indoor residential lighting; and (2) At least 25 percent reduction from 2007 levels for indoor commercial and all outdoor lighting by 2018. AB 1109 would reduce GHG emissions through reducing the amount of electricity required to be generated by fossil fuels in California.

Assembly Bill 1493

California Assembly Bill 1493 (also known as the Pavley Bill, in reference to its author Fran Pavley) was enacted on July 22, 2002 and required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. In 2004, CARB approved the "Pavley I" regulations limiting the amount of GHGs that may be released from new passenger automobiles that are being phased in between model years 2009 through 2016. These regulations will reduce GHG emissions by 30 percent from 2002 levels by 2016. The second set of regulations "Pavley II" is currently in development and will be phased in between model years 2017 through 2025 and will reduce emissions by 45 percent by the year 2020 as compared to the 2002 fleet. The Pavley II standards are being developed by linking the GHG emissions and formerly separate toxic tailpipe emissions standards previously known as the "LEV III" (third stage of the Low Emission Vehicle standards) into a single regulatory framework. The new rules reduce emissions from gasoline-powered cars as well as promote zero-emissions auto technologies such as electricity and hydrogen, and through increasing the infrastructure for fueling hydrogen vehicles. In 2009, the U.S. EPA granted California the authority to implement the GHG standards for passenger cars, pickup trucks and sport utility vehicles. In September 2009, the Pavley I regulations were adopted by CARB.

Executive Order S-3-05

In 2005 the California Governor issued Executive Order S 3-05, GHG Emission, which established the following reduction targets:

- 2010: Reduce greenhouse gas emissions to 2000 levels;
- 2020: Reduce greenhouse gas emissions to 1990 levels;
- 2050: Reduce greenhouse gas emissions to 80 percent below 1990 levels.

The executive order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. To comply with the Executive Order, the secretary of CalEPA created the California Climate Action Team (CAT), made up of members from various state agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of businesses, local governments, and communities and through State incentive and regulatory programs. The State achieved its first goal of reducing greenhouse gas emissions to 2000 levels by 2010.

Assembly Bill 32

In 2006, the California State Legislature adopted Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006. AB 32 requires CARB, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020 through an enforceable statewide emission cap which will be phased in starting in 2012. Emission reductions shall include carbon sequestration projects that would remove carbon from the atmosphere and utilize best management practices that are technologically feasible and cost effective.

In 2007 CARB released the calculated Year 1990 GHG emissions of 431 million metric tons of CO2e ($MMTCO_2e$). The 2020 target of 431 $MMTCO_2e$ requires the reduction of 78 $MMTCO_2e$, or approximately 16 percent from the State's projected 2020 business as usual emissions of 509 $MMTCO_2e$ (CARB, 2014). Under AB 32, CARB was required to adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 cap by 2020. Early measures CARB took to lower GHG emissions included requiring operators of the largest industrial facilities that emit 25,000 metric tons of CO_2 in a calendar year to submit verification of GHG emissions by December 1, 2010. The CARB Board also approved nine discrete early action measures that include regulations affecting landfills, motor vehicle

fuels, refrigerants in cars, port operations and other sources, all of which became enforceable on or before January 1, 2010.

CARB's Scoping Plan that was adopted in 2009, proposes a variety of measures including: strengthening energy efficiency and building standards; targeted fees on water and energy use; a market-based cap-and-trade system; achieving a 33 percent renewable energy mix; and a fee regulation to fund the program. The 2014 update to the Scoping Plan identifies strategies moving beyond the 2020 targets to the year 2050. The California's 2017 Climate Change Scoping Plan that was adopted in November 2017, is the second update to the Scoping Plan and provides specific statewide policies and measures to achieve the 2030 GHG reduction targets adopted in AB 197 and SB 32 as well as the aspirational 2050 reduction target provided in Executive Order B-30-15.

The Cap and Trade Program established under the Scoping Plan sets a statewide limit on sources responsible for 85 percent of California's GHG emissions, and has established a market for long-term investment in energy efficiency and cleaner fuels since 2012.

Senate Bill 1368

Senate Bill 1368 (SB 1368) is the companion Bill of AB 32 and was adopted September 2006. SB 1368 requires that the California Public Utilities Commission (CPUC) establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007 and for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas-fired plant. Furthermore, the legislation states that all electricity provided to the State, including imported electricity, must be generated by plants that meet the standards set by CPUC and California Energy Commission (CEC).

Executive Order S-1-07

Executive Order S-1-07 was issued in 2007 and proclaims that the transportation sector is the main source of GHG emissions in the State, since it generates more than 40 percent of the State's GHG emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in the State by at least ten percent by 2020. This Order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

In 2009 CARB approved the proposed regulation to implement the low carbon fuel standard. The standard was challenged in the courts, but has been in effect since 2011 and was re-approved by the CARB in 2015. The low carbon fuel standard is anticipated to reduce GHG emissions by about 16 MMT per year by 2020. The low carbon fuel standard is designed to provide a framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet annually. Reformulated gasoline mixed with corn-derived ethanol and low-sulfur diesel fuel represent the baseline fuels. Lower carbon fuels may be ethanol, biodiesel, renewable diesel, or blends of these fuels with gasoline or diesel. Compressed natural gas and liquefied natural gas also may be low-carbon fuels. Hydrogen and electricity, when used in fuel cells or electric vehicles, are also considered as low-carbon fuels.

Senate Bill 97

Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG

emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify and adopt those guidelines by January 1, 2010.

Pursuant to the requirements of SB 97 as stated above, on December 30, 2009 the Natural Resources Agency adopted amendments to the State CEQA guidelines that address GHG emissions. The CEQA Guidelines Amendments changed 14 sections of the CEQA Guidelines and incorporated GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance were provided and no specific mitigation measures were identified. The GHG emission reduction amendments went into effect on March 18, 2010 and are summarized below:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

Senate Bill 350

Senate Bill 350 (SB 350) was adopted October 2015 in order to implement the goals of Executive Order B-30-15. SB 350 increases the State's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. In addition SB 350 requires the State to double statewide energy efficiency savings for both electricity and natural gas uses by 2030. SB 350 is being implemented by requiring all large utilities to develop and submit Integrated Resource Plans that detail how they will meet their customers energy needs, reduce GHG emissions and deploy clean energy resources. SB 350 superseded the renewable energy requirements set by SB 1078, SB 107, and SB X1-2.

Senate Bill 375

Senate Bill 375 (SB 375) was adopted September 2008 in order to support the State's climate action goals to reduce GHG emissions through coordinated regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires CARB to set regional

targets for GHG emissions reductions from passenger vehicle use. In 2010, CARB established targets for 2020 and 2035 for each Metropolitan Planning Organizations (MPO) within the State. It was up to each MPO to adopt a sustainable communities strategy (SCS) that will prescribe land use allocation in that MPOs Regional Transportation Plan (RTP) to meet CARB's 2020 and 2035 GHG emission reduction targets. These reduction targets are required to be updated every eight years and in June 2017 CARB released *Staff Report Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Target*, which provides recommended GHG emissions reduction targets for SCAG of 8 percent by 2020 and 21 percent by 2035.

The *2016-2040 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS), adopted by SCAG April, 2016 provides a 2020 GHG emission reduction target of 8 percent and a 2035 GHG emission reduction target of 18 percent. SCAG will need to develop additional strategies in its next revision of the RTP/SCS in order to meet CARB's new 21 percent GHG emission reduction target for 2035. CARB is also charged with reviewing SCAG's RTP/SCS for consistency with its assigned targets.

City and County land use policies, including General Plans, are not required to be consistent with the RTP and associated SCS. However, new provisions of CEQA incentivize, through streamlining and other provisions, qualified projects that are consistent with an approved SCS and categorized as "transit priority projects."

Assembly Bill 341 and Senate Bills 939 and 1374

Senate Bill 939 (SB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board to adopt a model ordinance by March 1, 2004 suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills. Assembly Bill 341 (AB 341) was adopted in 2011 and builds upon the waste reduction measures of SB 939 and 1374, and sets a new target of a 75 percent reduction in solid waste generated by the year 2020.

California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

Title 24 standards are updated on a three-year schedule and the most current 2016 standards went into effect on January 1, 2017. The Title 24 standards require the installation of insulated hot water pipes, improved window performance, improved wall insulation, and mandatory duct sealing. Title 24 also requires roofs to be constructed to be solar ready, with cool roofing shingles, a minimum 1-inch air space between roof material and roof deck, and a minimum of R-22 roof/ceiling insulation. All lighting is required to be high efficiency and daylight sensors and motion sensors are required for outdoor lighting, bathrooms, utility rooms and other spaces. The forced air systems are required to limit leakage to 5 percent or less and requires all heat pump systems to be equipped with liquid line filter driers. The 2016 Title 24 Part 6 standards are anticipated to reduce electricity consumption by 281 gigawatt-hours per year and natural gas consumption by 16 million therms per year (http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf).

California Code of Regulations (CCR) Title 24, Part 11

CCR Title 24, Part 11: *California Green Building Standards* (Title 24) was developed in response to continued efforts to reduce GHG emissions associated with energy consumption. The most current version is the 2016 California Green Building Standards Code (CalGreen), which became effective on January 1, 2017 and replaced the 2013 CalGreen.

The CALGreen Code contains requirements for construction site selection; storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for verifying that all building systems (e.g., heating and cooling equipment and lighting systems) are functioning at their maximum efficiency.

The CALGreen Code provides standards for bicycle parking, carpool/vanpool/electric vehicle spaces, light and glare reduction, grading and paving, energy efficient appliances, renewable energy, graywater systems, water efficient plumbing fixtures, recycling and recycled materials, pollutant controls (including moisture control and indoor air quality), acoustical controls, storm water management, building design, insulation, flooring, and framing, among others. Implementation of the CALGreen Code measures reduces energy consumption and vehicle trips and encourages the use of alternative-fuel vehicles, which reduces pollutant emissions.

Some of the notable changes in the 2016 CALGreen Code over the prior 2013 CALGreen Code include: an increase in amount of bicycle parking requirements; an increase in number of EV charging stations and clean air vehicle parking at non-residential buildings; a reduction in water usage in urinals to 0.125 gallons per flush; an increased rate of diversion for construction and operational waste to 65 percent as well as adding organic waste as waste to be diverted; and a requirement for fireplaces to meet new EPA standards.

Regional

The SCAQMD is the agency principally responsible for comprehensive air pollution control in the South Coast Air Basin. To that end, as a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), county transportation commissions, and local governments and cooperates actively with all federal and state agencies.

South Coast Air Quality Management District

SCAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emission sources, and enforces such measures through educational programs or fines, when necessary. SCAQMD is directly responsible for reducing emissions from stationary, mobile, and indirect sources. It has responded to this requirement by preparing a sequence of AQMPs. The *Final 2016 Air Quality Management Plan* (2016 AQMP) was adopted by the SCAQMD Board on March 3, 2016 and was adopted by CARB on March 23, 2017 for inclusion into the California State Implementation Plan (SIP). The 2016 AQMP was prepared in order to meet the following standards:

- 8-hour Ozone (75 ppb) by 2032
- Annual PM2.5 (12 µg/m3) by 2021-2025
- 8-hour Ozone (80 ppb) by 2024 (updated from the 2007 and 2012 AQMPs)
- 1-hour Ozone (120 ppb) by 2023 (updated from the 2012 AQMP)
- 24-hour PM2.5 (35 µg/m3) by 2019 (updated from the 2012 AQMP)

In addition to meeting the above standards, the 2016 AQMP also includes revisions to the attainment demonstrations for the 1997 8-hour ozone NAAQS and the 1979 1-hour ozone NAAQS. The prior 2012 AQMP was prepared in order to demonstrate attainment with the 24-hour PM2.5 standard by 2014 through adoption of all feasible measures. The prior 2007 AQMP demonstrated attainment with the 1997 8-hour ozone (80 ppb) standard by 2023, through implementation of future improvements in control techniques and technologies. These "black box" emissions reductions represent 65 percent of the remaining NOx emission reductions by 2023 in order to show attainment with the 1997 8-hour ozone NAAQS. Given the magnitude of these needed emissions reductions, additional NOx control measures have been provided in the 2012 AQMP even though the primary purpose was to show compliance with 24-hour PM2.5 emissions standards.

The 2016 AQMP provides a new approach that focuses on available, proven and cost effective alternatives to traditional strategies, while seeking to achieve multiple goals in partnership with other entities to promote reductions in GHG emissions and TAC emissions as well as efficiencies in energy use, transportation, and goods movement. The 2016 AQMP recognizes the critical importance of working with other agencies to develop funding and other incentives that encourage the accelerated transition of vehicles, buildings and industrial facilities to cleaner technologies in a manner that benefits not only air quality, but also local businesses and the regional economy.

Although SCAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate air quality issues associated with plans and new development projects throughout the Air Basin. Instead, this is controlled through local jurisdictions in accordance to the California Environmental Quality Act (CEQA). In order to assist local jurisdictions with air quality compliance issues the *CEQA Air Quality Handbook* (SCAQMD CEQA Handbook), prepared by SCAQMD, 1993, with the most current updates found at http://www.aqmd.gov/ceqa/hdbk.html, was developed in accordance with the projections and programs detailed in the AQMPs. The purpose of the SCAQMD CEQA Handbook is to assist Lead Agencies, as well as consultants, project proponents, and other interested parties in evaluating a proposed project's potential air quality impacts. Specifically, the SCAQMD CEQA Handbook explains the procedures that SCAQMD recommends be followed for the environmental review process required by CEQA. The SCAQMD CEQA Handbook provides direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. The SCAQMD intends that by providing this guidance, the air quality impacts of plans and development proposals will be analyzed accurately and consistently throughout the Air Basin, and adverse impacts will be minimized.

SCAQMD Working Group

Since neither CARB nor the OPR has developed GHG emissions threshold, the SCAQMD formed a Working Group to develop significance thresholds related to GHG emissions. At the September 28, 2010 Working Group meeting, the SCAQMD released its most current version of the draft GHG emissions thresholds, which recommends a tiered approach that either provides a quantitative annual thresholds of 3,500 $MTCO_2e$ for residential uses, 1,400 $MTCO_2e$ for commercial uses, and 3,000 $MTCO_2e$ for mixed uses. An alternative annual threshold of 3,000 $MTCO_2e$ for all land use types is also proposed.

Southern California Association of Governments

The SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development and the environment. SCAG is the federally designated Metropolitan Planning Organization (MPO) for the majority of the southern California region and is the largest MPO in the nation. With respect to air quality planning, SCAG has prepared the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), adopted April, 2016 and the *2015 Federal*

Transportation Improvement Program (FTIP), adopted October 2013, which addresses regional development and growth forecasts. Although the RTP/SCS and FTIP are primarily planning documents for future transportation projects a key component of these plans are to integrate land use planning with transportation planning that promotes higher density infill development in close proximity to existing transit service. These plans form the basis for the land use and transportation components of the AQMP, which are utilized in the preparation of air quality forecasts and in the consistency analysis included in the AQMP. The RTP/SCS, FTIP, and AQMP are based on projections originating within the City and County General Plans.

Local – City of Lake Elsinore

Local jurisdictions, such as the County of Riverside, have the authority and responsibility to reduce air pollution through its police power and decision-making authority. Specifically, the City is responsible for the assessment and mitigation of air emissions resulting from its land use decisions. The City is also responsible for the implementation of transportation control measures as outlined in the 2007 AQMP and 2012 AQMP. Examples of such measures include bus turnouts, energy-efficient streetlights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation.

In accordance with the CEQA requirements, the City does not, however, have the expertise to develop plans, programs, procedures, and methodologies to ensure that air quality within the City and region will meet federal and state standards. Instead, the City relies on the expertise of the SCAQMD and utilizes the SCAQMD CEQA Handbook as the guidance document for the environmental review of plans and development proposals within its jurisdiction.

The City of Lake Elsinore General Plan contains the following air quality-related goals and policies that are applicable to the proposed project:

Goal 2 Work with regional and state governments to develop effective mitigation measures to improve air quality.

Policy 2.1 Support the SCAQMD in its development of improved ambient air quality monitoring capabilities and establishment of standards, thresholds, and rules to address, and where necessary mitigate, the air quality impacts of new development.

4.0 ATMOSPHERIC SETTING

4.1 Regional – Western Riverside County

The project site is located within the western portion of Riverside County, which is part of the South Coast Air Basin (Air Basin) that includes the non-desert portions of Riverside, San Bernardino, and Los Angeles Counties and all of all of Orange County. Temperature inversions are the prime factor in the accumulation of contaminants in the Air Basin. The mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds. The topography and climate of Southern California combine to create an area of high air pollution potential in the Air Basin. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cup over the cool marine layer, which prevents pollution from dispersing upward. This inversion allows pollutants to accumulate within the lower layer. Light winds during the summer further limit ventilation from occurring.

Due to the low average wind speeds in the summer and a persistent daytime temperature inversion, emissions of hydrocarbons and oxides of nitrogen have an opportunity to combine with sunlight in a complex series of reactions. These reactions produce a photochemical oxidant commonly known as smog. Since the Air Basin experiences more days of sunlight than any other major urban area in the United States, except Phoenix, the smog potential in the region is higher than in most other areas of the nation.

4.2 Local – Lake Elsinore

The major factors affecting local air pollution conditions in the Lake Elsinore planning area are the extent and types of both region-wide and local emissions, climate, and meteorology. The general climate of Lake Elsinore is characterized by sparse winter rainfall and hot summers tempered by cool ocean breezes. The climate in and around Lake Elsinore, as well as most of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. This high-pressure cell produces a typical Mediterranean climate with warm summers, mild winters, and moderate rainfall. This pattern is infrequently interrupted by periods of extremely hot weather brought in by Santa Ana winds. Most of the area's precipitation occurs intermittently between November and April; the area is still dominated by sunny or partly sunny conditions during these months. Cyclic land and sea breezes are the primary factors affecting the region's mild climate. The daytime winds are normally sea breezes, predominantly from the west, that flow at relatively low velocities.

Just south of Lake Elsinore, the Lake Elsinore Convergence Zone acts as an invisible boundary that obstructs much of the inland basin air pollutants from continuing south beyond the Lake Elsinore area. Coastal winds within the Lake Elsinore Convergence Zone are a primary factor for the obstruction. They allow air pollutants to be dispersed just south of the convergence zone and accumulate within the Lake Elsinore area, including surrounding communities to the north and east.

The temperature and precipitation levels for Lake Elsinore is shown below in Table D and is based on the average of data from March 10, 1897 to January 20, 2015. Table D shows that August is typically the warmest month and January is typically the coolest month. Rainfall in the project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers being almost completely dry.

Table D – Monthly Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Max. Temperature	65.4	67.5	71.0	76.3	81.8	90.5	98.1	98.1	93.5	83.7	74.1	66.9
Average Min. Temperature	36.4	38.7	41.2	44.7	49.8	54.1	59.4	59.8	55.8	48.8	41.1	36.5
Average Total Precipitation (in.)	2.47	2.54	2.03	0.75	0.23	0.02	0.08	0.12	0.26	0.51	0.99	2.01

Source: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca2805

4.3 Monitored Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the Air Basin. Estimates of the existing emissions in the Air Basin provided in the 2012 AQMP, indicate that collectively, mobile sources account for 59 percent of the VOC, 88 percent of the NOx emissions and 40 percent of directly emitted PM2.5, with another 10 percent of PM2.5 from road dust.

SCAQMD has divided the Air Basin into 38 air-monitoring areas. The project site is located in Air Monitoring Area 25, which covers Lake Elsinore. The nearest air monitoring station to the project site is the is the Lake Elsinore-West Flint Street Monitoring Station (Lake Elsinore Station), which is located approximately 1.6 miles southeast of the project site at 506 West Flint Street, Lake Elsinore. However, it should be noted that due to the air monitoring station's distance from the project site, recorded air pollution levels at the Lake Elsinore Station reflect with varying degrees of accuracy, local air quality conditions at the project site. It should also be noted that CO measurements have not been provided, since CO is currently in attainment in the Air Basin and monitoring of CO within the Air Basin ended on March 31, 2013.

The monitoring data from the Lake Elsinore Station is presented in Table E and shows the most recent three years of monitoring data from CARB. Table E shows that ozone and particulate matter (PM10 and PM2.5) are the air pollutants of primary concern in the project area, which are detailed below:

Ozone

The State 1-hour concentration standard for ozone has been exceeded between 4 and 18 days each year over the past three years at the Lake Elsinore Station. The State 8-hour ozone standard has been exceeded between 13 and 44 days each year over the past three years at the Lake Elsinore Station. The Federal 8-hour ozone standard has been exceeded between 13 and 35 days each year over the past three years at the Lake Elsinore Station.

Ozone is a secondary pollutant as it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO_2, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Many areas of Southern California contribute to the ozone levels experienced at this monitoring station, with the more significant areas being those directly upwind.

Nitrogen Dioxide

The Lake Elsinore Station did not record an exceedance of the Federal 1-hour NO_2 standard for the last three years.

Table E – Local Area Air Quality Monitoring Summary

Pollutant (Standard)	Year[1] 2014	2015	2016
Ozone:			
Maximum 1-Hour Concentration (ppm)	0.104	0.131	0.124
Days > CAAQS (0.09 ppm)	**4**	**18**	**15**
Maximum 8-Hour Concentration (ppm)	0.087	0.099	0.094
Days > NAAQS (0.070 ppm)	**13**	**31**	**44**
Days > CAAQs (0.070 ppm)	**13**	**35**	**45**
Nitrogen Dioxide:			
Maximum 1-Hour Concentration (ppb)	45.3	47.2	51.3
Days > NAAQS (100 ppb)	0	0	0
Inhalable Particulates (PM10):			
Maximum 24-Hour California Measurement (ug/m^3)	86.8	90.7	65.4
Days > NAAQS (150 ug/m^3)	0	0	0
Days > CAAQS (50 ug/m^3)	ND	ND	ND
Annual Arithmetic Mean (AAM) (ug/m^3)	26.0	20.1	20.2
Annual > NAAQS (50 ug/m^3)	No	No	No
Annual > CAAQS (20 ug/m^3)	**Yes**	**Yes**	**Yes**
Ultra-Fine Particulates (PM2.5):			
Maximum 24-Hour National Measurement (ug/m^3)	33.7	42.2	26.2
Days > NAAQS (35 ug/m^3)	ND	ND	ND
Annual Arithmetic Mean (AAM) (ug/m^3)	11.8	ND	ND
Annual > NAAQS and CAAQS (12 ug/m^3)	No	ND	ND

Notes: Exceedances are listed in **bold.** CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million; ppb = parts per billion; ND = no data available.
[1] Data obtained from the Lake Elsinore Station.
Source: http://www.arb.ca.gov/adam/

Particulate Matter

It is not clear whether the State 24-hour concentration standard for PM10 has been exceeded as there is no data for the last three years at the Lake Elsinore Station. Over the past three years the Federal 24-hour standard for PM10 has not been exceeded at the Lake Elsinore Station. The annual PM10 concentration at the Lake Elsinore Station has exceeded the State standard for the past three years and has not exceeded the Federal standard for the past three years.

Over the past three years there has been no data for the 24-hour concentration standard for PM2.5 at the Lake Elsinore Station. The annual PM2.5 concentration at the Lake Elsinore Station has not exceeded the State or Federal standard for the past three years. There does not appear to be a noticeable trend for PM10 or PM2.5 in either maximum particulate concentrations or days of exceedances in the area. Particulate levels in the area are due to natural sources, grading operations, and motor vehicles.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM10 and PM2.5). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths during exercise.

4.4 Toxic Air Contaminant Levels in the Air Basin

In order to determine the Air Basin-wide risks associated with major airborne carcinogens, the SCAQMD conducted the Multiple Air Toxics Exposure Study (MATES) studies. According to the SCAQMD's MATES-IV study, the project site has an estimated cancer risk of 422 per million persons chance of cancer. In comparison, the average cancer risk for the Air Basin is 991 per million persons, which is based on the use of age-sensitivity factors detailed in the OEHHA Guidelines (OEHHA, 2015).

In order to provide a perspective of risk, it is often estimated that the incidence in cancer over a lifetime for the U.S. population ranges between 1 in 3 to 4 and 1 in 3, or a risk of about 300,000 per million persons. The MATES-III study referenced a Harvard Report on Cancer Prevention, which estimated that of cancers associated with known risk factors, about 30 percent were related to tobacco, about 30 percent were related to diet and obesity, and about 2 percent were associated with environmental pollution related exposures that includes hazardous air pollutants.

5.0 MODELING PARAMETERS AND ASSUMPTIONS

5.1 CalEEMod Model Input Parameters

The criteria air pollution and GHG emissions impacts created by the proposed project have been analyzed through use of CalEEMod Version 2016.3.2. CalEEMod is a computer model published by the SCAQMD for estimating air pollutant emissions. The CalEEMod program uses the EMFAC2014 computer program to calculate the emission rates specific for South Coast Air Basin portion of Riverside County for employee, vendor and haul truck vehicle trips and the OFFROAD2011 computer program to calculate emission rates for heavy equipment operations. EMFAC2014 and OFFROAD2011 are computer programs generated by CARB that calculates composite emission rates for vehicles. Emission rates are reported by the program in grams per trip and grams per mile or grams per running hour.

The project characteristics in the CalEEMod were set to a project location of the South Coast Air Basin portion of Riverside County, a Climate Zone of 10, and utility company of Southern California Edison, and an opening year of 2020 was utilized in this analysis.

Land Use Parameters

The proposed project would consist of the development of an 18-vehicle fueling position gas station with two canopies that total 6,092 square feet, an 8,360 square foot convenience store (C-store), and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include multiple parking lots that have a total of 78 parking spaces. A summary of the proposed project's land use parameters entered into the CalEEMod model is shown in Table F.

Table F – CalEEMod Land Use Parameters

Proposed Land Use	Land Use Subtype in CalEEMod	Land Use Size[1]	Lot Acreage[2]	Building/Paving[3] (square feet)
Gas Station and C-Store	Gasoline/Service Station	18 VFP	0.60	14,452
Fast Food Drive Thru	Fast Food Restaurant with Drive Thru	2.543 TSF	0.24	2,543
Parking Lot	Parking Lot	78 PS	2.00	31,200

Notes:
[1] VFP = Vehicle Fueling Position, TSF = Thousand Square Foot, PS = Parking Space
[2] Lot acreage calculated based on a total lot acreage of 2.84 acres.
[3] Building/Paving square feet represent area where architectural coatings will be applied.

Construction Parameters

Construction activities are anticipated to start around Spring 2019 and take approximately a year to complete. The construction-related GHG emissions were based on a 30-year amortization rate as recommended in the SCAQMD GHG Working Group meeting on November 19, 2009. The phases of construction activities that have been analyzed are detailed below and include: 1) site preparation, 2) grading, 3) building construction, 4) paving, and 5) application of architectural coatings.

Site Preparation

The site preparation phase would consist of removing any vegetation, tree stumps, and stones onsite prior to grading. The site preparation phase is anticipated to start in Spring 2019 and was modeled as occurring over one week. The site preparation activities would require 8 worker trips per day. In order to account for water truck emissions, six vendor truck emissions were added to the site preparation phase. The onsite equipment would consist of one grader, one scraper, and either one tractor, loader, or backhoe, which is based on the CalEEMod default equipment mix. The mitigation of water all exposed areas three

times per day was chosen in order to account for the fugitive dust reduction that would occur through adhering to SCAQMD Rule 403, which requires that the Best Available Control Measures be utilized to reduce fugitive dust emissions.

Grading

The grading phase would occur after the completion of the site preparation phase and is anticipated to take approximately two weeks to complete. The proposed grading is balanced, which would result in no dirt being imported or exported from the project site. The onsite equipment would consist of one grader, one rubber tired dozer, and two tractors, loaders, or backhoes, which is based on the CalEEMod default equipment mix. The grading activities would require 10 worker trips per day. In order to account for water truck emissions, six daily vendor truck trips were added to the grading phase. The mitigation of water all exposed areas three times per day was chosen in order to account for the fugitive dust reduction that would occur through adhering to SCAQMD Rule 403, which requires that the Best Available Control Measures be utilized to reduce fugitive dust emissions.

Building Construction

The building construction would occur after the completion of the grading phase. The building construction phase was modeled based on occurring over approximately 10 months. The building construction would require up to 16 worker trips and 7 vendor trips per day. The onsite equipment would consist of the simultaneous operation of one crane, two forklifts, one generator set, three welders, and one tractor, loaders or backhoe, which is based on the CalEEMod default equipment mix.

Paving

The paving would occur after the completion of the building construction phase. The paving activities was modeled as occurring over two weeks and would require up to 15 worker trips per day. The onsite equipment would consist of the simultaneous operation of one cement and mortar mixer, one paver, one paving equipment, two rollers, and one tractor, loader, or backhoe, which is based on the CalEEMod default equipment mix.

Architectural Coating

The application of architectural coatings would occur after the completion of the paving phase. The architectural coating phase was modeled based on covering 25,493 square feet of nonresidential interior area, 8,498 feet of nonresidential exterior area, and 1,872 feet of parking area that includes striping of the parking lots and other architectural coatings in public areas. The architectural coating phase was modeled as occurring over two weeks and would require up to four worker trips per day. The onsite equipment would consist of one air compressor, which is based on the CalEEMod default equipment mix.

Operational Emissions Modeling

The operations-related criteria air pollutant emissions and GHG emissions created by the proposed project have been analyzed through use of the CalEEMod model. The proposed project was analyzed in the CalEEMod model based on the land use parameters provided above.

Mobile Sources

Mobile sources include emissions the additional vehicle miles generated from the proposed project. The vehicle trips associated with the proposed project have been analyzed through use of a trip rate of 496.12 daily trips per 1,000 square feet at the proposed fast food restaurant with a drive-thru window and a trip rate of 162.78 daily trips per vehicle fueling position at the proposed gas station and convenience store that were obtained from the *Traffic Impact Study Kassab Travel Center, City of Lake Elsinore* (Traffic

Impact Analysis), prepared by Dudek, August 2018. This resulted in the proposed fast food restaurant generating 1,260 trips per day and the proposed gas station and convenience store generating 2,930 trips per day, for a total of 4,190 trips generated by the proposed project per day.

The analysis accounted for the Riverside Transit Agency Collier FS Riverside Stop located at approximately 100 feet northeast of the project site on the corner of Collier Avenue and Riverside Drive. The analysis also accounted for Project Design Feature 1 that requires the installation of sidewalks along the project site boundary that is adjacent to Riverside Drive as well as internal sidewalks to connect to neighborhood activity centers along Collier Avenue and Project Design Feature 2 that requires the installation of a Class II bike lane along Riverside Drive. No other changes were made to the CalEEMod default mobile source parameters.

Area Sources

Area sources include emissions from consumer products, landscape equipment and architectural coatings. The area source emissions were based on the on-going use of the proposed project in the CalEEMod model. No changes were made to the default area source parameters in the CalEEMod model.

Energy Usage

Energy usage includes emissions from electricity and natural gas used onsite (excluding fireplaces). The energy usage was based on the ongoing use of the proposed project in the CalEEMod Model. No changes were made to the default energy usage parameters in the CalEEMod model.

The GHG analysis included implementation of Measure E-1.3 from the Climate Action Plan, which requires that all new construction exceed the 2008 Energy Efficiency Standards (Title 24 Standards) by 15 percent. It should be noted that the Title 24, Part 6 2016 Building Energy Efficiency Standards that became effective on January 1, 2017, result in an approximately 50 percent improvement to the year 2008 Title 24 building standards and the year 2016 Title 24 Part 6 standards are accounted for in the current CalEEMod model. In addition, the analysis included the CalEEMod mitigation of a 25 percent improvement in lighting efficiency in order to account for AB 1109 that requires a 25 percent reduction in energy usage for nonresidential lighting.

Solid Waste

Waste includes the GHG emissions associated with the processing of waste from the proposed project as well as the GHG emissions from the waste once it is interred into a landfill. The analysis was based on the default CalEEMod waste generation rates of 38.96 tons of solid waste per year from the proposed project.

The GHG analysis included implementation of Project Design Features 7 and 8. Project Design Feature 7 requires the project applicant to contract with a waste provider that provides recycling services that divert a minimum of 65 percent of solid waste generated from the proposed project. Project Design Feature 8 requires the building contractor to recycle a minimum of 65 percent of the nonhazardous construction debris generated from construction of the proposed project. Since some Statewide recycling measures are already in effect, mitigation of a 50 percent reduction in waste disposed was selected in the CalEEMod model.

Water and Wastewater

Water includes the water used for the interior of the building as well as for landscaping and is based on the GHG emissions associated with the energy used to transport and filter the water. The analysis was based on the default CalEEMod water usage rate of 1,010,050 gallons per year of indoor water usage and

195,740 gallons per year of outdoor water usage from the proposed project. No changes were made to the default water and wastewater parameters in the CalEEMod model.

The GHG analysis included implementation of Measure E-4.2, requires that new developments reduce indoor water consumption by 30 percent. Implementation of 2013 Title 24 Part 11 (CalGreen) standards, which are statewide regulations are anticipated to result in a 30 percent reduction in indoor water usage through requiring the use of low-flow faucets and toilets. In order to account for the CalGreen building standards, mitigation of Install low-flow faucets and toilets were selected in the CalEEMod model.

Vegetation

The GHG analysis included implementation of Measure E-1.1 from the Climate Action Plan, which requires that all new developments plant a minimum one 15 gallon nondeciduous umbrella form tree per 30 linear feet of boundary length. The exact implementation of Measure E-1.1 will be determined in the Landscape Plan, however since the Landscape Plan has not yet been completed, this analysis estimated the number of trees based on the project site boundary, which is approximately 1,400 linear feet and would result in the planting of 47 trees. Since the CalEEMod model provides the total metric tons anticipated to be sequestered over the trees lifetime, the CalEEMod results have been amortized over 30 years in order to obtain the anticipated annual GHG emissions reductions. In order to ensure compliance with this measure, Project Design Feature 5 has been incorporated into this analysis.

6.0 THRESHOLDS OF SIGNIFICANCE

6.1 Regional Air Quality

Many air quality impacts that derive from dispersed mobile sources, which are the dominate pollution generators in the Air Basin, often occurs hours later and miles away after photochemical processes have converted primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual project is generally very small and difficult to measure. Therefore, SCAQMD has developed significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. The SCAQMD CEQA Handbook states that any project in the Air Basin with daily emissions that exceed any of the identified significance thresholds should be considered as having an individually and cumulatively significant air quality impact. For the purposes to this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the SCAQMD significance thresholds identified in Table G.

Table G – SCAQMD Regional Criteria Pollutant Emission Thresholds of Significance

	Pollutant Emissions (pounds/day)						
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**	**Lead**
Construction	75	100	550	150	150	55	3
Operation	55	55	550	150	150	55	3

Source: http://www.aqmd.gov/ceqa/handbook/signthres.pdf

The regional criteria pollutants analysis for both construction and operation of the proposed project can be found below in Section 7.3.

6.2 Local Air Quality

Project-related construction air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin. In order to assess local air quality impacts the SCAQMD has developed Localized Significant Thresholds (LSTs) to assess the project-related air emissions in the project vicinity. SCAQMD has also provided *Final Localized Significance Threshold Methodology* (LST Methodology), July 2008, which details the methodology to analyze local air emission impacts. The LST Methodology found that the primary emissions of concern are NO_2, CO, PM10, and PM2.5.

The LST Methodology provides Look-Up Tables with different thresholds based on the location and size of the project site and distance to the nearest sensitive receptors. The project site is approximately 2.84-acres. In order to provide a conservative analysis, the 2-acre project shown in the Look Up Tables has been utilized in this analysis.

As detailed above in Section 4.3, the project site is located in Air Monitoring Area 25, which covers Lake Elsinore. For PM10 and PM2.5, which are based on a 24-hour standard, the nearest sensitive receptors are the single-family homes located as near as 1,700 feet (518 meters) to the west of the project site. In order to provide a conservative analysis, the 500 meter threshold shown in the Look Up Tables has been utilized for PM10 and PM2.5 in this analysis. For NOx, which is based on a 1-hour threshold and CO, which is based on an 8-hour threshold, the nearest sensitive receptors are the offsite workers located as near as 100 feet (30 meters) northwest of the project site. In order to provide a conservative analysis, the

25 meter threshold shown in the Look Up Tables has been utilized for NOx and CO in this analysis. Table H shows the LSTs for NOx, CO, PM10 and PM2.5 for both construction and operational activities.

Table H – SCAQMD Local Air Quality Thresholds of Significance

Activity	Allowable Emissions (pounds/day)[1]			
	NOx	CO	PM10	PM2.5
Construction	234	1,100	186	91
Operation	234	1,100	45	22

Notes:
[1] For NOx and CO the thresholds are based on the nearest offsite workers (100 feet or 30 meters), which utilized the 25 meter threshold. For PM10 and PM2.5 the thresholds are based on the nearest homes (1,700 feet or 518 meters), which utilized the 500 meter threshold.
Source: Calculated from SCAQMD's Mass Rate Look-up Tables for two acres in Air Monitoring Area 25, Lake Elsinore.

6.3 Toxic Air Contaminants

According to the SCAQMD CEQA Handbook, any project that has the potential to expose the public to toxic air contaminants in excess of the following thresholds would be considered to have a significant air quality impact:

- If the Maximum Incremental Cancer Risk is 10 in one million or greater; or
- Toxic air contaminants from the proposed project would result in a Hazard Index increase of 1 or greater.

In order to determine if the proposed project may have a significant impact related to toxic air contaminants (TACs), the *Health Risk Assessment Guidance for analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*, (Diesel Analysis) prepared by SCAQMD, August 2003, recommends that if the proposed project is anticipated to create TACs through stationary sources or regular operations of diesel trucks on the project site, then the proximity of the nearest receptors to the source of the TAC and the toxicity of the hazardous air pollutant (HAP) should be analyzed through a comprehensive facility-wide health risk assessment (HRA).

6.4 Odor Impacts

The SCAQMD CEQA Handbook states that an odor impact would occur if the proposed project creates an odor nuisance pursuant to SCAQMD Rule 402, which states:

> "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
>
> The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals."

If the proposed project results in a violation of Rule 402 with regards to odor impacts, then the proposed project would create a significant odor impact.

6.5 Greenhouse Gases

The City of Lake Elsinore has adopted the *City of Lake Elsinore Climate Action Plan* (CAP), on December 13, 2011, that includes a GHG emissions reduction target based on a community-wide

emissions reduction to 6.6 $MTCO_2e$ per service population per year by 2020 and 4.4 $MTCO_2e$ per year by 2030. These efficiency-based targets were derived by dividing the statewide AB 32 targeted emissions levels for 2020 and statewide Executive Order S-3-05 targeted emissions level for 2030. These targets represent the maximum quantity emissions each person in the State of California could emit in 2020 and 2030 based on emissions levels necessary to achieve the statewide AB 32 and Executive Order S-3-05 GHG emissions reduction goals.

It should be noted that the CAP was prepared prior to the issuance of Executive Order B-30-15 on April 29, 2015 that provided a reduction goal of 40 percent below 1990 levels by 2030. This target was codified into statute through passage of AB 197 and SB 32 in September 2016. The *Staff Report Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets,* prepared by CARB June 2017, provides recommendations the MPOs located within the State to meet the new SB 32 targets. For SCAG, which is the MPO that represents Southern California, including the project site, this Report recommends that SCAG increase its year 2035 efficiency target from an 18 percent reduction to a 21 percent reduction in order to account for AB 197 and SB 32. This equates to a 16.7 percent increase in SCAG reduction target for the year 2035. In order to provide a conservative analysis, they year 2030 efficiency target of 4.4 $MTCO_2e$ was reduced by 16.7 percent to account for AB 197 and SB 32, which results in a modified efficiency target of 3.7 $MTCO_2e$ for the year 2030.

Therefore, the proposed project would be considered to create a significant cumulative GHG emissions impact if the proposed project's GHG emissions exceeds the service population efficiency targets of 6.6 $MTCO_2e$ per year for year 2020 and 3.7 $MTCO_2e$ per year for year 2030.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality and global climate change would occur if the proposed project is determined to result in:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people.
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

7.2 Air Quality Compliance

The proposed project would not conflict with or obstruct implementation of the SCAQMD Air Quality Management Plan (AQMP). The following section discusses the proposed project's consistency with the SCAQMD AQMP.

SCAQMD Air Quality Management Plan

The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and regional plans (CEQA Guidelines Section 15125). The regional plan that applies to the proposed project includes the SCAQMD AQMP. Therefore, this section discusses any potential inconsistencies of the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards. If the decision-makers determine that the proposed project is inconsistent, the lead agency may consider project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

(2) Whether the project will exceed the assumptions in the AQMP or increments based on the year of project buildout and phase.

Both of these criteria are evaluated in the following sections.

Criterion 1 - Increase in the Frequency or Severity of Violations?

Based on the air quality modeling analysis contained in this report, short-term regional construction air emissions would not result in significant impacts based on SCAQMD regional thresholds of significance discussed above in Section 6.1 or local thresholds of significance discussed above in Section 6.2. The ongoing operation of the proposed project would generate air pollutant emissions that are inconsequential on a regional basis and would not result in significant impacts based on SCAQMD thresholds of significance discussed above in Section 6.1. The analysis for long-term local air quality impacts showed that local pollutant concentrations would not be projected to exceed the air quality standards. Therefore, a less than significant long-term impact would occur and no mitigation would be required.

Therefore, based on the information provided above, the proposed project would be consistent with the first criterion.

Criterion 2 - Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with the assumptions in the AQMP. The emphasis of this criterion is to insure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The AQMP is developed through use of the planning forecasts provided in the RTP/SCS and FTIP. The RTP/SCS is a major planning document for the regional transportation and land use network within Southern California. The RTP/SCS is a long-range plan that is required by federal and state requirements placed on SCAG and is updated every four years. The FTIP provides long-range planning for future transportation improvement projects that are constructed with state and/or federal funds within Southern California. Local governments are required to use these plans as the basis of their plans for the purpose of consistency with applicable regional plans under CEQA. For this project, the City of Lake Elsinore Business District, adopted December 13, 2011, defines the assumptions that are represented in AQMP.

The project site is designated as Limited Industrial in the Business District Plan and is zoned Commercial Manufacturing (CM). The proposed project is consistent with the current land use designation and would not require a General Plan Amendment or zone change. As such, the proposed project is not anticipated to exceed the AQMP assumptions for the project site and is found to be consistent with the AQMP for the second criterion.

Based on the above, the proposed project will not result in an inconsistency with the SCAQMD AQMP. Therefore, a less than significant impact will occur in relation to implementation of the AQMP.

Level of Significance

Less than significant impact.

7.3 Air Quality Standard Violation

The proposed project would not violate an air quality standard or contribute substantially to an existing or projected air quality violation. The following section calculates the potential air emissions associated with the construction and operations of the proposed project and compares the emissions to the SCAQMD standards.

Construction Emissions

The proposed project would consist of the development of an 18-vehicle fueling position gas station with two canopies that total 5,264 square feet, a 8,360 square foot convenience store (C-store), and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include a 65-space parking lot. The construction emissions have been analyzed for both regional and local air quality impacts.

Construction-Related Regional Impacts

The CalEEMod model has been utilized to calculate the construction-related regional emissions from the proposed project and the input parameters utilized in this analysis have been detailed in Section 5.1. The worst-case summer or winter daily construction-related criteria pollutant emissions from the proposed project for each phase of construction activities are shown below in Table I and the CalEEMod daily printouts are shown in Appendix A. Since it is possible that building construction, paving, and architectural coating activities may occur concurrently, Table I also shows the combined criteria pollutant emissions from building construction, paving and architectural coating phases of construction.

Table I – Construction-Related Regional Criteria Pollutant Emissions

	Pollutant Emissions (pounds/day)					
Activity	**VOC**	**NOx**	**CO**	**SO_2**	**PM10**	**PM2.5**
Site Preparation[1]						
Onsite	1.76	21.54	11.91	0.02	1.47	0.85
Offsite	0.06	0.71	0.48	0.00	0.13	0.04
Total	**1.82**	**22.25**	**12.39**	**0.02**	**1.60**	**0.89**
Grading[1]						
Onsite	2.03	22.74	10.15	0.02	3.63	2.30
Offsite	0.08	0.72	0.57	0.00	0.16	0.05
Total	**2.11**	**23.46**	**10.72**	**0.02**	**3.79**	**2.35**
Building Construction						
Onsite	2.56	18.91	15.25	0.03	1.09	1.04
Offsite	0.13	0.98	1.01	0.00	0.27	0.08
Total	**2.69**	**19.89**	**16.26**	**0.03**	**1.36**	**1.12**
Paving						
Onsite	1.68	11.59	11.81	0.02	0.66	0.61
Offsite	0.08	0.05	0.60	0.00	0.17	0.05
Total	**1.76**	**11.64**	**12.41**	**0.02**	**0.83**	**0.66**
Architectural Coatings						
Onsite	16.86	1.68	1.83	0.00	0.11	0.11
Offsite	0.02	0.01	0.16	0.00	0.05	0.01
Total	**16.88**	**1.69**	**1.99**	**0.00**	**0.16**	**0.12**
Combined Building Construction, Paving, and Architectural Coatings	**21.33**	**33.22**	**30.66**	**0.05**	**2.35**	**1.90**
SCQAMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	No	No	No	No	No	No

Notes:
[1] Site Preparation and Grading based on adherence to fugitive dust suppression requirements from SCAQMD Rule 403.
[2] Onsite emissions from equipment not operated on public roads.
[3] Offsite emissions from vehicles operating on public roads.
Source: CalEEMod Version 2016.3.2.

Table I shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds during site preparation, grading, or the combined building construction, paving, and architectural coatings phases. Therefore, a less than significant regional air quality impact would occur from construction of the proposed project.

Construction-Related Local Impacts

Construction-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin.

The local air quality emissions from construction were analyzed through utilizing the methodology described in *Localized Significance Threshold Methodology* (LST Methodology), prepared by SCAQMD, revised October 2009. The LST Methodology found the primary criteria pollutant emissions of concern are NOx, CO, PM10, and PM2.5. In order to determine if any of these pollutants require a detailed analysis of the local air quality impacts, each phase of construction was screened using the SCAQMD's Mass Rate LST Look-up Tables. The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily onsite emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. Table J shows the onsite emissions from the CalEEMod model for the different construction phases and the calculated emissions thresholds that have been detailed above in Section 6.2. Since it is possible that building construction, paving, and architectural coating activities may occur concurrently, Table J also shows the combined local criteria pollutant emissions from building construction, paving and architectural coating phases of construction.

Table J – Construction-Related Local Criteria Pollutant Emissions

Phase	Pollutant Emissions (pounds/day)			
	NOx	**CO**	**PM10**	**PM2.5**
Site Preparation[1]	21.54	11.91	1.47	0.85
Grading[1]	22.74	10.15	3.63	2.30
Combined Building Construction, Paving, and Architectural Coatings	32.18	28.89	1.86	1.76
- *Building Construction*	*18.91*	*15.25*	*1.09*	*1.04*
- *Paving*	*11.59*	*11.81*	*0.66*	*0.61*
- *Architectural Coatings*	*1.68*	*1.83*	*0.11*	*0.11*
SCAQMD Localized Thresholds[2]	**234**	**1,100**	**186**	**91**
Exceeds Threshold?	No	No	No	No

Notes:
[1] Site Preparation and Grading based on adherence to fugitive dust suppression requirements from SCAQMD Rule 403.
[2] For NOx and CO the thresholds are based on the nearest offsite workers (100 feet or 30 meters), which utilized the 25 meter threshold. For PM10 and PM2.5 the thresholds are based on the nearest homes (1,700 feet or 518 meters), which utilized the 500 meter threshold.
Source: Calculated from CalEEMod and SCAQMD's Mass Rate Look-up Tables for two acres in Air Monitoring Area 25, Lake Elsinore.

The data provided in Table J shows that none of the analyzed criteria pollutants would exceed the local emissions thresholds during the site preparation or grading phase or the combined building construction, paving, and architectural coatings phases. Therefore, a less than significant local air quality impact would occur from construction of the proposed project.

Operational Emissions

The on-going operation of the proposed project would result in a long-term increase in air quality emissions. This increase would be due to emissions from the project-generated vehicle trips and through operational emissions from the on-going use of the proposed project. The following section provides an

analysis of potential long-term air quality impacts due to regional air quality and local air quality impacts from the on-going operations of the proposed project.

Operations-Related Regional Air Quality Impacts

The operations-related regional air quality impacts created by the proposed project have been analyzed through use of the CalEEMod model and the input parameters utilized in this analysis have been detailed in Section 5.2. The worst-case summer or winter VOC, NOx, CO, SO_2, PM10, and PM2.5 daily emissions created from the proposed project's long-term operations have been calculated and are summarized below in Table K and the CalEEMod daily emissions printouts are shown in Appendix A.

Table K – Operational Regional Criteria Pollutant Emissions

	Pollutant Emissions (pounds/day)					
Activity	**VOC**	**NOx**	**CO**	**SO_2**	**PM10**	**PM2.5**
Area Sources[1]	0.39	0.00	0.01	0.00	0.00	0.00
Energy Usage[2]	0.03	0.31	0.26	0.00	0.02	0.02
Mobile Sources[3]	7.93	48.57	45.88	0.16	8.44	2.35
Total Emissions	**8.35**	**48.88**	**46.15**	**0.16**	**8.46**	**2.37**
SCQAMD Operational Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold?	No	No	No	No	No	No

Notes:
[1] Area sources consist of emissions from consumer products, architectural coatings, and landscaping equipment.
[2] Energy usage consist of emissions from natural gas usage (excluding hearths).
[3] Mobile sources consist of emissions from vehicles and road dust.
Source: Calculated from CalEEMod Version 2016.3.2.

The data provided in Table K above shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds. Therefore, a less than significant regional air quality impact would occur from operation of the proposed project.

Operations-Related Local Air Quality Impacts

Project-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin. The proposed project has been analyzed for the potential local CO emission impacts from the project-generated vehicular trips and from the potential local air quality impacts from on-site operations. The following analysis analyzes the vehicular CO emissions and local impacts from on-site operations.

Local CO Hotspot Impacts from Project-Generated Vehicular Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential local air quality impacts. Local air quality impacts can be assessed by comparing future without and with project CO levels to the State and Federal CO standards of 20 ppm over one hour or 9 ppm over eight hours.

At the time of the 1993 Handbook, the Air Basin was designated nonattainment under the CAAQS and NAAQS for CO. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the Air Basin and in the state have steadily declined. In 2007, the Air Basin was designated in attainment for CO under both the CAAQS and NAAQS. SCAQMD conducted a CO hot spot analysis for attainment at the busiest intersections in Los

Angeles during the peak morning and afternoon periods and did not predict a violation of CO standards[1]. Since the nearby intersections to the proposed project are much smaller with less traffic than what was analyzed by the SCAQMD, no local CO Hotspot are anticipated to be created from the proposed project and no CO Hotspot modeling was performed. Therefore, a less than significant long-term air quality impact is anticipated to local air quality with the on-going use of the proposed project.

Local Criteria Pollutant Impacts from Onsite Operations

Project-related air emissions from onsite sources such as architectural coatings, landscaping equipment, and onsite usage of natural gas appliances may have the potential to create emissions areas that exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin.

The local air quality emissions from on-site operations were analyzed using the SCAQMD's Mass Rate LST Look-up Tables and the methodology described in LST Methodology. The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. Table L shows the onsite emissions from the CalEEMod model that includes area sources, energy usage, vehicles, and off-road equipment operating onsite and the calculated emissions thresholds.

Table L – Operations-Related Local Criteria Pollutant Emissions

	Pollutant Emissions (pounds/day)			
On-Site Emission Source	**NOx**	**CO**	**PM10**	**PM2.5**
Area Sources	0.00	0.00	0.00	0.00
Energy Usage	0.31	0.26	0.02	0.02
Onsite Vehicle Emissions[1]	6.07	5.74	1.06	0.29
Total Emissions	**6.38**	**6.01**	**1.08**	**0.31**
SCAQMD Localized Thresholds[2]	**234**	**1,100**	**45**	**22**
Exceeds Threshold?	No	No	No	No

Notes:
[1] Onsite vehicle emissions based on 1/8 of the gross vehicular emissions, which is the estimated portion of vehicle emissions occurring within a quarter mile of the project site.
[2] For NOx and CO the thresholds are based on the nearest offsite workers (100 feet or 30 meters), which utilized the 25 meter threshold. For PM10 and PM2.5 the thresholds are based on the nearest homes (1,700 feet or 518 meters), which utilized the 500 meter threshold.
Source: Calculated from CalEEMod and SCAQMD's Mass Rate Look-up Tables for two acres in Air Monitoring Area 25, Lake Elsinore.

The data provided in Table L shows that the on-going operations of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 6.2. Therefore, the on-going operations of the proposed project would create a less than significant operations-related impact to local air quality due to on-site emissions and no mitigation would be required.

Level of Significance

Less than significant impact.

[1] The four intersections analyzed by the SCAQMD were: Long Beach Boulevard and Imperial Highway; Wilshire Boulevard and Veteran Avenue; Sunset Boulevard and Highland Avenue; and La Cienega Boulevard and Century Boulevard. The busiest intersection evaluated (Wilshire and Veteran) had a daily traffic volume of approximately 100,000 vehicles per day with LOS E in the morning and LOS F in the evening peak hour.

7.4 Cumulative Net Increase in Non-Attainment Pollution

The proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources, which travel throughout the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered would cover an even larger area. Accordingly, the cumulative analysis for the project's air quality must be generic by nature. The project area is out of attainment for ozone and PM10 and PM2.5 particulate matter. In accordance with CEQA Guidelines Section 15130(b), this analysis of cumulative impacts incorporates a three-tiered approach to assess cumulative air quality impacts.

- Consistency with the SCAQMD project specific thresholds for construction and operations;
- Project consistency with existing air quality plans; and
- Assessment of the cumulative health effects of the pollutants.

Consistency with Project Specific Thresholds

Construction-Related Impacts

The project site is located in the South Coast Air Basin, which is currently designated by the EPA for federal standards as a non-attainment area for ozone and PM2.5 and by CARB for the state standards as a non-attainment area for ozone, PM10, and PM2.5. The regional ozone, PM10, and PM2.5 emissions associated with construction of the proposed project have been calculated above in Section 7.3. The above analysis found that development of the proposed project would result in less than significant regional emissions of VOC and NOx (ozone precursors), PM10, and PM2.5 during construction of the proposed project. Therefore, a less than significant cumulative impact would occur from construction of the proposed project.

Operational-Related Impacts

The greatest cumulative operational impact on the air quality to the Air Basin will be the incremental addition of pollutants mainly from increased traffic from residential, commercial, and industrial development. In accordance with SCAQMD methodology, projects that do not exceed SCAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact. The regional ozone, PM10, and PM2.5 emissions created from the on-going operations of the proposed project have been calculated above in Section 7.3. The above analysis found that development of the proposed project would result in less than significant regional emissions of VOC and NOx (ozone precursors), PM10, and PM2.5 during operation of the proposed project. With respect to long-term emissions, this project would create a less than significant cumulative impact.

Consistency with Air Quality Plans

As detailed above in Section 7.2, the project site is currently designated as Limited Industrial in the Business District Plan and is zoned Commercial Manufacturing (CM). The proposed project is consistent with the current land use designation and would not require a General Plan Amendment or zone change. Therefore, the proposed project would not result in an inconsistency with the current land use designation. As such, the proposed project is not anticipated to exceed the AQMP assumptions for the project site and is found to be consistent with the AQMPs for the Air Basin.

Cumulative Health Impacts

The Air Basin is designated as nonattainment for ozone, PM10, and PM2.5, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect public health, including the health of sensitive individuals (elderly, children, and the sick). Therefore, when the concentrations of those pollutants exceeds the standard, it is likely that some sensitive individuals in the population would experience health effects. The regional analysis detailed above in Section 7.3 found that the proposed project would not exceed the SCAQMD regional significance thresholds for VOC and NOx (ozone precursors), PM10 and PM2.5. As such, the proposed project would result in a less than significant cumulative health impact.

Level of Significance

Less than significant impact.

7.5 Sensitive Receptors

The proposed project would not expose sensitive receptors to substantial pollutant concentrations. The local concentrations of criteria pollutant emissions produced in the nearby vicinity of the proposed project, which may expose sensitive receptors to substantial concentrations have been calculated above in Section 7.3 for both construction and operations, which are discussed separately below. The discussion below also includes an analysis of the potential impacts from toxic air contaminant emissions. The nearest sensitive receptors are the offsite workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet southwest of the project site

Construction-Related Sensitive Receptor Impacts

Construction of the proposed project may expose sensitive receptors to substantial pollutant concentrations of localized criteria pollutant concentrations and from toxic air contaminant emissions created from onsite construction equipment, which are described below.

Local Criteria Pollutant Impacts from Construction

The local air quality impacts from construction of the proposed project has been analyzed above in Section 7.3 and found that the construction of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 6.2. Therefore, construction of the proposed project would create a less than significant construction-related impact to local air quality and no mitigation would be required.

Toxic Air Contaminants Impacts from Construction

The greatest potential for toxic air contaminant emissions would be related to diesel particulate matter (DPM) emissions associated with heavy equipment operations during construction of the proposed project. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. Given the relatively limited number of heavy-duty construction equipment and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 70 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. In addition, California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449 regulates emissions from off-road diesel equipment in California. This regulation limits idling of equipment to no more than five minutes, requires equipment operators to label each piece of equipment and provide annual reports to CARB of their fleet's usage and emissions. This regulation also

requires systematic upgrading of the emission Tier level of each fleet, and currently no commercial operator is allowed to purchase Tier 0 or Tier 1 equipment and by January 2023 no commercial operator is allowed to purchase Tier 2 equipment. In addition to the purchase restrictions, equipment operators need to meet fleet average emissions targets that become more stringent each year between years 2014 and 2023. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project. As such, construction of the proposed project would result in a less than significant exposure of sensitive receptors to substantial pollutant concentrations.

Operations-Related Sensitive Receptor Impacts

The on-going operations of the proposed project may expose sensitive receptors to substantial pollutant concentrations of local CO emission impacts from the project-generated vehicular trips and from the potential local air quality impacts from onsite operations. The following analyzes the vehicular CO emissions. Local criteria pollutant impacts from onsite operations, and toxic air contaminant impacts.

Local CO Hotspot Impacts from Project-Generated Vehicle Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential impacts to sensitive receptors. The analysis provided above in Section 7.3 shows that no local CO Hotspots are anticipated to be created at any nearby intersections from the vehicle traffic generated by the proposed project. Therefore, operation of the proposed project would result in a less than significant exposure of offsite sensitive receptors to substantial pollutant concentrations.

Local Criteria Pollutant Impacts from Onsite Operations

The local air quality impacts from the operation of the proposed project would occur from onsite sources such as architectural coatings, landscaping equipment, and onsite usage of natural gas appliances. The analysis provided above in Section 7.3 found that the operation of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 6.2. Therefore, the on-going operations of the proposed project would create a less than significant operations-related impact to local air quality due to on-site emissions and no mitigation would be required.

Operations-Related Toxic Air Contaminant Impacts

The proposed project would include an 18-fueling position gas and diesel station that has been estimated to have a throughput of 2 million gallons of gasoline per year. The *Emission Inventory and Risk Assessment Guidelines for Gasoline Dispensing Stations* (Gas Station Risk Assessment), prepared by SCAQMD, January 2007, analyzed the TAC emissions and associated cancer risks from gasoline dispensing facilities at locations throughout the Air Basin. It should be noted that the proposed project would also sell diesel fuel, however the Gas Station Risk Assessment did not find diesel fueling activities as a source of substantial TAC emissions and therefore this analysis has been limited to the analysis of TAC emissions created from gasoline dispensing stations.

The Gas Station Risk Assessment provides residential cancer risk Look Up Tables that are based on the wind patterns from representative monitoring stations throughout Southern California. The Norco Monitoring Station data from the Look Up Tables was utilized as that is the nearest location to the project site. Based on a worst-case analysis of the nearest homes being located as near as 500 meters (1,640 feet) downwind from the gas fuel dispensers, the Look Up Tables show that a one million gallon per year gas throughput gas station would create a residential cancer risk of 0.02 per million persons. Based on the formula provided in the Gas Station Risk Assessment, the proposed project with a throughput of 2 million gallons per year would create a **cancer risk of 0.04 per million persons**. The project-related cancer risk

of 0.04 per million persons would be within the SCAQMD's threshold of 10 per million detailed above in Section 6.3. As such, the TAC emissions and associated cancer risks from the proposed gas station would result in a less than significant impact to the nearby residents.

Therefore, operation of the proposed project would result in a less than significant exposure of sensitive receptors to substantial pollutant concentrations.

Level of Significance

Less than significant impact.

7.6 Objectionable Odors

The proposed project would not create objectionable odors affecting a substantial number of people. Potential odor impacts have been analyzed separately for construction and operations below.

Individual responses to odors are highly variable and can result in a variety of effects. Generally, the impact of an odor results from a variety of factors such as frequency, duration, offensiveness, location, and sensory perception. The frequency is a measure of how often an individual is exposed to an odor in the ambient environment. The intensity refers to an individual's or group's perception of the odor strength or concentration. The duration of an odor refers to the elapsed time over which an odor is experienced. The offensiveness of the odor is the subjective rating of the pleasantness or unpleasantness of an odor. The location accounts for the type of area in which a potentially affected person lives, works, or visits; the type of activity in which he or she is engaged; and the sensitivity of the impacted receptor.

Sensory perception has four major components: detectability, intensity, character, and hedonic tone. The detection (or threshold) of an odor is based on a panel of responses to the odor. There are two types of thresholds: the odor detection threshold and the recognition threshold. The detection threshold is the lowest concentration of an odor that will elicit a response in a percentage of the people that live and work in the immediate vicinity of the project site and is typically presented as the mean (or 50 percent of the population). The recognition threshold is the minimum concentration that is recognized as having a characteristic odor quality, this is typically represented by recognition by 50 percent of the population. The intensity refers to the perceived strength of the odor. The odor character is what the substance smells like. The hedonic tone is a judgment of the pleasantness or unpleasantness of the odor. The hedonic tone varies in subjective experience, frequency, odor character, odor intensity, and duration.

Construction-Related Odor Impacts

Potential sources that may emit odors during construction activities include the application of coatings such as asphalt pavement, paints and solvents and from emissions from diesel equipment. The objectionable odors that may be produced during the construction process would be temporary and would not likely be noticeable for extended periods of time beyond the project site's boundaries. Due to the transitory nature of construction odors, a less than significant odor impact would occur and no mitigation would be required.

Potential Operations-Related Odor Impacts

The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast-food restaurant with a drive-thru window, and a parking lot. Potential sources that may emit odors during the on-going operations of the proposed project would primarily occur from odor emissions from gas dispensing activities and from the trash storage areas. Pursuant to SCAQMD Rule 461 the proposed gas station will be required to utilize gas dispensing equipment that minimizes vapor and liquid leaks and requires that the equipment be maintained at proper working order, which will

minimize odor impacts occurring from the gasoline and diesel dispensing facilities. Pursuant to City regulations, permanent trash enclosures that protect trash bins from rain as well as limit air circulation would be required for the trash storage areas. Due to the distance of the nearest receptors from the project site and through compliance with SCAQMD's Rule 461 and City trash storage regulations, no significant impact related to odors would occur during the on-going operations of the proposed project. Therefore, a less than significant odor impact would occur and no mitigation would be required.

Level of Significance

Less than significant impact.

7.7 Generation of Greenhouse Gas Emissions

The proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast-food restaurant with a drive-thru window, and a parking lot. The City of Lake Elsinore has adopted the *City of Lake Elsinore Climate Action Plan* (Climate Action Plan), on December 13, 2011, which provides service population efficiency targets of 6.6 $MTCO_2e$ per year for year 2020 and 4.4 $MTCO_2e$ per year for 2030.

In order to determine if the proposed project meets the efficiency targets set forth in the Climate Action Plan, the GHG emissions from the proposed project were analyzed for year 2020 conditions. A summary of the results is shown below in Table M and the CalEEMod model run for year 2020 is provided in Appendix B.

Table M – Proposed Project Greenhouse Gas Annual Emissions

	Greenhouse Gas Emissions (Metric Tons per Year)			
Category	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Area Sources[1]	0.00	0.00	0.00	0.00
Energy Usage[2]	132.50	0.00	0.00	133.11
Mobile Sources[3]	2,057.31	0.23	0.00	2,062.96
Solid Waste[4]	3.95	0.23	0.00	9.80
Water and Wastewater[5]	4.46	0.03	0.00	5.36
Construction[6]	8.93	0.00	0.00	8.97
Vegetation[7]				-1.11
Total GHG Emissions	**2,207.15**	**0.49**	**0.00**	**2,219.09**
SCAQMD Draft Threshold of Significance for All Land Uses				**3,000**
Service Population[8]				**2,095**
Year 2020 Emissions per Service Population				**1.1**
City of Lake Elsinore CAP Year 2020 Efficiency Target				**6.6**
City of Lake Elsinore CAP Modified Year 2030 Efficiency Target[9]				**3.7**

Notes:
[1] Area sources consist of GHG emissions from consumer products, architectural coatings, and landscaping equipment.
[2] Energy usage consists of GHG emissions from electricity and natural gas usage.
[3] Mobile sources consist of GHG emissions from vehicles.
[4] Waste includes the CO_2 and CH_4 emissions created from the solid waste placed in landfills.
[5] Water includes GHG emissions from electricity used for transport of water and processing of wastewater.
[6] Construction emissions amortized over 30 years as recommended in the SCAQMD GHG Working Group on November 19, 2009.
[7] Vegetation sequestration amortized over 30 years.
[8] Service population based on the total daily trips to the project site (Dudek, 2018) and then divided by two, since each customer and employee would make one trip to the project site and one trip leaving the project site.
[9] The CAP's Year 2030 Efficiency Target of 4.4 $MTCO_2e$ per year was reduced by 16.7 percent to account for AB 197 and SB 32.
Source: CalEEMod Version 2016.3.2.

Table M above shows that for the year 2020, the proposed project would create 1,219.09 $MTCO_2e$ per year, which is within the SCAQMD's draft threshold of significance for all land use types of 3,000 $MTCO_2e$ per year. Table M also shows that the project GHG emissions would result in an efficiency rate of 1.1 $MTCO_2e$ per year per service population. The GHG emissions from the proposed project would be within the CAP's Year 2020 Efficiency Target of 6.6 $MTCO_2e$ per year and within the modified CAP's 2030 Efficiency Target of 3.74 $MTCO_2e$ per year that has been modified to account for the more stringent GHG emissions reductions required by AB 197 and SB 32. It should be noted that the Year 2020 emissions are based on approved statewide GHG reduction measures and the required GHG reduction measures provided in the City's Climate Action Plan which are detailed below in Section 7.8 and include Project Design Features 1 through 8. Therefore, impacts would be less than significant.

Level of Significance

Less than significant impact.

7.8 Greenhouse Gas Plan Consistency

The proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions. The City of Lake Elsinore has adopted the *City of Lake Elsinore Climate Action Plan* (Climate Action Plan), on December 13, 2011. The Climate Action Plan provides specific measures to be implemented in new developments to reduce GHG emissions as well as a GHG emissions reduction target based on a community-wide emissions reduction to 6.6 $MTCO_2e$ per service population per year by 2020. Table N provides a list of the applicable reduction measures for new non-residential developments included in the Climate Action Plan. Table N also provides a project consistency analysis of each measure.

Table N – GHG Reduction Measures for New Developments and Project Consistency

Local Measure	Measure Description	Project Consistency
T-1.2: Pedestrian Infrastructure	Through the development review process, require the installation of sidewalks along new and reconstructed streets. Also require new subdivisions and large developments to provide sidewalks or paths to internally link all uses where applicable and provide connections to neighborhood activity centers, major destinations, and transit facilities contiguous with the project site; implement through conditions of approval.	**Consistent.** Project Design Feature 1 is provided that requires the installation of sidewalks along the project site boundary that is adjacent to Riverside drive and Collier Avenue as well as internal sidewalks to connect to neighborhood activity centers, major destinations, and transit facilities.
T-1.4: Bicycle Infrastructure	Through the development review process, require new development, as applicable, to implement and connect to the network of Class I, II and III bikeways, trails and safety features identified in the General Plan, Bike Lane Master Plan, Trials Master Plan and Western Riverside County Non-Motorized Transportation plan, implement through conditions of approval. The City will also continue to pursue and utilize funding when needed to implement portions of these plans.	**Consistent.** Project Design Feature 2 is provided which requires the installation of a bike lane along the project site boundary with Riverside Drive and Collier Avenue. See the Lake Elsinore General Plan Circulation Element, Figure 2.5 Bikeway Plan.
T-1.5: Bicycle Parking Standards	Through the development review process, enforce the following short-term and long-term bicycle parking standards for new non-residential development (consistent with 2010 California Green Building Code [CalGreen], Section 5.106.4), and implement through conditions of approval:	**Consistent.** Project Design Feature 3 is provided which requires the installation of bicycle parking spaces to equal five percent of the visitor parking capacity. The Site Plan for the project details the locations of the two bike racks, with one located east of the

Table N – GHG Reduction Measures for New Developments and Project Consistency

Local Measure	Measure Description	Project Consistency
	• *Short-Term Bicycle Parking:* If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitor entrance, readily visible to passers-by, for 5% of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack. • *Long-Term Bicycle Parking*: For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5% of tenant-occupied motorized vehicle parking capacity, with a minimum of one space.	Convenience Store entrance and the other located south of the Drive-Thru restaurant entrance.
T-3.1: Mixed Use, High Density, Infill and Transit Oriented Development	Revise the Land Use Map and Municipal Code to allow for and/or increase the amount of mixed use, high density, infill and transit oriented development. Mixed-use projects should be targeted in the Historic and Ballpark Districts, as well as other areas where services are within walking distance. High density projects should be located in urbanized areas adjacent to services and transportation. Update the Municipal Code for consistency between zoning regulations and General Plan land use designations.	**Consistent.** The proposed project will be developed on a street with commercial uses located within walking distance and the nearest bus stop is located as near as 80 feet northeast of the project site.
T-4.1: Commute Trip Reduction Program	Institute a commute trip reduction program for employers with fewer than 100 employees (below the requirements of the existing Transportation Demand Management Program). Provide information, training, and incentives to encourage participation.	**Consistent.** Project Design Feature 4 is provided that requires the applicant to install a board in the employee work area of the Convenience Store and Drive-Thru Restaurant that provides bus route maps and information about carpooling and bicycling to work.
E-1.1: Tree Planting Requirements	Require new development to plant at minimum one 15-gallon nondeciduous, umbrella-form tree per 30 linear feet of boundary length near buildings, per the Municipal Code. Trees shall be planted in strategic locations around buildings or to shade pavement in parking lots and streets.	**Consistent.** Project Design Feature 5 is provided that requires the applicant to prepare a landscape plan that meets the requirement to plant a minimum of one 15 gallon nondeciduous umbrella form tree per 30 linear feet of boundary length (minimum of 47 trees for the project site).
E-1.2 Cool Roof Requirements	Amend the City Municipal Code to require new non-residential development to use roofing materials having solar reflectance, thermal emittance or Solar Reflectance Index (SRI)3 consistent with CalGreen Tier 1 values (Table A5.106.11.2.1), and implement through conditions of approval.	**Consistent.** Project Design Feature 6 is provided that requires the applicant to use roofing material that has a Solar Reflective Index (SRI) of 75 or higher as detailed in Section 140.3 of the 2013 Title 24 Part 6 (CalGren) Building Standards.
E-1.3: Energy Efficient Building Standards	Adopt an ordinance requiring that all new construction exceed the California Energy Code requirements, based on the 2008 Energy Efficiency Standards by 15% (consistent with CalGreen Tier 1), through either the performance based on prescriptive approach described in the California Green Building Code; implement through	**Consistent.** The proposed project will be required to be designed to meet Title 24 Part 6 year 2016 Building Energy Efficiency standards that provide over 40% greater efficiency than the 2008 Energy Efficiency Standards.

Table N – GHG Reduction Measures for New Developments and Project Consistency

Local Measure	Measure Description	Project Consistency
	conditions of approval. Alternatively, a solar photovoltaic system and/or solar water heating may be used to assist in meeting all or a portion of the 15% requirement.	
E-4.1: Landscaping Ordinance	Enforce the City's Assembly Bill 1881 Landscaping Ordinance; implement through conditions of approval.	**Consistent.** Project Design Feature 5 is provided that requires the Landscape Plan to be designed to be consistent with the requirements of AB 1881.
E-4.2: Indoor Water Conservation Requirements	Amend the City's Uniform Building Code to require development projects to reduce indoor water consumption by 30% (consistent with CalGreen Tier 1, Section A5.303.2.3.1), and implement through conditions of approval.	**Consistent.** The proposed project will utilize water fixtures that are sold in California that are required to meet CCR Title 20, Sections 1601 – 1608 that require all water fixtures to be low flow and provide an average water use reduction of 30%.
S-1.1: Commercial Recycling	Renegotiate the contract with the waste provider to require curbside recycling for all commercial land uses to divert 65% of commercial solid waste by 2020 and 75% of commercial solid waste by 2030.	**Consistent.** Project Design Feature 7 is provided that requires the applicant to contract with a waste provider that provides recycling services and diverts a minimum of 65 percent of solid waste generated by the project.
S-1.4: Construction and Demolition Waste Diversion	Amend the Municipal Code to require development projects to divert, recycle or salvage at least 65% of nonhazardous construction and demolition debris generated at the site by 2020 (consistent with CalGreen Tier 1, Section A 5.408.3.1). Require all construction and demolition projects to be accompanied by a waste management plan for the project and a copy of the completed waste management report shall be provided upon completion.	**Consistent.** Project Design Feature 8 is provided that requires the building contractor for the proposed project to recycle a minimum of 65 percent of the nonhazardous construction debris and to prepare a waste management plan that details how this is achieved.

Source: City of Lake Elsinore Climate Action Plans, December 13, 2011.

As shown above in Table N, with implementation of Project Design Features 1 through 8, the proposed project is consistent with the applicable local measures provided in the Climate Action Plan. In addition, Section 7.7 found that the proposed project would comply with the City's year 2020 efficiency target of 6.6 $MTCO_2e$ per year and modified year 2030 efficiency target of 3.7 $MTCO_2e$ per year that has been modified to account for the more stringent GHG emissions reductions required by AB 197 and SB 32. Therefore, the proposed project would comply with the Climate Action Plan's local measures and reduction targets and would not conflict with the applicable plan for reducing GHG emissions. Impacts would be less than significant.

Level of Significance

Less than significant impact.

8.0 REFERENCES

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APPENDIX A

CalEEMod Model Daily Printouts

Kassab Travel Center

Riverside-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	78.00	Space	2.00	31,200.00	0
Fast Food Restaurant with Drive Thru	2.54	1000sqft	0.24	2,543.00	0
Gasoline/Service Station	18.00	Pump	0.60	14,452.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Opening Year 2020

Land Use - 18-Pump, 14,452 SF Gas Sttion on 0.6 AC; 2.543 SF Fast Food Restaurant with Drive-Thru on 0.24 AC; and 78-space Parking Lot on 2 AC.

Construction Phase - 5 days Site Prep; 10 days Grading; 220 days Building Construction; 10 days Paving; and 10 days Painting.

Trips and VMT - To account for water trucks, 6 vendor trips added to Site Prep and Grading phases.

Grading -

Vehicle Trips - Gas Service Station Trip Rate of 162.78 obtained from the Traffic Impact Analysis revised by Dudek, August 2018.

Energy Use -

Sequestration - Required to plant 47 new miscellaneous trees.

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected.

Mobile Land Use Mitigation - Increase transit to nearest busstop (0.02 miles from the project site) and provide sidewalks onsite and connecting offsite.

Energy Mitigation - Exceed Title 24 by 30% and improve lighting efficiency by 25%.

Water Mitigation - Install low-flow fixtures and water-efficient irrigation systems.

Waste Mitigation - 50% reduction in waste.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	2,540.00	2,543.00
tblLandUse	LandUseSquareFeet	2,541.15	14,452.00
tblLandUse	LotAcreage	0.70	2.00
tblLandUse	LotAcreage	0.06	0.24
tblLandUse	LotAcreage	0.06	0.60
tblSequestration	NumberOfNewTrees	0.00	47.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblVehicleTrips	WD_TR	168.56	162.78

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6893	23.4612	16.2692	0.0293	6.7025	1.0984	7.7814	3.4082	1.0528	4.4009	0.0000	2,750.1168	2,750.1168	0.7836	0.0000	2,762.7369
2020	16.8850	18.3139	15.8139	0.0292	0.2636	0.9542	1.2178	0.0711	0.9145	0.9856	0.0000	2,718.5034	2,718.5034	0.5459	0.0000	2,730.6643
Maximum	**16.8850**	**23.4612**	**16.2692**	**0.0293**	**6.7025**	**1.0984**	**7.7814**	**3.4082**	**1.0528**	**4.4009**	**0.0000**	**2,750.1168**	**2,750.1168**	**0.7836**	**0.0000**	**2,762.7369**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6893	23.4612	16.2692	0.0293	2.7056	1.0984	3.7845	1.3540	1.0528	2.3468	0.0000	2,750.1168	2,750.1168	0.7836	0.0000	2,762.7369
2020	16.8850	18.3139	15.8139	0.0292	0.2636	0.9542	1.2178	0.0711	0.9145	0.9856	0.0000	2,718.5034	2,718.5034	0.5459	0.0000	2,730.6643
Maximum	**16.8850**	**23.4612**	**16.2692**	**0.0293**	**2.7056**	**1.0984**	**3.7845**	**1.3540**	**1.0528**	**2.3468**	**0.0000**	**2,750.1168**	**2,750.1168**	**0.7836**	**0.0000**	**2,762.7369**

Kassab Travel Center - Riverside-South Coast County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	57.38	0.00	44.41	59.04	0.00	38.14	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037
Mobile	7.9267	48.5745	45.8825	0.1598	8.3021	0.1316	8.4337	2.2216	0.1238	2.3454		16,390.2894	16,390.2894	1.5273		16,428.4705
Total	**8.3551**	**48.8874**	**46.1555**	**0.1617**	**8.3021**	**0.1554**	**8.4575**	**2.2216**	**0.1476**	**2.3692**		**16,765.7834**	**16,765.7834**	**1.5345**	**6.8800e-003**	**16,806.1973**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
Mobile	7.8278	47.5717	42.8931	0.1475	7.3225	0.1202	7.4427	1.9594	0.1131	2.0725		15,142.2336	15,142.2336	1.4914		15,179.5177
Total	**8.2525**	**47.8509**	**43.1377**	**0.1492**	**7.3225**	**0.1415**	**7.4640**	**1.9594**	**0.1343**	**2.0938**		**15,477.1638**	**15,477.1638**	**1.4979**	**6.1400e-003**	**15,516.4396**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	1.23	2.12	6.54	7.73	11.80	8.95	11.75	11.80	9.00	11.63	0.00	7.69	7.69	2.39	10.76	7.67

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2019	3/7/2019	5	5	
2	Grading	Grading	3/8/2019	3/21/2019	5	10	
3	Building Construction	Building Construction	3/22/2019	1/23/2020	5	220	
4	Paving	Paving	1/24/2020	2/6/2020	5	10	
5	Architectural Coating	Architectural Coating	2/7/2020	2/20/2020	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5

Acres of Paving: 2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 25,493; Non-Residential Outdoor: 8,498; Striped Parking Area: 1,872 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	19.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854		2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**1.5908**	**0.8537**	**2.4445**	**0.1718**	**0.7854**	**0.9572**		**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0441	0.0270	0.3554	9.1000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		91.0018	91.0018	2.5500e-003		91.0655
Total	**0.0640**	**0.7100**	**0.4834**	**2.4900e-003**	**0.1278**	**5.7400e-003**	**0.1336**	**0.0348**	**5.4700e-003**	**0.0403**		**257.3834**	**257.3834**	**0.0159**		**257.7799**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6204	0.0000	0.6204	0.0670	0.0000	0.0670			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854	0.0000	2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**0.6204**	**0.8537**	**1.4741**	**0.0670**	**0.7854**	**0.8524**	**0.0000**	**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0441	0.0270	0.3554	9.1000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		91.0018	91.0018	2.5500e-003		91.0655
Total	**0.0640**	**0.7100**	**0.4834**	**2.4900e-003**	**0.1278**	**5.7400e-003**	**0.1336**	**0.0348**	**5.4700e-003**	**0.0403**		**257.3834**	**257.3834**	**0.0159**		**257.7799**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871		2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**6.5523**	**1.0730**	**7.6253**	**3.3675**	**0.9871**	**4.3546**		**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0551	0.0338	0.4443	1.1400e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		113.7522	113.7522	3.1800e-003		113.8319
Total	**0.0750**	**0.7168**	**0.5723**	**2.7200e-003**	**0.1502**	**5.8800e-003**	**0.1561**	**0.0407**	**5.6000e-003**	**0.0463**		**280.1338**	**280.1338**	**0.0165**		**280.5462**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5554	0.0000	2.5554	1.3133	0.0000	1.3133			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871	0.0000	2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**2.5554**	**1.0730**	**3.6284**	**1.3133**	**0.9871**	**2.3005**	**0.0000**	**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0200	0.6830	0.1280	1.5800e-003	0.0384	5.1900e-003	0.0436	0.0111	4.9600e-003	0.0160		166.3816	166.3816	0.0133		166.7144
Worker	0.0551	0.0338	0.4443	1.1400e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		113.7522	113.7522	3.1800e-003		113.8319
Total	**0.0750**	**0.7168**	**0.5723**	**2.7200e-003**	**0.1502**	**5.8800e-003**	**0.1561**	**0.0407**	**5.6000e-003**	**0.0463**		**280.1338**	**280.1338**	**0.0165**		**280.5462**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449		2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**		**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0267	0.9107	0.1707	2.1100e-003	0.0512	6.9200e-003	0.0582	0.0148	6.6200e-003	0.0214		221.8421	221.8421	0.0178		222.2859
Worker	0.1046	0.0642	0.8441	2.1700e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		216.1292	216.1292	6.0500e-003		216.2805
Total	**0.1313**	**0.9749**	**1.0147**	**4.2800e-003**	**0.2636**	**8.2300e-003**	**0.2718**	**0.0711**	**7.8300e-003**	**0.0789**		**437.9713**	**437.9713**	**0.0238**		**438.5664**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449	0.0000	2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**	**0.0000**	**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0267	0.9107	0.1707	2.1100e-003	0.0512	6.9200e-003	0.0582	0.0148	6.6200e-003	0.0214		221.8421	221.8421	0.0178		222.2859
Worker	0.1046	0.0642	0.8441	2.1700e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		216.1292	216.1292	6.0500e-003		216.2805
Total	**0.1313**	**0.9749**	**1.0147**	**4.2800e-003**	**0.2636**	**8.2300e-003**	**0.2718**	**0.0711**	**7.8300e-003**	**0.0789**		**437.9713**	**437.9713**	**0.0238**		**438.5664**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089		2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**		**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0223	0.8231	0.1506	2.0900e-003	0.0512	4.6800e-003	0.0559	0.0148	4.4800e-003	0.0192		220.3127	220.3127	0.0165		220.7259
Worker	0.0967	0.0572	0.7661	2.1000e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		209.3030	209.3030	5.3600e-003		209.4371
Total	**0.1190**	**0.8803**	**0.9167**	**4.1900e-003**	**0.2636**	**5.9700e-003**	**0.2696**	**0.0711**	**5.6600e-003**	**0.0767**		**429.6157**	**429.6157**	**0.0219**		**430.1629**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089	0.0000	2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**	**0.0000**	**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0223	0.8231	0.1506	2.0900e-003	0.0512	4.6800e-003	0.0559	0.0148	4.4800e-003	0.0192		220.3127	220.3127	0.0165		220.7259
Worker	0.0967	0.0572	0.7661	2.1000e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		209.3030	209.3030	5.3600e-003		209.4371
Total	**0.1190**	**0.8803**	**0.9167**	**4.1900e-003**	**0.2636**	**5.9700e-003**	**0.2696**	**0.0711**	**5.6600e-003**	**0.0767**		**429.6157**	**429.6157**	**0.0219**		**430.1629**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051		1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**		**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0451	0.6048	1.6600e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		165.2392	165.2392	4.2400e-003		165.3451
Total	**0.0763**	**0.0451**	**0.6048**	**1.6600e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**165.2392**	**165.2392**	**4.2400e-003**		**165.3451**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051	0.0000	1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**	**0.0000**	**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0451	0.6048	1.6600e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		165.2392	165.2392	4.2400e-003		165.3451
Total	**0.0763**	**0.0451**	**0.6048**	**1.6600e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**165.2392**	**165.2392**	**4.2400e-003**		**165.3451**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0204	0.0120	0.1613	4.4000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		44.0638	44.0638	1.1300e-003		44.0920
Total	**0.0204**	**0.0120**	**0.1613**	**4.4000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**44.0638**	**44.0638**	**1.1300e-003**		**44.0920**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0204	0.0120	0.1613	4.4000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		44.0638	44.0638	1.1300e-003		44.0920
Total	**0.0204**	**0.0120**	**0.1613**	**4.4000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**44.0638**	**44.0638**	**1.1300e-003**		**44.0920**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.8278	47.5717	42.8931	0.1475	7.3225	0.1202	7.4427	1.9594	0.1131	2.0725		15,142.2336	15,142.2336	1.4914		15,179.5177
Unmitigated	7.9267	48.5745	45.8825	0.1598	8.3021	0.1316	8.4337	2.2216	0.1238	2.3454		16,390.2894	16,390.2894	1.5273		16,428.4705

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant with Drive Thru	1,260.14	1,833.96	1378.51	1,430,223	1,261,457
Gasoline/Service Station	2,930.04	3,034.08	3034.08	1,914,344	1,688,451
Parking Lot	0.00	0.00	0.00		
Total	4,190.18	4,868.04	4,412.59	3,344,567	2,949,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant with Drive	16.60	8.40	6.90	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food Restaurant with Drive Thru	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Gasoline/Service Station	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Parking Lot	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
NaturalGas Unmitigated	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1905.09	0.0206	0.1868	0.1569	1.1200e-003		0.0142	0.0142		0.0142	0.0142		224.1283	224.1283	4.3000e-003	4.1100e-003	225.4601
Gasoline/Service Station	1286.43	0.0139	0.1261	0.1059	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3442	151.3442	2.9000e-003	2.7700e-003	152.2436
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0344**	**0.3129**	**0.2628**	**1.8800e-003**		**0.0238**	**0.0238**		**0.0238**	**0.0238**		**375.4725**	**375.4725**	**7.2000e-003**	**6.8800e-003**	**377.7037**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1.74275	0.0188	0.1709	0.1435	1.0300e-003		0.0130	0.0130		0.0130	0.0130		205.0293	205.0293	3.9300e-003	3.7600e-003	206.2477
Gasoline/Service Station	1.10397	0.0119	0.1082	0.0909	6.5000e-004		8.2300e-003	8.2300e-003		8.2300e-003	8.2300e-003		129.8793	129.8793	2.4900e-003	2.3800e-003	130.6512
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0307**	**0.2791**	**0.2344**	**1.6800e-003**		**0.0212**	**0.0212**		**0.0212**	**0.0212**		**334.9087**	**334.9087**	**6.4200e-003**	**6.1400e-003**	**336.8989**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Unmitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Kassab Travel Center

Riverside-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	78.00	Space	2.00	31,200.00	0
Fast Food Restaurant with Drive Thru	2.54	1000sqft	0.24	2,543.00	0
Gasoline/Service Station	18.00	Pump	0.60	14,452.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Kassab Travel Center - Riverside-South Coast County, Winter

Project Characteristics - Opening Year 2020

Land Use - 18-Pump, 14,452 SF Gas Sttion on 0.6 AC; 2.543 SF Fast Food Restaurant with Drive-Thru on 0.24 AC; and 78-space Parking Lot on 2 AC.

Construction Phase - 5 days Site Prep; 10 days Grading; 220 days Building Construction; 10 days Paving; and 10 days Painting.

Trips and VMT - To account for water trucks, 6 vendor trips added to Site Prep and Grading phases.

Grading -

Vehicle Trips - Gas Service Station Trip Rate of 162.78 obtained from the Traffic Impact Analysis revised by Dudek, August 2018.

Energy Use -

Sequestration - Required to plant 47 new miscellaneous trees.

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected.

Mobile Land Use Mitigation - Increase transit to nearest busstop (0.02 miles from the project site) and provide sidewalks onsite and connecting offsite.

Energy Mitigation - Exceed Title 24 by 30% and improve lighting efficiency by 25%.

Water Mitigation - Install low-flow fixtures and water-efficient irrigation systems.

Waste Mitigation - 50% reduction in waste.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	2,540.00	2,543.00
tblLandUse	LandUseSquareFeet	2,541.15	14,452.00
tblLandUse	LotAcreage	0.70	2.00
tblLandUse	LotAcreage	0.06	0.24
tblLandUse	LotAcreage	0.06	0.60
tblSequestration	NumberOfNewTrees	0.00	47.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblVehicleTrips	WD_TR	168.56	162.78

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6882	23.4608	16.1370	0.0290	6.7025	1.0985	7.7815	3.4082	1.0528	4.4010	0.0000	2,719.5946	2,719.5946	0.7847	0.0000	2,732.2442
2020	16.8846	18.3116	15.6932	0.0289	0.2636	0.9542	1.2178	0.0711	0.9146	0.9857	0.0000	2,688.6867	2,688.6867	0.5454	0.0000	2,700.8767
Maximum	**16.8846**	**23.4608**	**16.1370**	**0.0290**	**6.7025**	**1.0985**	**7.7815**	**3.4082**	**1.0528**	**4.4010**	**0.0000**	**2,719.5946**	**2,719.5946**	**0.7847**	**0.0000**	**2,732.2442**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6882	23.4608	16.1370	0.0290	2.7056	1.0985	3.7845	1.3540	1.0528	2.3468	0.0000	2,719.5946	2,719.5946	0.7847	0.0000	2,732.2442
2020	16.8846	18.3116	15.6932	0.0289	0.2636	0.9542	1.2178	0.0711	0.9146	0.9857	0.0000	2,688.6867	2,688.6867	0.5454	0.0000	2,700.8767
Maximum	**16.8846**	**23.4608**	**16.1370**	**0.0290**	**2.7056**	**1.0985**	**3.7845**	**1.3540**	**1.0528**	**2.3468**	**0.0000**	**2,719.5946**	**2,719.5946**	**0.7847**	**0.0000**	**2,732.2442**

Kassab Travel Center - Riverside-South Coast County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	57.38	0.00	44.41	59.04	0.00	38.13	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037
Mobile	6.5220	47.5069	45.0666	0.1458	8.3021	0.1354	8.4376	2.2216	0.1274	2.3490		14,957.6547	14,957.6547	1.6705		14,999.4164
Total	**6.9505**	**47.8198**	**45.3396**	**0.1477**	**8.3021**	**0.1592**	**8.4614**	**2.2216**	**0.1513**	**2.3729**		**15,333.1488**	**15,333.1488**	**1.6777**	**6.8800e-003**	**15,377.1432**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Energy	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
Mobile	6.4298	46.4543	42.6746	0.1345	7.3225	0.1241	7.4466	1.9594	0.1167	2.0762		13,799.3952	13,799.3952	1.6373		13,840.3282
Total	**6.8545**	**46.7335**	**42.9192**	**0.1361**	**7.3225**	**0.1453**	**7.4678**	**1.9594**	**0.1380**	**2.0974**		**14,134.3254**	**14,134.3254**	**1.6438**	**6.1400e-003**	**14,177.2501**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	1.38	2.27	5.34	7.85	11.80	8.74	11.74	11.80	8.77	11.61	0.00	7.82	7.82	2.02	10.76	7.80

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2019	3/7/2019	5	5	
2	Grading	Grading	3/8/2019	3/21/2019	5	10	
3	Building Construction	Building Construction	3/22/2019	1/23/2020	5	220	
4	Paving	Paving	1/24/2020	2/6/2020	5	10	
5	Architectural Coating	Architectural Coating	2/7/2020	2/20/2020	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5

Acres of Paving: 2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 25,493; Non-Residential Outdoor: 8,498; Striped Parking Area: 1,872 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	19.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854		2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**1.5908**	**0.8537**	**2.4445**	**0.1718**	**0.7854**	**0.9572**		**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0430	0.0280	0.2880	8.2000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		81.6414	81.6414	2.2200e-003		81.6968
Total	**0.0640**	**0.7094**	**0.4369**	**2.3400e-003**	**0.1278**	**5.8000e-003**	**0.1337**	**0.0348**	**5.5300e-003**	**0.0403**		**241.8046**	**241.8046**	**0.0170**		**242.2297**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6204	0.0000	0.6204	0.0670	0.0000	0.0670			0.0000			0.0000
Off-Road	1.7557	21.5386	11.9143	0.0245		0.8537	0.8537		0.7854	0.7854	0.0000	2,426.5408	2,426.5408	0.7677		2,445.7341
Total	**1.7557**	**21.5386**	**11.9143**	**0.0245**	**0.6204**	**0.8537**	**1.4741**	**0.0670**	**0.7854**	**0.8524**	**0.0000**	**2,426.5408**	**2,426.5408**	**0.7677**		**2,445.7341**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0430	0.0280	0.2880	8.2000e-004	0.0894	5.5000e-004	0.0900	0.0237	5.1000e-004	0.0242		81.6414	81.6414	2.2200e-003		81.6968
Total	**0.0640**	**0.7094**	**0.4369**	**2.3400e-003**	**0.1278**	**5.8000e-003**	**0.1337**	**0.0348**	**5.5300e-003**	**0.0403**		**241.8046**	**241.8046**	**0.0170**		**242.2297**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871		2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**6.5523**	**1.0730**	**7.6253**	**3.3675**	**0.9871**	**4.3546**		**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0538	0.0350	0.3601	1.0200e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		102.0517	102.0517	2.7700e-003		102.1209
Total	**0.0748**	**0.7164**	**0.5089**	**2.5400e-003**	**0.1502**	**5.9400e-003**	**0.1562**	**0.0407**	**5.6600e-003**	**0.0464**		**262.2149**	**262.2149**	**0.0176**		**262.6539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.5554	0.0000	2.5554	1.3133	0.0000	1.3133			0.0000			0.0000
Off-Road	2.0287	22.7444	10.1518	0.0206		1.0730	1.0730		0.9871	0.9871	0.0000	2,041.2539	2,041.2539	0.6458		2,057.3997
Total	**2.0287**	**22.7444**	**10.1518**	**0.0206**	**2.5554**	**1.0730**	**3.6284**	**1.3133**	**0.9871**	**2.3005**	**0.0000**	**2,041.2539**	**2,041.2539**	**0.6458**		**2,057.3997**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0210	0.6815	0.1488	1.5200e-003	0.0384	5.2500e-003	0.0437	0.0111	5.0200e-003	0.0161		160.1632	160.1632	0.0148		160.5329
Worker	0.0538	0.0350	0.3601	1.0200e-003	0.1118	6.9000e-004	0.1125	0.0296	6.4000e-004	0.0303		102.0517	102.0517	2.7700e-003		102.1209
Total	**0.0748**	**0.7164**	**0.5089**	**2.5400e-003**	**0.1502**	**5.9400e-003**	**0.1562**	**0.0407**	**5.6600e-003**	**0.0464**		**262.2149**	**262.2149**	**0.0176**		**262.6539**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449		2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**		**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0280	0.9086	0.1984	2.0300e-003	0.0512	7.0000e-003	0.0582	0.0148	6.7000e-003	0.0215		213.5509	213.5509	0.0197		214.0439
Worker	0.1022	0.0665	0.6841	1.9500e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		193.8983	193.8983	5.2600e-003		194.0298
Total	**0.1302**	**0.9751**	**0.8825**	**3.9800e-003**	**0.2636**	**8.3100e-003**	**0.2719**	**0.0711**	**7.9100e-003**	**0.0790**		**407.4492**	**407.4492**	**0.0250**		**408.0737**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5581	18.9103	15.2545	0.0250		1.0901	1.0901		1.0449	1.0449	0.0000	2,312.1454	2,312.1454	0.4810		2,324.1705
Total	**2.5581**	**18.9103**	**15.2545**	**0.0250**		**1.0901**	**1.0901**		**1.0449**	**1.0449**	**0.0000**	**2,312.1454**	**2,312.1454**	**0.4810**		**2,324.1705**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0280	0.9086	0.1984	2.0300e-003	0.0512	7.0000e-003	0.0582	0.0148	6.7000e-003	0.0215		213.5509	213.5509	0.0197		214.0439
Worker	0.1022	0.0665	0.6841	1.9500e-003	0.2124	1.3100e-003	0.2137	0.0563	1.2100e-003	0.0575		193.8983	193.8983	5.2600e-003		194.0298
Total	**0.1302**	**0.9751**	**0.8825**	**3.9800e-003**	**0.2636**	**8.3100e-003**	**0.2719**	**0.0711**	**7.9100e-003**	**0.0790**		**407.4492**	**407.4492**	**0.0250**		**408.0737**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089		2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**		**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0235	0.8188	0.1763	2.0100e-003	0.0512	4.7400e-003	0.0560	0.0148	4.5300e-003	0.0193		212.0342	212.0342	0.0184		212.4939
Worker	0.0947	0.0592	0.6197	1.8800e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		187.7648	187.7648	4.6600e-003		187.8814
Total	**0.1182**	**0.8780**	**0.7961**	**3.8900e-003**	**0.2636**	**6.0300e-003**	**0.2696**	**0.0711**	**5.7100e-003**	**0.0768**		**399.7990**	**399.7990**	**0.0231**		**400.3753**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2879	17.4336	14.8972	0.0250		0.9482	0.9482		0.9089	0.9089	0.0000	2,288.8877	2,288.8877	0.4646		2,300.5014
Total	**2.2879**	**17.4336**	**14.8972**	**0.0250**		**0.9482**	**0.9482**		**0.9089**	**0.9089**	**0.0000**	**2,288.8877**	**2,288.8877**	**0.4646**		**2,300.5014**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0235	0.8188	0.1763	2.0100e-003	0.0512	4.7400e-003	0.0560	0.0148	4.5300e-003	0.0193		212.0342	212.0342	0.0184		212.4939
Worker	0.0947	0.0592	0.6197	1.8800e-003	0.2124	1.2900e-003	0.2137	0.0563	1.1800e-003	0.0575		187.7648	187.7648	4.6600e-003		187.8814
Total	**0.1182**	**0.8780**	**0.7961**	**3.8900e-003**	**0.2636**	**6.0300e-003**	**0.2696**	**0.0711**	**5.7100e-003**	**0.0768**		**399.7990**	**399.7990**	**0.0231**		**400.3753**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051		1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**		**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0748	0.0467	0.4893	1.4900e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		148.2354	148.2354	3.6800e-003		148.3274
Total	**0.0748**	**0.0467**	**0.4893**	**1.4900e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**148.2354**	**148.2354**	**3.6800e-003**		**148.3274**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1547	11.5873	11.8076	0.0178		0.6565	0.6565		0.6051	0.6051	0.0000	1,709.2180	1,709.2180	0.5417		1,722.7605
Paving	0.5240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6787**	**11.5873**	**11.8076**	**0.0178**		**0.6565**	**0.6565**		**0.6051**	**0.6051**	**0.0000**	**1,709.2180**	**1,709.2180**	**0.5417**		**1,722.7605**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0748	0.0467	0.4893	1.4900e-003	0.1677	1.0200e-003	0.1687	0.0445	9.3000e-004	0.0454		148.2354	148.2354	3.6800e-003		148.3274
Total	**0.0748**	**0.0467**	**0.4893**	**1.4900e-003**	**0.1677**	**1.0200e-003**	**0.1687**	**0.0445**	**9.3000e-004**	**0.0454**		**148.2354**	**148.2354**	**3.6800e-003**		**148.3274**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0199	0.0125	0.1305	4.0000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		39.5294	39.5294	9.8000e-004		39.5540
Total	**0.0199**	**0.0125**	**0.1305**	**4.0000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**39.5294**	**39.5294**	**9.8000e-004**		**39.5540**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.6225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**16.8647**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0199	0.0125	0.1305	4.0000e-004	0.0447	2.7000e-004	0.0450	0.0119	2.5000e-004	0.0121		39.5294	39.5294	9.8000e-004		39.5540
Total	**0.0199**	**0.0125**	**0.1305**	**4.0000e-004**	**0.0447**	**2.7000e-004**	**0.0450**	**0.0119**	**2.5000e-004**	**0.0121**		**39.5294**	**39.5294**	**9.8000e-004**		**39.5540**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.4298	46.4543	42.6746	0.1345	7.3225	0.1241	7.4466	1.9594	0.1167	2.0762		13,799.3952	13,799.3952	1.6373		13,840.3282
Unmitigated	6.5220	47.5069	45.0666	0.1458	8.3021	0.1354	8.4376	2.2216	0.1274	2.3490		14,957.6547	14,957.6547	1.6705		14,999.4164

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant with Drive Thru	1,260.14	1,833.96	1378.51	1,430,223	1,261,457
Gasoline/Service Station	2,930.04	3,034.08	3034.08	1,914,344	1,688,451
Parking Lot	0.00	0.00	0.00		
Total	4,190.18	4,868.04	4,412.59	3,344,567	2,949,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant with Drive	16.60	8.40	6.90	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food Restaurant with Drive Thru	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Gasoline/Service Station	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Parking Lot	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0307	0.2791	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212		334.9087	334.9087	6.4200e-003	6.1400e-003	336.8989
NaturalGas Unmitigated	0.0344	0.3129	0.2628	1.8800e-003		0.0238	0.0238		0.0238	0.0238		375.4725	375.4725	7.2000e-003	6.8800e-003	377.7037

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1905.09	0.0206	0.1868	0.1569	1.1200e-003		0.0142	0.0142		0.0142	0.0142		224.1283	224.1283	4.3000e-003	4.1100e-003	225.4601
Gasoline/Service Station	1286.43	0.0139	0.1261	0.1059	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3442	151.3442	2.9000e-003	2.7700e-003	152.2436
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0344**	**0.3129**	**0.2628**	**1.8800e-003**		**0.0238**	**0.0238**		**0.0238**	**0.0238**		**375.4725**	**375.4725**	**7.2000e-003**	**6.8800e-003**	**377.7037**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant with Drive Thru	1.74275	0.0188	0.1709	0.1435	1.0300e-003		0.0130	0.0130		0.0130	0.0130		205.0293	205.0293	3.9300e-003	3.7600e-003	206.2477
Gasoline/Service Station	1.10397	0.0119	0.1082	0.0909	6.5000e-004		8.2300e-003	8.2300e-003		8.2300e-003	8.2300e-003		129.8793	129.8793	2.4900e-003	2.3800e-003	130.6512
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0307**	**0.2791**	**0.2344**	**1.6800e-003**		**0.0212**	**0.0212**		**0.0212**	**0.0212**		**334.9087**	**334.9087**	**6.4200e-003**	**6.1400e-003**	**336.8989**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Unmitigated	0.3941	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0455					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3476					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0101	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0216	0.0216	6.0000e-005		0.0230
Total	**0.3940**	**9.0000e-005**	**0.0101**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0216**	**0.0216**	**6.0000e-005**		**0.0230**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B

CalEEMod Model Year 2020 Annual Printouts

Kassab Travel Center

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	78.00	Space	2.00	31,200.00	0
Fast Food Restaurant with Drive Thru	2.54	1000sqft	0.24	2,543.00	0
Gasoline/Service Station	18.00	Pump	0.60	14,452.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Opening Year 2020

Land Use - 18-Pump, 14,452 SF Gas Sttion on 0.6 AC; 2.543 SF Fast Food Restaurant with Drive-Thru on 0.24 AC; and 78-space Parking Lot on 2 AC.

Construction Phase - 5 days Site Prep; 10 days Grading; 220 days Building Construction; 10 days Paving; and 10 days Painting.

Trips and VMT - To account for water trucks, 6 vendor trips added to Site Prep and Grading phases.

Grading -

Vehicle Trips - Gas Service Station Trip Rate of 162.78 obtained from the Traffic Impact Analysis revised by Dudek, August 2018.

Energy Use -

Sequestration - Required to plant 47 new miscellaneous trees.

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected.

Mobile Land Use Mitigation - Increase transit to nearest busstop (0.02 miles from the project site) and provide sidewalks onsite and connecting offsite.

Energy Mitigation - Exceed Title 24 by 30% and improve lighting efficiency by 25%.

Water Mitigation - Install low-flow fixtures and water-efficient irrigation systems.

Waste Mitigation - 50% reduction in waste.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	3.00	5.00
tblLandUse	LandUseSquareFeet	2,540.00	2,543.00
tblLandUse	LandUseSquareFeet	2,541.15	14,452.00
tblLandUse	LotAcreage	0.70	2.00
tblLandUse	LotAcreage	0.06	0.24
tblLandUse	LotAcreage	0.06	0.60
tblSequestration	NumberOfNewTrees	0.00	47.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblVehicleTrips	WD_TR	168.56	162.78

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2870	2.1931	1.7244	3.1400e-003	0.0641	0.1190	0.1832	0.0247	0.1138	0.1385	0.0000	267.8615	267.8615	0.0513	0.0000	269.1437
2020	0.1135	0.2224	0.2050	3.6000e-004	3.2500e-003	0.0120	0.0152	8.7000e-004	0.0114	0.0122	0.0000	30.7101	30.7101	6.3300e-003	0.0000	30.8683
Maximum	**0.2870**	**2.1931**	**1.7244**	**3.1400e-003**	**0.0641**	**0.1190**	**0.1832**	**0.0247**	**0.1138**	**0.1385**	**0.0000**	**267.8615**	**267.8615**	**0.0513**	**0.0000**	**269.1437**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2870	2.1931	1.7244	3.1400e-003	0.0417	0.1190	0.1607	0.0141	0.1138	0.1279	0.0000	267.8612	267.8612	0.0513	0.0000	269.1434
2020	0.1135	0.2224	0.2050	3.6000e-004	3.2500e-003	0.0120	0.0152	8.7000e-004	0.0114	0.0122	0.0000	30.7100	30.7100	6.3300e-003	0.0000	30.8683
Maximum	**0.2870**	**2.1931**	**1.7244**	**3.1400e-003**	**0.0417**	**0.1190**	**0.1607**	**0.0141**	**0.1138**	**0.1279**	**0.0000**	**267.8612**	**267.8612**	**0.0513**	**0.0000**	**269.1434**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**33.26**	**0.00**	**11.30**	**41.25**	**0.00**	**6.99**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**3-1-2019**	**5-31-2019**	0.7604	0.7604
2	**6-1-2019**	**8-31-2019**	0.7417	0.7417
3	**9-1-2019**	**11-30-2019**	0.7336	0.7336
4	**12-1-2019**	**2-29-2020**	0.5799	0.5799
		Highest	0.7604	0.7604

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Energy	6.2800e-003	0.0571	0.0480	3.4000e-004		4.3400e-003	4.3400e-003		4.3400e-003	4.3400e-003	0.0000	150.8518	150.8518	4.8500e-003	1.9000e-003	151.5385
Mobile	1.0433	7.7807	7.1283	0.0239	1.2771	0.0210	1.2981	0.3422	0.0198	0.3620	0.0000	2,224.2817	2,224.2817	0.2309	0.0000	2,230.0542
Waste						0.0000	0.0000		0.0000	0.0000	7.9085	0.0000	7.9085	0.4674	0.0000	19.5930
Water						0.0000	0.0000		0.0000	0.0000	0.3204	4.8834	5.2038	0.0331	8.2000e-004	6.2757
Total	**1.1215**	**7.8378**	**7.1775**	**0.0242**	**1.2771**	**0.0253**	**1.3024**	**0.3422**	**0.0241**	**0.3663**	**8.2290**	**2,380.0193**	**2,388.2482**	**0.7363**	**2.7200e-003**	**2,407.4640**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Energy	5.6000e-003	0.0509	0.0428	3.1000e-004		3.8700e-003	3.8700e-003		3.8700e-003	3.8700e-003	0.0000	132.5038	132.5038	4.2400e-003	1.6700e-003	133.1090
Mobile	1.0286	7.6141	6.7334	0.0221	1.1264	0.0192	1.1456	0.3018	0.0181	0.3199	0.0000	2,057.3113	2,057.3113	0.2261	0.0000	2,062.9643
Waste						0.0000	0.0000		0.0000	0.0000	3.9543	0.0000	3.9543	0.2337	0.0000	9.7965
Water						0.0000	0.0000		0.0000	0.0000	0.2705	4.1874	4.4578	0.0280	6.9000e-004	5.3627
Total	**1.1061**	**7.6650**	**6.7775**	**0.0224**	**1.1264**	**0.0231**	**1.1495**	**0.3018**	**0.0220**	**0.3238**	**4.2247**	**2,194.0050**	**2,198.2297**	**0.4920**	**2.3600e-003**	**2,211.2351**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**1.37**	**2.20**	**5.57**	**7.59**	**11.80**	**8.84**	**11.74**	**11.80**	**8.88**	**11.61**	**48.66**	**7.82**	**7.96**	**33.17**	**13.24**	**8.15**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	33.2760
Total	**33.2760**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2019	3/7/2019	5	5	
2	Grading	Grading	3/8/2019	3/21/2019	5	10	
3	Building Construction	Building Construction	3/22/2019	1/23/2020	5	220	
4	Paving	Paving	1/24/2020	2/6/2020	5	10	
5	Architectural Coating	Architectural Coating	2/7/2020	2/20/2020	5	10	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 5

Acres of Paving: 2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 25,493; Non-Residential Outdoor: 8,498; Striped Parking Area: 1,872 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	6.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	19.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9800e-003	0.0000	3.9800e-003	4.3000e-004	0.0000	4.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	**4.3900e-003**	**0.0539**	**0.0298**	**6.0000e-005**	**3.9800e-003**	**2.1300e-003**	**6.1100e-003**	**4.3000e-004**	**1.9600e-003**	**2.3900e-003**	**0.0000**	**5.5033**	**5.5033**	**1.7400e-003**	**0.0000**	**5.5468**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.7300e-003	3.4000e-004	0.0000	9.0000e-005	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3714	0.3714	3.0000e-005	0.0000	0.3722
Worker	1.0000e-004	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1899	0.1899	1.0000e-005	0.0000	0.1901
Total	**1.5000e-004**	**1.8000e-003**	**1.1000e-003**	**0.0000**	**3.1000e-004**	**1.0000e-005**	**3.3000e-004**	**9.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.5613**	**0.5613**	**4.0000e-005**	**0.0000**	**0.5623**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5500e-003	0.0000	1.5500e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3900e-003	0.0539	0.0298	6.0000e-005		2.1300e-003	2.1300e-003		1.9600e-003	1.9600e-003	0.0000	5.5033	5.5033	1.7400e-003	0.0000	5.5468
Total	**4.3900e-003**	**0.0539**	**0.0298**	**6.0000e-005**	**1.5500e-003**	**2.1300e-003**	**3.6800e-003**	**1.7000e-004**	**1.9600e-003**	**2.1300e-003**	**0.0000**	**5.5033**	**5.5033**	**1.7400e-003**	**0.0000**	**5.5468**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.7300e-003	3.4000e-004	0.0000	9.0000e-005	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3714	0.3714	3.0000e-005	0.0000	0.3722
Worker	1.0000e-004	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1899	0.1899	1.0000e-005	0.0000	0.1901
Total	**1.5000e-004**	**1.8000e-003**	**1.1000e-003**	**0.0000**	**3.1000e-004**	**1.0000e-005**	**3.3000e-004**	**9.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.5613**	**0.5613**	**4.0000e-005**	**0.0000**	**0.5623**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0328	0.0000	0.0328	0.0168	0.0000	0.0168	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0101	0.1137	0.0508	1.0000e-004		5.3600e-003	5.3600e-003		4.9400e-003	4.9400e-003	0.0000	9.2590	9.2590	2.9300e-003	0.0000	9.3322
Total	**0.0101**	**0.1137**	**0.0508**	**1.0000e-004**	**0.0328**	**5.3600e-003**	**0.0381**	**0.0168**	**4.9400e-003**	**0.0218**	**0.0000**	**9.2590**	**9.2590**	**2.9300e-003**	**0.0000**	**9.3322**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	3.4600e-003	6.9000e-004	1.0000e-005	1.9000e-004	3.0000e-005	2.2000e-004	5.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.7429	0.7429	6.0000e-005	0.0000	0.7444
Worker	2.5000e-004	1.8000e-004	1.9000e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4748	0.4748	1.0000e-005	0.0000	0.4751
Total	**3.5000e-004**	**3.6400e-003**	**2.5900e-003**	**2.0000e-005**	**7.4000e-004**	**3.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**1.2177**	**1.2177**	**7.0000e-005**	**0.0000**	**1.2196**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0128	0.0000	0.0128	6.5700e-003	0.0000	6.5700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0101	0.1137	0.0508	1.0000e-004		5.3600e-003	5.3600e-003		4.9400e-003	4.9400e-003	0.0000	9.2590	9.2590	2.9300e-003	0.0000	9.3322
Total	**0.0101**	**0.1137**	**0.0508**	**1.0000e-004**	**0.0128**	**5.3600e-003**	**0.0181**	**6.5700e-003**	**4.9400e-003**	**0.0115**	**0.0000**	**9.2590**	**9.2590**	**2.9300e-003**	**0.0000**	**9.3322**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	3.4600e-003	6.9000e-004	1.0000e-005	1.9000e-004	3.0000e-005	2.2000e-004	5.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.7429	0.7429	6.0000e-005	0.0000	0.7444
Worker	2.5000e-004	1.8000e-004	1.9000e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4748	0.4748	1.0000e-005	0.0000	0.4751
Total	**3.5000e-004**	**3.6400e-003**	**2.5900e-003**	**2.0000e-005**	**7.4000e-004**	**3.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.3000e-004**	**0.0000**	**1.2177**	**1.2177**	**7.0000e-005**	**0.0000**	**1.2196**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2596	1.9194	1.5483	2.5400e-003		0.1107	0.1107		0.1061	0.1061	0.0000	212.9006	212.9006	0.0443	0.0000	214.0079
Total	**0.2596**	**1.9194**	**1.5483**	**2.5400e-003**		**0.1107**	**0.1107**		**0.1061**	**0.1061**	**0.0000**	**212.9006**	**212.9006**	**0.0443**	**0.0000**	**214.0079**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7500e-003	0.0937	0.0187	2.1000e-004	5.1300e-003	7.1000e-004	5.8300e-003	1.4800e-003	6.8000e-004	2.1500e-003	0.0000	20.1064	20.1064	1.7100e-003	0.0000	20.1492
Worker	9.5800e-003	6.9800e-003	0.0732	2.0000e-004	0.0212	1.3000e-004	0.0213	5.6300e-003	1.2000e-004	5.7500e-003	0.0000	18.3132	18.3132	5.0000e-004	0.0000	18.3257
Total	**0.0123**	**0.1007**	**0.0918**	**4.1000e-004**	**0.0263**	**8.4000e-004**	**0.0272**	**7.1100e-003**	**8.0000e-004**	**7.9000e-003**	**0.0000**	**38.4196**	**38.4196**	**2.2100e-003**	**0.0000**	**38.4750**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2596	1.9194	1.5483	2.5400e-003		0.1107	0.1107		0.1061	0.1061	0.0000	212.9004	212.9004	0.0443	0.0000	214.0076
Total	**0.2596**	**1.9194**	**1.5483**	**2.5400e-003**		**0.1107**	**0.1107**		**0.1061**	**0.1061**	**0.0000**	**212.9004**	**212.9004**	**0.0443**	**0.0000**	**214.0076**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7500e-003	0.0937	0.0187	2.1000e-004	5.1300e-003	7.1000e-004	5.8300e-003	1.4800e-003	6.8000e-004	2.1500e-003	0.0000	20.1064	20.1064	1.7100e-003	0.0000	20.1492
Worker	9.5800e-003	6.9800e-003	0.0732	2.0000e-004	0.0212	1.3000e-004	0.0213	5.6300e-003	1.2000e-004	5.7500e-003	0.0000	18.3132	18.3132	5.0000e-004	0.0000	18.3257
Total	**0.0123**	**0.1007**	**0.0918**	**4.1000e-004**	**0.0263**	**8.4000e-004**	**0.0272**	**7.1100e-003**	**8.0000e-004**	**7.9000e-003**	**0.0000**	**38.4196**	**38.4196**	**2.2100e-003**	**0.0000**	**38.4750**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0195	0.1482	0.1266	2.1000e-004		8.0600e-003	8.0600e-003		7.7300e-003	7.7300e-003	0.0000	17.6498	17.6498	3.5800e-003	0.0000	17.7393
Total	**0.0195**	**0.1482**	**0.1266**	**2.1000e-004**		**8.0600e-003**	**8.0600e-003**		**7.7300e-003**	**7.7300e-003**	**0.0000**	**17.6498**	**17.6498**	**3.5800e-003**	**0.0000**	**17.7393**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.0700e-003	1.3800e-003	2.0000e-005	4.3000e-004	4.0000e-005	4.7000e-004	1.2000e-004	4.0000e-005	1.6000e-004	0.0000	1.6720	1.6720	1.3000e-004	0.0000	1.6754
Worker	7.4000e-004	5.2000e-004	5.5500e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.7900e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4851	1.4851	4.0000e-005	0.0000	1.4861
Total	**9.3000e-004**	**7.5900e-003**	**6.9300e-003**	**4.0000e-005**	**2.2100e-003**	**5.0000e-005**	**2.2600e-003**	**5.9000e-004**	**5.0000e-005**	**6.4000e-004**	**0.0000**	**3.1572**	**3.1572**	**1.7000e-004**	**0.0000**	**3.1615**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0195	0.1482	0.1266	2.1000e-004		8.0600e-003	8.0600e-003		7.7300e-003	7.7300e-003	0.0000	17.6498	17.6498	3.5800e-003	0.0000	17.7393
Total	**0.0195**	**0.1482**	**0.1266**	**2.1000e-004**		**8.0600e-003**	**8.0600e-003**		**7.7300e-003**	**7.7300e-003**	**0.0000**	**17.6498**	**17.6498**	**3.5800e-003**	**0.0000**	**17.7393**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.0700e-003	1.3800e-003	2.0000e-005	4.3000e-004	4.0000e-005	4.7000e-004	1.2000e-004	4.0000e-005	1.6000e-004	0.0000	1.6720	1.6720	1.3000e-004	0.0000	1.6754
Worker	7.4000e-004	5.2000e-004	5.5500e-003	2.0000e-005	1.7800e-003	1.0000e-005	1.7900e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4851	1.4851	4.0000e-005	0.0000	1.4861
Total	**9.3000e-004**	**7.5900e-003**	**6.9300e-003**	**4.0000e-005**	**2.2100e-003**	**5.0000e-005**	**2.2600e-003**	**5.9000e-004**	**5.0000e-005**	**6.4000e-004**	**0.0000**	**3.1572**	**3.1572**	**1.7000e-004**	**0.0000**	**3.1615**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7700e-003	0.0579	0.0590	9.0000e-005		3.2800e-003	3.2800e-003		3.0300e-003	3.0300e-003	0.0000	7.7529	7.7529	2.4600e-003	0.0000	7.8143
Paving	2.6200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3900e-003**	**0.0579**	**0.0590**	**9.0000e-005**		**3.2800e-003**	**3.2800e-003**		**3.0300e-003**	**3.0300e-003**	**0.0000**	**7.7529**	**7.7529**	**2.4600e-003**	**0.0000**	**7.8143**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.4000e-004	2.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.6897	0.6897	2.0000e-005	0.0000	0.6901
Total	**3.4000e-004**	**2.4000e-004**	**2.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6897**	**0.6897**	**2.0000e-005**	**0.0000**	**0.6901**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7700e-003	0.0579	0.0590	9.0000e-005		3.2800e-003	3.2800e-003		3.0300e-003	3.0300e-003	0.0000	7.7529	7.7529	2.4600e-003	0.0000	7.8143
Paving	2.6200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3900e-003**	**0.0579**	**0.0590**	**9.0000e-005**		**3.2800e-003**	**3.2800e-003**		**3.0300e-003**	**3.0300e-003**	**0.0000**	**7.7529**	**7.7529**	**2.4600e-003**	**0.0000**	**7.8143**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.4000e-004	2.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.6897	0.6897	2.0000e-005	0.0000	0.6901
Total	**3.4000e-004**	**2.4000e-004**	**2.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6897**	**0.6897**	**2.0000e-005**	**0.0000**	**0.6901**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2100e-003	8.4200e-003	9.1600e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.2766	1.2766	1.0000e-004	0.0000	1.2791
Total	**0.0843**	**8.4200e-003**	**9.1600e-003**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.0000e-004**	**0.0000**	**1.2791**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	6.9000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1839	0.1839	0.0000	0.0000	0.1840
Total	**9.0000e-005**	**6.0000e-005**	**6.9000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1839**	**0.1839**	**0.0000**	**0.0000**	**0.1840**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0831					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2100e-003	8.4200e-003	9.1600e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.2766	1.2766	1.0000e-004	0.0000	1.2791
Total	**0.0843**	**8.4200e-003**	**9.1600e-003**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.0000e-004**	**0.0000**	**1.2791**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	6.9000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1839	0.1839	0.0000	0.0000	0.1840
Total	**9.0000e-005**	**6.0000e-005**	**6.9000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1839**	**0.1839**	**0.0000**	**0.0000**	**0.1840**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0286	7.6141	6.7334	0.0221	1.1264	0.0192	1.1456	0.3018	0.0181	0.3199	0.0000	2,057.3113	2,057.3113	0.2261	0.0000	2,062.9643
Unmitigated	1.0433	7.7807	7.1283	0.0239	1.2771	0.0210	1.2981	0.3422	0.0198	0.3620	0.0000	2,224.2817	2,224.2817	0.2309	0.0000	2,230.0542

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant with Drive Thru	1,260.14	1,833.96	1378.51	1,430,223	1,261,457
Gasoline/Service Station	2,930.04	3,034.08	3034.08	1,914,344	1,688,451
Parking Lot	0.00	0.00	0.00		
Total	4,190.18	4,868.04	4,412.59	3,344,567	2,949,908

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant with Drive	16.60	8.40	6.90	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food Restaurant with Drive Thru	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Gasoline/Service Station	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120
Parking Lot	0.538064	0.038449	0.184390	0.122109	0.017402	0.005339	0.017250	0.067711	0.001365	0.001213	0.004629	0.000959	0.001120

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	77.0559	77.0559	3.1800e-003	6.6000e-004	77.3316
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	88.6881	88.6881	3.6600e-003	7.6000e-004	89.0054
NaturalGas Mitigated	5.6000e-003	0.0509	0.0428	3.1000e-004		3.8700e-003	3.8700e-003		3.8700e-003	3.8700e-003	0.0000	55.4479	55.4479	1.0600e-003	1.0200e-003	55.7774
NaturalGas Unmitigated	6.2800e-003	0.0571	0.0480	3.4000e-004		4.3400e-003	4.3400e-003		4.3400e-003	4.3400e-003	0.0000	62.1637	62.1637	1.1900e-003	1.1400e-003	62.5331

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant with Drive Thru	695358	3.7500e-003	0.0341	0.0286	2.0000e-004		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	37.1070	37.1070	7.1000e-004	6.8000e-004	37.3275
Gasoline/Service Station	469545	2.5300e-003	0.0230	0.0193	1.4000e-004		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	25.0567	25.0567	4.8000e-004	4.6000e-004	25.2056
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**6.2800e-003**	**0.0571**	**0.0480**	**3.4000e-004**		**4.3400e-003**	**4.3400e-003**		**4.3400e-003**	**4.3400e-003**	**0.0000**	**62.1637**	**62.1637**	**1.1900e-003**	**1.1400e-003**	**62.5331**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant with Drive Thru	636103	3.4300e-003	0.0312	0.0262	1.9000e-004		2.3700e-003	2.3700e-003		2.3700e-003	2.3700e-003	0.0000	33.9449	33.9449	6.5000e-004	6.2000e-004	34.1466
Gasoline/Service Station	402951	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003	0.0000	21.5030	21.5030	4.1000e-004	3.9000e-004	21.6308
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.6000e-003**	**0.0509**	**0.0428**	**3.1000e-004**		**3.8700e-003**	**3.8700e-003**		**3.8700e-003**	**3.8700e-003**	**0.0000**	**55.4479**	**55.4479**	**1.0600e-003**	**1.0100e-003**	**55.7774**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant with Drive Thru	120742	38.4709	1.5900e-003	3.3000e-004	38.6085
Gasoline/Service Station	146688	46.7379	1.9300e-003	4.0000e-004	46.9051
Parking Lot	10920	3.4794	1.4000e-004	3.0000e-005	3.4918
Total		**88.6881**	**3.6600e-003**	**7.6000e-004**	**89.0054**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant with Drive Thru	107088	34.1206	1.4100e-003	2.9000e-004	34.2427
Gasoline/Service Station	126563	40.3258	1.6600e-003	3.4000e-004	40.4701
Parking Lot	8190	2.6095	1.1000e-004	2.0000e-005	2.6189
Total		**77.0559**	**3.1800e-003**	**6.5000e-004**	**77.3316**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Unmitigated	0.0719	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0634					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Total	**0.0719**	**1.0000e-005**	**1.2700e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.4500e-003**	**2.4500e-003**	**1.0000e-005**	**0.0000**	**2.6100e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.3100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0634					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.2700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4500e-003	2.4500e-003	1.0000e-005	0.0000	2.6100e-003
Total	**0.0719**	**1.0000e-005**	**1.2700e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.4500e-003**	**2.4500e-003**	**1.0000e-005**	**0.0000**	**2.6100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	4.4578	0.0280	6.9000e-004	5.3627
Unmitigated	5.2038	0.0331	8.2000e-004	6.2757

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant with Drive Thru	0.770976 / 0.0492112	3.6174	0.0253	6.2000e-004	4.4343
Gasoline/Service Station	0.239074 / 0.146529	1.5864	7.8500e-003	2.0000e-004	1.8414
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**5.2038**	**0.0331**	**8.2000e-004**	**6.2757**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant with Drive Thru	0.650703 / 0.0462093	3.0696	0.0213	5.3000e-004	3.7592
Gasoline/Service Station	0.201778 / 0.137591	1.3882	6.6300e-003	1.7000e-004	1.6036
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**4.4578**	**0.0280**	**7.0000e-004**	**5.3627**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.9543	0.2337	0.0000	9.7965
Unmitigated	7.9085	0.4674	0.0000	19.5930

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant with Drive Thru	29.26	5.9395	0.3510	0.0000	14.7149
Gasoline/Service Station	9.7	1.9690	0.1164	0.0000	4.8781
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**7.9085**	**0.4674**	**0.0000**	**19.5930**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant with Drive Thru	14.63	2.9698	0.1755	0.0000	7.3575
Gasoline/Service Station	4.85	0.9845	0.0582	0.0000	2.4391
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**3.9543**	**0.2337**	**0.0000**	**9.7965**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	33.2760	0.0000	0.0000	33.2760

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	47	33.2760	0.0000	0.0000	33.2760
Total		**33.2760**	**0.0000**	**0.0000**	**33.2760**

Appendix B

Habitat Assessment

Habitat Assessment for
Kassab Travel Center
Assessor Parcel Numbers: 378-030-007, 378-030-009, and portions of 378-030-029 and 378-030-031 (Impact Area: 2.84 Acres; Total Area Surveyed: 2.84 Acres) in the City of Lake Elsinore, Riverside County, California
Elsinore USGS 7.5-Minute Series Map
Township 5 South, Range 4 West Section 31 and Range 5 West Section 36

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Surveys Conducted By:
Allison D. Rudalevige

Surveys Conducted On:
June 14, 2017

Report Date:
July 24, 2017
Revised March 15, 2018
Revised April 17, 2018

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: 4/17/2018 SIGNED: Allison D. Rudalevige

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SECTION 1.0

COUNTY OF RIVERSIDE ATTACHMENTS

Attachment E-3

BIOLOGICAL REPORT SUMMARY SHEET

(Submit two copies to the County)

Applicant Name: Environmental Advisors
Assessor's Parcel Number (APN): 378-030-007, -009, -029, -031
APN cont. : _____
Site Location: Section: 31 and 36 **Township:** 5 South **Range:** 4 and 5 West
Site Address: 29301 Riverside Drive, Lake Elsinore, CA 92530
Related Case Number(s): _____ **PDB Number:** _____

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
	Arroyo Southwestern Toad	Yes	No	N/A
✓	Blueline Stream(s)	Yes	(No)	N/A
	Coachella Valley Fringed-Toed Lizard	Yes	No	N/A
	Coastal California Gnatcatcher	Yes	No	N/A
	Coastal Sage Scrub	Yes	No	N/A
	Delhi Sands Flower-Loving Fly	Yes	No	N/A
	Desert Pupfish	Yes	No	N/A
	Desert Slender Salamander	Yes	No	N/A
	Desert Tortoise	Yes	No	N/A
	Flat-Tailed Horned Lizard	Yes	No	N/A
	Least Bell's Vireo	Yes	No	N/A
	Oak Woodlands	Yes	No	N/A
	Quino Checkerspot Butterfly	Yes	No	N/A
✓	Riverside Fairy Shrimp	Yes	(No)	N/A
	Santa Ana River Woolystar	Yes	No	N/A
	San Bernardino Kangaroo Rat	Yes	No	N/A
	Slender Horned Spineflower	Yes	No	N/A
	Stephen's Kangaroo Rat	Yes	No	N/A
✓	Vernal Pools	Yes	(No)	N/A
✓	Wetlands	Yes	(No)	N/A

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
✓	Other: Riparian Habitat	Yes	(No)	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened or candidate species by either State, or Federal regulations, or for Riverside County as listed by the California Department of Fish and Game Natural Diversity Data Base (NDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report.

Allison D. Rudaleng — 3/16/2018

Signature and Company Name — Report Date

10(a) Permit Number (if applicable) — Permit Expiration Date

County Use Only

Received by:_____ **Date:**_____

PD-B#_____

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit Two Copies)

Case Number: _____ Lot/Parcel No. 378-030-007, -009, -029, -031 **EA Number**_____

Wildlife & Vegetation

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

(Check the level of impact the applies to the following questions)

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?
☐ ☐ ☑ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?
☐ ☐ ☐ ☑

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U. S. Wildlife Service?
☐ ☐ ☑ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?
☐ ☐ ☑ ☐

e) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?
☐ ☐ ☐ ☑

f) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
☐ ☐ ☐ ☑

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
☐ ☐ ☐ ☑

Source: CGP Fig. VI.36-VI.40

Findings of Fact:
1. No Riparian/Riverine Resources, vernal pools, jurisdictional waters under the regulatory authority of the USACE and/or the CDFW would be impacted by the proposed project. Riparian habitat is adjacent to the west.
2. Nests of raptors and migratory birds may be impacted by the proposed project.

Proposed Mitigation:
1. Follow guidelines in Section 6.1.4 for Urban/Wildland Interface issues and in Section 7.5.3 for construction minimization measures.

Monitoring Recommended:
1. A pre-construction survey(s) for nesting birds and raptors is needed prior to any construction activities that occur during the nesting season (generally February 1 through June 30).

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Biological Resources Map

Attachment E-5

Kassab Travel Center

N
W E
S

100 50 0 100

Feet

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Ruderal vegetation in the southwest corner of the survey area, facing northwest.

Ruderal vegetation (background) and bare ground (foreground) in the northeast corner of the survey area, facing southwest.

Ornamental trees in the center of the survey area.

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Representative Photographs

Attachment E-6

Kassab Travel Center

PSOMAS

SECTION 2.0

HABITAT ASSESSMENT

This report presents the findings of a habitat assessment for the Kassab Travel Center project (hereinafter referred to as the "proposed project") located in the City of Lake Elsinore in Riverside County, California. The proposed project consists of a proposed travel center that includes a 6,000-square-foot convenience store with 3 quick serve restaurants; 2 covered gas-dispensing areas totaling 5,264 square feet; and a free-standing, 2,543-square-foot fast food restaurant with drive through.

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) requires that project sites be evaluated for a number of factors to assess how they meet MSHCP criteria. This information is used to determine whether a project site should be acquired as part of the habitat reserve or whether it should be allowed for development. The biological resources evaluation also assists the Lead Agency in determining whether additional mitigation would be required for Criteria Area or Additional Survey Needs Species. According to the Riverside County Integrated Project (RCIP) Conservation Summary Report Generator, the proposed project is located in designated MSHCP "Criteria Area" Cell 4266. The general habitat assessment for the proposed project includes assessments for riparian/riverine areas (and associated species) and vernal pools (and associated species) pursuant to MSHCP Section 6.1.2; urban/wildlands interface issues pursuant to MSHCP Section 6.1.4; and areas under the jurisdictions of the U.S. Army Corps of Engineers (USACE) and/or the California Department of Fish and Wildlife (CDFW) as discussed in MSHCP Section 6.1.2. This report has been prepared in accordance with the MSHCP guidelines.

GENERAL SITE INFORMATION

The proposed project is located at the southwest corner of Collier Avenue and Riverside Drive in the City of Lake Elsinore in Riverside County, California (Exhibit 1). The 2.84-acre survey area consists of Assessor Parcel Numbers (APNs) 378-030-007, 378-030-009, and portions of 378-030-029 and 378-030-031. It is on the U.S. Geological Survey's (USGS') Elsinore 7.5-minute quadrangle at Township 5 South, Range 4 West, Section 31 and Range 5 West, Section 36 (Exhibit 2). Topography in the survey area is flat with elevations ranging from approximately 1,262 to 1,268 feet above mean sea level. Two soil types, Garretson very fine sandy loam (0 to 2 percent slopes) and Pachappa fine sandy loam (0 to 2 percent slopes) occur in the survey area (Exhibit 3). Surrounding land uses consist of undeveloped open space and commercial development. Alberhill Creek occurs less than 1,000 feet west of the survey area.

MSHCP Elsinore Area Plan (Subunit 3 – Elsinore)

The survey area is partially located in Subunit 3 (Elsinore) of the Western Riverside County MSHCP's Elsinore Area Plan (Dudek 2003). The target conservation acreage range for the Elsinore Area Plan is 66,500 to 73,315 acres, the target acreage for Additional Reserve Lands within Subunit 3 is 925 to 1,815 acres, and the target acreage within the City of Lake Elsinore is 4,830 to 7,870 acres.

The Elsinore Area Plan contains the following Cores and Linkages:

- All of Proposed Constrained Linkage 5
- All of Proposed Constrained Linkage 6
- Most of Proposed Core 1
- A portion of Proposed Extension of Existing Core 2
- All of Proposed Extension of Existing Core 3
- All of Proposed Linkage 1
- All of Proposed Linkage 2
- A portion of Proposed Linkage 3

Aerial Source: Esri 2016

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Project Location

Exhibit 1

Kassab Travel Center

N
W E
S

200 100 0 200

Feet

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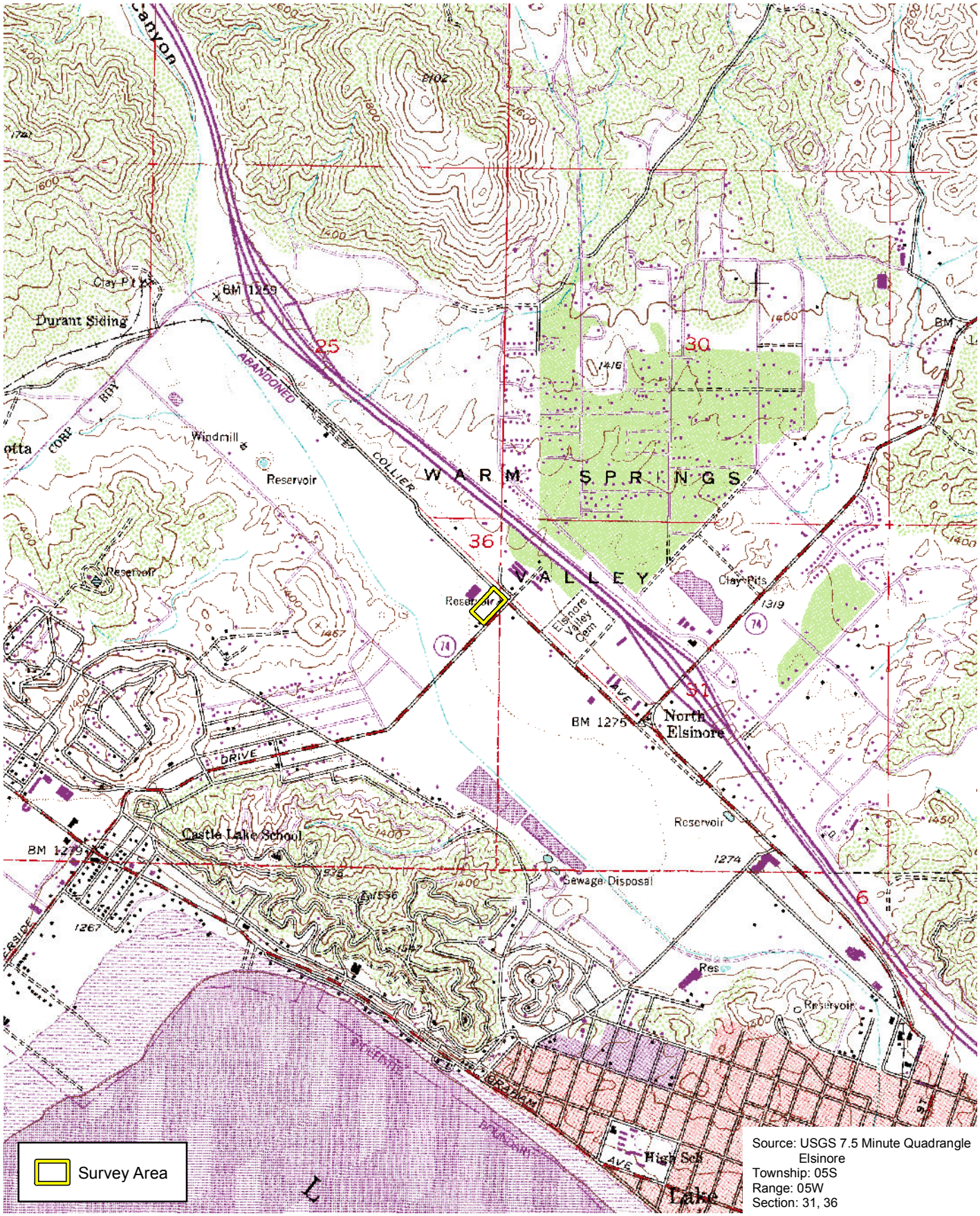

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USGS 7.5-Minute Digital Quadrangle

Exhibit 2

Kassab Travel Center

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Soil Types

Exhibit 3

Kassab Travel Center

N W E S

100 50 0 100

Feet

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- A portion of Proposed Linkage 7
- A large portion of Proposed Linkage 8

The Planning Species for Subunit 3 (Elsinore) consist of:

- American bittern (*Ixobrychus exilis*)
- Bell's [sage] sparrow (*Artemisiospiza belli*)
- black-crowned night heron (*Nycticorax nycticorax*)
- double-crested cormorant (*Phalacrocorax auritus*)
- least Bell's vireo (*Vireo bellii pusillus*)
- loggerhead shrike (*Lanius ludovicianus*)
- mountain plover (*Charadrius montanus*)
- northern harrier (*Circus cyaneus*)
- osprey (*Pandion haliaetus*)
- southwestern willow flycatcher (*Empidonax traillii extimus*)
- white-faced ibis (*Plegadis chihi*)
- Quino checkerspot butterfly (*Euphydryas editha quino*)
- *Riverside fairy shrimp (Streptocephalus woottoni*)
- Bobcat (*Lynx rufus*)
- western pond turtle (*Emys marmorata*)
- Munz's onion (*Allium munzii*)
- San Diego ambrosia (*Ambrosia pumila*)
- smooth tarplant (*Centromadia pungens* ssp. *laevis*)

The Biological Issues and Considerations for Subunit 3 (Elsinore) consist of:

- Conserve wetlands including Temescal Wash, Collier Marsh, Alberhill Creek, Lake Elsinore and the floodplain east of Lake Elsinore (including marsh Habitats) and maintain water quality.
- Conserve clay soils supporting Munz's onion.
- Conserve Travers-Willow-Domino soil series.
- Conserve foraging Habitat for raptors, providing a sage scrub-grassland ecotone.
- Conserve grassland Habitat for mountain plover.
- Conserve breeding Habitat for northern harrier.
- Maintain linkage area for bobcat.
- Conserve San Diego ambrosia at Alberhill and Nichols Road or find new populations that would allow for loss of known populations.
- Maintain Core and Linkage Habitat for western pond turtle.
- Maintain Core Area for Riverside fairy shrimp.
- Maintain opportunities for Core and Linkage Habitat for Quino checkerspot butterfly.

The survey area overlaps the eastern edge of Criteria Cell 4266 (Exhibit 4). Cell 4266 contributes to the assembly of Proposed Linkage 2. Proposed Linkage 2 is comprised of wetland habitat associated with Collier Marsh in the City of Lake Elsinore. It supports key populations of the following species: San Diego ambrosia (*Ambrosia pumila*), least Bell's vireo, yellow warbler (*Setophaga petechia*), yellow-breasted chat (*Icteria virens*), downy woodpecker (*Picoides pubescens*), and southwestern willow flycatcher (Dudek 2003). Maintenance of wetland functions and values and water quality of Collier Marsh is important for these species. Areas not affected by edge within this Linkage total approximately 70 acres of the total 160 acres occupied by this Linkage. Since this Linkage may be affected by edge, treatment and management of edge conditions will be necessary to ensure that land uses adjacent to the Linkage do not degrade water quality or inhibit floodplain processes.

Conservation within Cell 4266 will focus on meadow, marsh, riparian scrub, woodland, and forest habitat along Alberhill Creek and adjacent grassland habitat. Conserved areas will connect to meadow, marsh, and grassland proposed for conservation in Cell 4169 to the north. Conservation in the cell ranges from 30 to 40 percent of the cell, focusing on the western portion of the cell. Areas designated as Public/Quasi-Public Lands are located approximately 0.5 mile to the southwest of the survey area.

METHODS

Vegetation Mapping and General Surveys

A literature review was conducted prior to the field survey to identify special status plant and wildlife species known to occur in the project vicinity. The California Native Plant Society's (CNPS') Inventory of Rare and Endangered Plants (CNPS 2017) and the CDFW's California Natural Diversity Database (CNDDB) (CDFW 2017a) were reviewed and included the USGS Alberhill and Lake Elsinore 7.5-minute quadrangles. The RCIP Conservation Summary Report Generator was run to determine MSHCP requirements using APNs 378-030-007, 378-030-009, 378-030-029, and 378-030-031. In addition, the U.S. Department of Agriculture, Natural Resources Conservation Service's (USDA NRCS') Web Soil Survey for the Western Riverside Area was reviewed to determine whether suitable soils are present to support special status plant and wildlife species.

The habitat assessment was conducted on June 14, 2017, by Psomas Senior Biologist Allison Rudalevige. The weather was sunny with a temperature of 85 degrees Fahrenheit and winds of 1–3 miles per hour. The habitat assessment was conducted by walking the survey area and recording plant and wildlife species observed. Vegetation was mapped in the field on an aerial photograph at a scale of 1 inch equals 100 feet (1″=100′). Vegetation types were mapped and generally follow categories outlined in the Western Riverside County MSHCP Habitat Accounts (Dudek 2003). Photographs were also taken during the habitat assessment (see Attachment E-6).

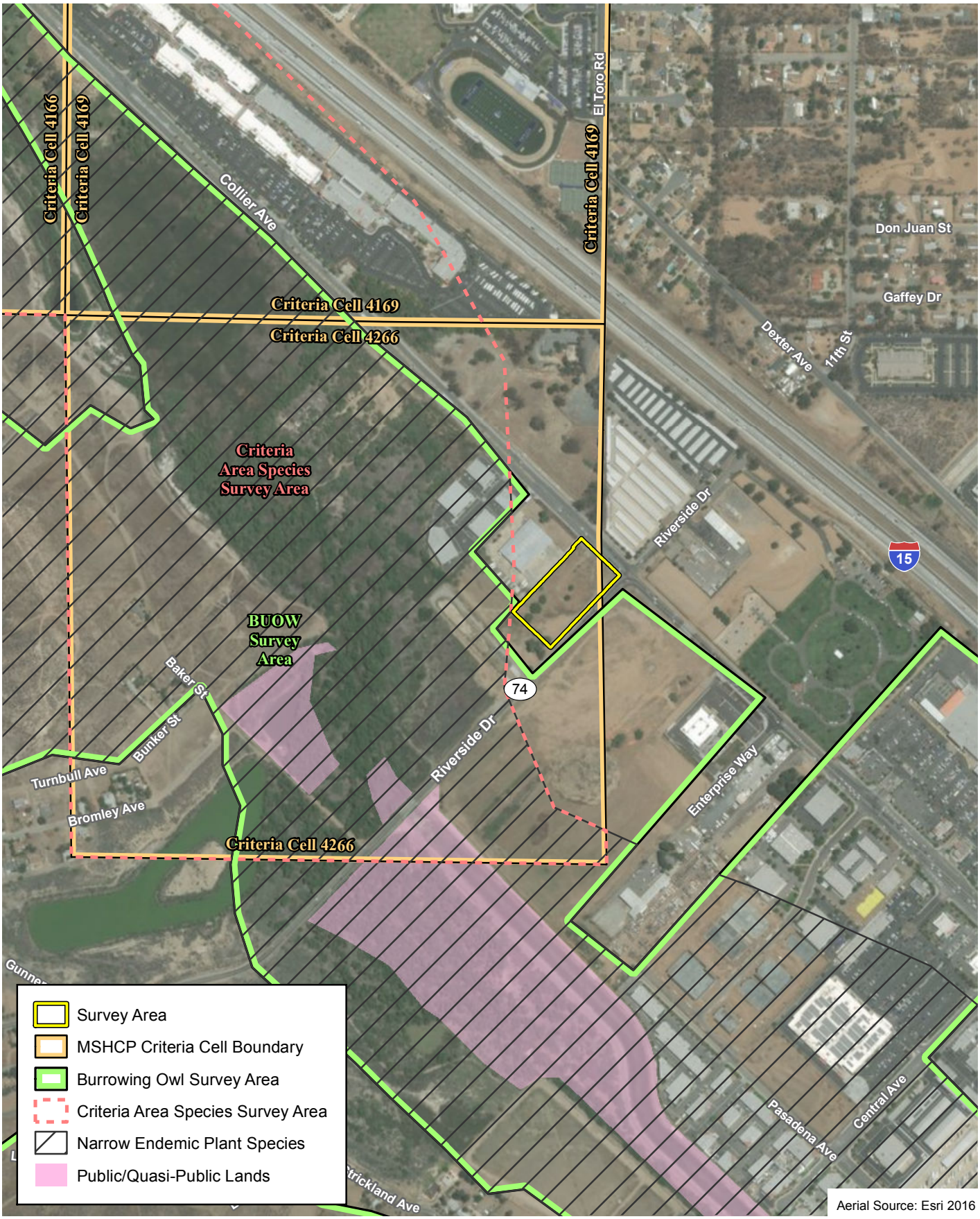
All plant and wildlife species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified using taxonomic keys in Baldwin et al. (2012), Hickman (1993), and Munz (1974). Nomenclature of plant taxa conform to the CDFW's *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2017c) for special status species and Jepson eFlora (Jepson Flora Project 2015) for all other taxa.

All wildlife species detected during the course of the surveys were documented in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by using visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic sign, including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife conform to the CDFW's *Special Animals List* (CDFW 2017b) for special status species; nomenclature for non-special status wildlife generally follows Collins and Taggart (2009) for amphibians and reptiles, American Ornithologists' Union (2015) for birds, and Smithsonian National Museum of Natural History (2011) for mammals.

EXISTING CONDITIONS

Vegetation Types and Other Areas

The following vegetation type and other landcovers occur in the survey area: ruderal, bare ground, and developed (Exhibit 5; Table 1).



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Western Riverside County Multiple Species Habitat Conservation Plan

Exhibit 4

Kassab Travel Center

N W E S

650 325 0 650

Feet

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Biological Resources

Exhibit 5

Kassab Travel Center

N
W E
S

100 50 0 100

Feet

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TABLE 1
VEGETATION TYPES AND OTHER LANDCOVER IN THE SURVEY AREA

Vegetation Type or Other Landcover	Amount in the Survey Area (acres)
ruderal	2.34
bare ground	0.43
developed	0.07
Total	**2.84**

Ruderal (weedy) vegetation occurs throughout much of the survey area. The dominant species are grayish shortpod mustard (*Hirschfeldia incana*) and London rocket (*Sisymbrium irio*). Other common herbaceous species include fiddleneck (*Amsinckia* sp.), Russian thistle (*Salsola tragus*), and annual bur-sage (*Ambrosia acanthicarpa*). Evidence of ground-disturbance (e.g., mowing, tilling) during a prior season was noted during the survey; vegetation had not been disturbed this season. Ornamental China berry (*Melia azedarach*) trees occur in the center of the survey area along with a few small Mexican palo verde (*Parkinsonia aculeata*). Ruderal vegetation follows the non-native grassland subassociation of the Grasslands vegetation association of the MSHCP habitat accounts (Dudek 2003).

Unvegetated areas consist of bare ground and developed. The portion of the survey area adjacent to Riverside Drive is bare, while a paved sidewalk is adjacent to Collier Avenue. These areas correspond to the Residential/Urban/Exotic vegetation association of the MSHCP habitat accounts (Dudek 2003).

Wildlife

The survey area provides low quality habitat for wildlife species due to the lack of native plant communities, the disturbed (i.e., tilled) nature of the survey area, and surrounding urban development. Wildlife species present are expected to be relatively urban tolerant and acclimated to human activity.

No waterbodies or water courses were observed in the survey area; therefore, fish and amphibian species are not expected to occur.

No reptile species were observed during the survey; common species that may occur in the survey area include the western fence lizard (*Sceloporus occidentalis*), western side-blotched lizard (*Uta stansburiana elegans*), and gopher snake (*Pituophis catenifer*).

Say's phoebe (*Sayornis saya*) was the only bird species observed during the survey. Other common bird species that may occur include mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), house finch (*Haemorhous mexicanus*), and lesser goldfinch (*Spinus psaltria*). Common raptor species such as red-tailed hawk (*Buteo jamaicensis*) may forage in the survey area.

The only mammal species observed during the survey was California ground squirrel (*Otospermophilus beecheyi*). Other common mammal species that may occur in the survey area include Botta's pocket gopher (*Thomomys bottae*), Virginia opossum (*Didelphis virginiana*), common raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Bat species that forage

and roost in urban areas, such as the big brown bat (*Eptesicus fuscus*), may occur in the survey area.

Wildlife Movement

The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic information. Corridors mitigate the effects of this fragmentation by (1) allowing animals to move between remaining habitats, thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events, such as fire or disease, will result in population or local species extinction; and (3) serving as travel routes for individual animals as they move in their home ranges in search of food, water, mates, and other necessary resources.

The survey area is located in an urban setting with open space, including riparian vegetation, located to the south and west. The survey area lacks native vegetation cover and is on the edge of a developed area. Wildlife species occurring in the survey area are expected to be relatively urban tolerant and acclimated to human activity given the surrounding development. The site is not fenced; therefore, wildlife may move into the survey area. Riverside Drive, Collier Avenue, and an existing building limit movement from the southeast, northeast, and northwest, respectively; therefore, the site itself would not function as a movement corridor between larger areas of open space.

Proposed Linkage 2 occurs approximately 600 feet west of the survey area. The proposed project would not directly impact this linkage. Indirect impacts on wildlife movement (e.g., edge effects) from construction noise, human activity, and ongoing use of the site is expected to be limited due to the proposed project site's distance (600 feet) from this linkage.

SPECIAL STATUS RESOURCES

Special status resources include plant and wildlife species and vegetation types. These species have generally been afforded this recognition by federal and State resource agencies and by private conservation organizations (e.g., the CNPS). In general, the principal reason an individual taxon (e.g., species, subspecies, or variety) is given such recognition is a documented or perceived decline or limitation of its population size, geographic range, and/or distribution that results, in most cases, from habitat loss.

The Riverside County Board of Supervisors approved the MSHCP in 2003 and received permitting approval from the U.S. Fish and Wildlife Service (USFWS) in June 2004. This plan establishes Criteria Areas (i.e., reserves) to adequately conserve many species listed as Threatened and Endangered by the USFWS and the CDFW. Impacts on Covered Species would be considered fully mitigated with the City's participation in the MSHCP program. With the exception of a few species (e.g., least Bell's vireo, which is a Riparian/Riverine species), focused surveys are not required for Covered Species and no additional permitting would be necessary.

Riparian/Riverine Resources

As defined by Section 6.1.2 of the MSHCP, Riparian/Riverine areas are lands that contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur

close to or depend upon soil moisture from a nearby fresh water source or areas with fresh water flow during all or a portion of the year (Dudek 2003).

No rivers, streams, or other watercourses (or vegetation associated with these features) were observed in the survey area. The closest riparian vegetation is located in a flood-control channel less than 200 feet southwest of the survey area; denser, more mature riparian habitat associated with Collier Marsh (and included as part of Proposed Linkage 2) occurs in Alberhill Creek, approximately 600 feet west of the survey area. The proposed project would not directly impact this linkage, wetland habitat associated with Collier Marsh, or habitat of key plant and wildlife populations associated with this proposed linkage (i.e., San Diego ambrosia, least Bell's vireo, yellow warbler, yellow-breasted chat, downy woodpecker, and southwestern willow flycatcher). Since the proposed project would not directly impact Riparian/Riverine areas, a Determination of Biologically Equivalent or Superior Preservation (DBESP) is not required.

While the proposed project would not directly impact riparian bird species (least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo) by removing their habitat, construction noise and human activity may indirectly impact riparian bird species if they occur in the flood-control channel's adjacent riparian habitat, approximately 200 feet southwest of the proposed project site. These activities are not expected to impact species in Alberhill Creek, since it is more than 500 feet from proposed project activities. Indirect impacts on riparian bird species could be avoided or minimized if construction activities, or at least the most noise-intensive portions of construction, can be limited to the season when these migratory birds are not present in California (i.e., September 16 to March 14). While indirect impacts should be avoided, if possible, there is no requirement to limit construction timing adjacent to riparian habitat.

Construction-related minimization measures provided in Section 7.5.3 of the MSHCP (see Appendix A) would minimize indirect impacts to adjacent riparian or riverine resources by requiring Best Management Practices (BMPs) to protect water quality.

Guidelines in Section 6.1.4 of the MSHCP (see Appendix B) would be required to ensure that adjacent riparian/riverine habitats are not indirectly impacted by long-term changes in water quality, increased noise, or increased night lighting. A further discussion of these indirect impacts is provided below.

"Waters of the U.S."/"Waters of the State"

Section 404 of the Federal Clean Water Act (CWA) and Section 1602 of the *California Fish and Game Code* regulate activities affecting resources under the jurisdiction of the USACE and the CDFW, respectively. "Waters of the U.S.", under the jurisdiction of the USACE include navigable coastal and inland waters, lakes, rivers, streams, and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce. The CDFW has jurisdictional authority over resources associated with rivers, streams, and lakes. Section 401 of the CWA provides the Regional Water Quality Control Board (RWQCB) with the authority to regulate, through a Water Quality Certification, any proposed federally permitted activity that may affect water quality. The RWQCB also has jurisdiction over isolated wetlands and waters under the Porter-Cologne Water Quality Control Act.

No drainages, waterbodies, or other water resources under the regulatory authority of the USACE, the CDFW, or the RWQCB were observed in the survey area. Therefore, there would be no impacts on jurisdictional resources and no permits, agreements, or certifications would be required from these agencies.

Vernal Pools

As defined by Section 6.1.2 the MSHCP, vernal pools are seasonal wetlands that occur in sunken areas that have wetland soils, vegetation, and hydrology during the wetter portion of the growing season, but lack hydrology and/or vegetation during the drier portion of the year (Dudek 2003).

No basins, ponds, or obvious depressional features were observed during the survey. However, a small area exhibiting surface soil cracks was present in the southwest portion of the survey area. Surface soil cracks, where clay sediment is deposited by infiltration and evaporation of water, are an indicator of hydrology and possible ponding. If the area holds surface water, it may provide habitat for vernal pool branchiopods (i.e., fairy shrimp). One fairy shrimp, Riverside fairy shrimp (*Streptocephalus woottonii*), was reported from the literature review in the project vicinity (CDFW 2017a).

Given that the survey was conducted during the dry season, it was not possible to directly determine whether this area holds water for any length of time. However, it is unlikely that the area ponds. A review of aerial Google Earth[1] imagery shows no indication of surface water or soil saturation over multiple years and seasons. In addition, the soil type mapped in the survey area is not considered hydric (USDA NRCS 2017). This area would not be considered a "vernal pool" because indicator plant species (e.g., woolly-marbles [*Psilocarphus brevissimus*], toad rush [*Juncus bufonius*], or water crassula [*Crassula aquatica*]) are not likely to be present; plant species observed in the immediate area consist of horseweed (*Erigeron canadensis*), stinknet (*Oncosiphon piluliferum*), annual bur-sage, and grayish shortpod mustard, which are considered upland or facultative upland species. For these reasons, fairy shrimp are not expected to occur in the survey area.[2]

Criteria Area, Narrow Endemic, and Other Special Status Plant Species

According to the RCIP Summary Report Generator, focused plant surveys are not required for Criteria Area or Narrow Endemic plant species.[3] Based on the literature review, nine species not covered by the MSHCP (as shown in Section 6.1.3) have been reported in the vicinity of the survey area: chaparral sand-verbena (*Abronia villosa* var. *aurita*), sticky dudleya (*Dudleya viscida*), Tecate cypress (*Hesperocyparis forbesii*), mesa horkelia (*Horkelia cuneata* var. *puberula*), Robinson's peppergrass (*Lepidium virginicum* var. *robinsonii*), intermediate monardella (*Monardella hypoleuca* ssp. *intermedia*), white rabbit-tobacco (*Pseudognaphalium leucocephalum*), San Bernardino aster (*Symphyotrichum defoliatum*), and California screw moss (*Tortula californica*). Given the ruderal nature of the survey area and apparent periodic ground disturbance, these species are not expected to occur in the survey area. Therefore, there would be no impact on these species, and no mitigation would be required.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*), a species with a California Rare Plant Rank of 1B.1, has potential to occur in the survey area because suitable habitat and soils for the species are present. In addition, it was reported to occur in a disturbed lot less than 1,000 feet away. Smooth tarplant is a Criteria Area species covered by the MSHCP. Because the survey area is located outside an "Additional Survey Needs Area" for smooth tarplant (Exhibit 4), any impacts on the species, if present, would be considered mitigated with the City's participation in the MSHCP.

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1 Images were reviewed from May 1994; May 2002; January, September, and October 2004; December 2005; January and June 2006; June and November 2009; March 2011; June 2012; January, March, and November 2013; April and September 2014; and February and October 2016.

2 It should be noted that the surveying Biologist holds a 10(a) permit to survey for fairy shrimp.

3 The Criteria Area and Narrow Endemic plant survey boundary overlaps a portion of APNs 378-030-029 and 378-030-031; however, the survey area does not extend into this area.

Special Status Wildlife Species

According to the RCIP Summary Report Generator, focused surveys are not required for burrowing owl or other Additional Survey Needs species[4] (Exhibit 4). Impacts to all other special status wildlife species with potential to occur in the survey area that would typically require mitigation in California Environmental Quality Act (CEQA) documentation are covered by the City's participation in the MSHCP.

Stephens' Kangaroo Rat

In response to the federal listing of Stephens' kangaroo rat (*Dipodomys stephensi*), the Riverside County Habitat Conservation Agency (RCHCA) was formed. Its purpose is to acquire and manage habitat for the Stephens' kangaroo rat and other associated special status species. The RCHCA Stephens' Kangaroo Rat Habitat Conservation Plan (HCP) was developed to meet the requirements of the program's Federal Endangered Species Act Section 10(a) permit. The HCP for this species is managed by the RCHCA. The HCP establishes a Reserve System where activities in the core reserve areas are limited and/or restricted. Areas outside the Reserve System are within a designated Fee Area.

The survey area is located within a designated Fee Area. For projects within a Fee Area, focused surveys for the Stephens' kangaroo rat are not required, and all potential impacts are mitigated through the RCHCA.

OTHER ISSUES

Urban/Wildlands Interface Issues

Indirect impacts, often called "edge effects", are those that affect the quality of nearby wildlife habitat resulting from disturbance by construction (such as noise, dust, and urban pollutants) and/or the long-term use of the site. Development in proximity to the MSHCP Conservation Area may result in edge effects that adversely affect biological resources within the MSHCP Conservation Area. The text below each subheading states the objective of each of these measures as described in the MSHCP.

The proposed project partially overlaps MSHCP Criteria Cell 4266 (2.67 acres within the Cell, 0.17 acre outside the Cell). Lands within Cell 4266 would provide for Proposed Linkage 2, which occurs approximately 600 feet west of the proposed project site. Although the proposed project would not directly impact Proposed Linkage 2, it could generate edge effects, as discussed below. However, in general edge effects on wildlife movement from noise and human activity are expected to be limited due to the proposed project site's distance (i.e., 600 feet) from Proposed Linkage 2.

Drainage

Proposed developments in proximity to the MSHCP Conservation Area shall incorporate measures, including measures required through the National Pollutant Discharge Elimination System (NPDES) requirements, to ensure that the quantity and quality of runoff discharged to the MSHCP Conservation Area is not altered in an adverse way when compared with existing conditions. In particular, measures shall be put in place to avoid discharge of untreated surface runoff from developed and paved areas into the MSHCP Conservation Area. Stormwater systems shall be designed to prevent the release of toxins, chemicals, petroleum products, exotic plant

[4] The burrowing owl survey boundary overlaps a portion of APNs 378-030-029 and 378-030-031; however, the survey area does not extend into this area.

materials or other elements that might degrade or harm biological resources or ecosystem processes within the MSHCP Conservation Area. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. Regular maintenance shall occur to ensure effective operations of runoff control systems.

The nearest flood-control channel occurs less than 200 feet southwest of the survey area; Alberhill Creek is approximately 600 feet west of the survey area. Stormwater runoff from construction and operation of the proposed project have the potential to adversely affect water quality in offsite drainages. Measures to protect water quality are included below to minimize adverse effects on water quality.

Toxics

Land uses proposed in proximity to the MSHCP Conservation Area that use chemicals or generate bioproducts such as manure that are potentially toxic or may adversely affect wildlife species, Habitat or water quality shall incorporate measures to ensure that application of such chemicals does not result in discharge to the MSHCP Conservation Area. Measures such as those employed to address drainage issues shall be implemented.

Petroleum products will be present on the proposed project site during construction and operation and could adversely affect the adjacent habitat. Measures are included to minimize the effects runoff of toxics into adjacent habitat areas.

Lighting

Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting. Shielding shall be incorporated in project designs to ensure ambient lighting in the MSHCP Conservation Area is not increased.

Development of the proposed project would include new lighting that may adversely affect wildlife species in adjacent open space. Measures to direct lighting away from adjacent open space are included to minimize these effects.

Noise

Proposed noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations and guidelines related to land use noise standards. For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards.

While the proposed project would create an incremental increase, noise levels are not expected to increase substantially over existing conditions considering the ambient noise from the existing development and roads adjacent to the proposed project site and the distance to Proposed Linkage 2 (600 feet). Therefore, no measures would be required.

Invasives

When approving landscape plans for Development that is proposed adjacent to the MSHCP Conservation Area, Permittees shall consider the invasive, non-native plant species (see MSHCP Table 6-2) and shall require revisions to landscape plans (subject to the limitations of their jurisdiction) to avoid the use of invasive species for the portions of development that are adjacent to the MSHCP Conservation Area. Considerations in reviewing the applicability of this list shall include proximity of planting areas to the MSHCP Conservation Areas, species considered in the

planting plans, resources being protected within the MSHCP Conservation Area and their relative sensitivity to invasion, and barriers to plant and seed dispersal, such as walls, topography and other features.

Ornamental landscaping associated with the proposed project may introduce new invasive species to the surrounding open space. Invasive species have the potential to spread into the surrounding natural open space and displace native species, hybridize with native species (thereby impacting the genetic integrity of the native species), alter biological communities, or alter ecosystem processes. This could degrade the quality of the adjacent vegetation, including vegetation communities that provide suitable habitat for Threatened or Endangered species. Measures are included for the landscaping plan to be reviewed to avoid this potential impact.

Construction equipment can also introduce non-native weed seeds to adjacent areas if equipment is not properly cleaned. While the survey area is already dominated by non-native, weedy species (i.e., grayish shortpod mustard and London rocket), these species are considered to have moderate and limited invasive impacts, respectively, by the California Invasive Plant Council (Cal-IPC).[5] Adjacent habitat could be further degraded by the use of highly invasive species (e.g., artichoke thistle [*Cynara cardunculus*]).Measures are included for vehicle washing BMPs.

Barriers

Proposed land uses adjacent to the MSHCP Conservation Area shall incorporate barriers, where appropriate in individual project designs to minimize unauthorized public access, domestic animal predation, illegal trespass or dumping in the MSHCP Conservation Area. Such barriers may include native landscaping, rocks/boulders, fencing, walls, signage and/or other appropriate mechanisms.

New land development may lead to unauthorized public access, domestic animal predation, and/or illegal trespass or dumping that may negatively affect the MSHCP Conservation Area. While the proposed project would incrementally increase human activity (i.e., a gas station, convenience store, and restaurant), this increase is not expected be a substantial increase over current conditions with existing development adjacent to the proposed project site However, measures are recommended to include landscaping or fencing to discourage public access to adjacent areas.

Grading/Land Development

Manufactured slopes associated with proposed site development shall not extend into the MSHCP Conservation Area.

Grading for the proposed project would be limited to the boundaries of the proposed project site. It would not affect Proposed Linkage 2 along Alberhill Creek. Therefore, no measures would be required.

Nesting Raptors

Trees in the survey area and immediate vicinity have potential to be used for nesting by raptors such as the American kestrel (*Falco sparverius*). Regulations prohibit activities that “take, possess

[5] Species with a high rating have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Species with a moderate rating have substantial and apparent, but generally not severe, ecological impacts. Species with a limited rating are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score (Cal-IPC 2018)

or destroy" any raptor nest or egg (*California Fish and Game Code* §§3503, 3503.5, and 3513). Additionally, the noise and disturbance associated with construction may disturb a nesting raptor if present immediately adjacent to the proposed project impact area. If construction would be initiated during the raptor nesting season (generally between February 1 and June 30), a pre-construction survey would be required to ensure that no raptor nests are impacted. If an active nest is present, construction may be temporarily restricted in the immediate vicinity of the nest until raptor nesting is complete.

Migratory Bird Treaty Act

The survey area has potential to be used by nesting birds, which are protected by the Migratory Bird Treaty Act (MBTA). Birds have potential to nest in any of the survey area's vegetation, bare ground, and also on adjacent structures. The MBTA prohibits activities that result in the direct take (defined as the killing or possession) of a migratory bird. If construction would be initiated during the peak bird nesting season (March 1 to June 30, as defined by Section 7.5.3 of the MSHCP), a pre-construction survey would be required to ensure that no nests are impacted. If an active nest is present, construction may be restricted in the immediate vicinity of the nest.

Construction Minimization Measures

Section 7.5.3 of the MSHCP contains a list of standard measures to minimize direct and indirect impacts on biological resources within and adjacent to project sites. These measures are related to protecting water quality, controlling dust, minimizing the spread of invasive plant species, minimizing fire hazards, and other measures. These measures also include requirements to mark project limits through staking/flagging and for a Biological Monitor to be present during vegetation clearing.

MSHCP CONSISTENCY

The proposed project would not directly impact Proposed Linkage 2, wetland habitat associated with Collier Marsh, or habitat of key plant and wildlife populations associated with this proposed linkage (i.e., San Diego ambrosia, least Bell's vireo, yellow warbler, yellow-breasted chat, downy woodpecker, and southwestern willow flycatcher). Indirect impacts would be avoided/minimized by implementing the Urban/Wildlands Interface Guidelines in Section 6.1.4 of the MSHCP.

The proposed project would not conflict with the conservation goals of Cell 4266. Conservation in the cell ranges from 30 to 40 percent of the cell, focusing on the western portion of the cell. The proposed project will impact 2.67 acres of the Criteria Cell along the its eastern boundary, which represents approximately 1.7 percent of the 158-acre cell (0.17 acre of the survey area is not located within a Criteria Cell). Thus, the proposed project would impact the portion of Cell 4266 outside of the area that is targeted for conservation.

Regarding the Biological Issues and Considerations for Subunit 3 (Elsinore):

- Wetlands including Temescal Wash, Collier Marsh, Alberhill Creek, Lake Elsinore and the floodplain east of Lake Elsinore (including marsh Habitats) would not be impacted by the proposed project. Implementation of the Urban/Wildlands Interface Guidelines in Section 6.1.4 of the MSHCP will maintain water quality of nearby wetlands (Collier Marsh and Alberhill Creek).
- Clay soils supporting Munz's onion are not present in the survey area.
- Travers-Willow-Domino soil series are not present in the survey area.

- Potential foraging habitat for raptors would be impacted, but the proposed project would not impact sage scrub-grassland ecotone habitat. The loss of 2.84 acres of raptor foraging habitat is not expected to substantially decrease the amount of raptor foraging habitat in the region.
- Habitat for mountain plover in the survey area is considered marginally suitable and there are no recent occurrences known from the vicinity (most are east of Perris).
- Northern harrier is not expected to breed in the survey area.
- Given the surrounding urban development, the survey area does not provide a linkage area for bobcat, although bobcat is expected to use Proposed Linkage 2 located 600 feet west of the survey area.
- The survey area is not in an area requiring focused surveys for San Diego ambrosia per Section 6.1.3 of the MSHCP. The population at Alberhill and Nichols Road would not be impacted by the proposed project.
- Core and Linkage habitat for western pond turtle is not present in the survey area.
- A Core Area for Riverside fairy shrimp is not present in the survey area.
- Core and Linkage habitat for Quino checkerspot butterfly is not present in the survey area.

RECOMMENDATIONS

The following is a list of recommendations to ensure that the proposed project is consistent with the MSHCP and other regulations protecting biological resources.

1. Drainage: A. A Storm Water Pollution Prevention Plan will be prepared and followed.

   B. Measures in the Project Specific Water Quality Management Plan (Rahman 2017) will be followed.

   - Drainage flows will be captured by the proposed ribbon gutters toward the proposed BMPs. Permeable pavements are incorporated into the Project design. These surfaces reduce the volume and peak of stormwater runoff and mitigate pollutants from stormwater runoff.
   - Washwater containing any cleaning agent or degreaser and discharge will be collected to the sanitary sewer and not to a storm drain.
   - Storm drain inlets will be marked “only rain down the storm drain”. Stormwater pollution prevention information will be provided to new site owners, lessees, or operators. A Lease agreement will include the following: “tenant shall not allow anyone to discharge anything to storm drains or store or deposit materials so as to create a potential discharge to storm drains”.

2. Toxics: Guidelines in Lake Elsinore Municipal Code Section 17.112.090 pertaining to gasoline dispensing establishments will be followed. This includes a minimum 30-foot setback of gasoline pumps and pump islands from any property line.

3. Lighting: Lighting features will be incorporated in the project design that comply with Lake Elsinore Municipal Code Section 17.112.040 Lighting (for Nonresidential Development). This includes orienting and shielding all outdoor lighting fixtures in excess of 60 watts to prevent glare or direct illumination on adjacent properties.

4. Invasives:

    A. The Landscaping Plan will be reviewed by a qualified Biologist to ensure that invasive species are not included in the plant palette. If possible, the Landscape Plan should use low water-using plants to be consistent with Assembly Bill 1881.

    B. Weed seeds entering the construction area via vehicles will be minimized by requiring construction vehicles to be washed prior to delivery to the project site. Track-clean or other methods of vehicle cleaning will be used by the construction contractor to prevent weed seeds from entering/exiting the project site on vehicles.

    C. Wattles used for erosion control will be certified as weed-free.

5. Barriers: Landscaping and/or fencing should be used to discourage public access and illegal dumping in adjacent habitat areas.

6. Vegetation removal should be planned to occur outside the peak nesting season for raptors (February 1 to June 30) and the peak nesting season for birds (March 1 to June 30). If vegetation removal would occur between February 1 and June 30, a pre-construction survey for active raptor/bird nests would be required. Restrictions may be placed on construction activities in the vicinity of any active nest until the nest is no longer active, as determined by a qualified Biologist.

7. Construction Minimization Measures in Section 7.5.3 of the MSHCP should be followed during construction (see Appendix A).

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APPENDIX A

CONSTRUCTION MINIMIZATION MEASURES

- Plans for water pollution and erosion control will be prepared for all Discretionary Projects involving the movement of earth in excess of 50 cubic yards. The plans will describe sediment and hazardous materials control, dewatering or diversion structures, fueling and equipment management practices, use of plant material for erosion control. Plans will be reviewed and approved by the County of Riverside and participating jurisdiction prior to construction.
- Timing of construction activities will consider seasonal requirements for breeding birds and migratory non-resident species. Habitat clearing will be avoided during species active breeding season defined as March 1 to June 30.
- Sediment and erosion control measures will be implemented until such time soils are determined to be successfully stabilized.
- Short-term stream diversions will be accomplished by use of sand bags or other methods that will result in minimal in-stream impacts. Short-term diversions will consider effects on wildlife.
- Silt fencing or other sediment trapping materials will be installed at the downstream end of construction activities to minimize the transport of sediments off-site.
- Settling ponds where sediment is collected will be cleaned in a manner that prevents sediment from re-entering the stream or damaging/disturbing adjacent areas. Sediment from settling ponds will be removed to a location where sediment cannot re-enter the stream or surrounding drainage area. Care will be exercised during removal of silt fencing to minimize release of debris or sediment into streams.
- No erodible materials will be deposited into water courses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks.
- The footprint of disturbance will be minimized to the maximum extent feasible. Access to sites will occur on pre-existing access routes to the greatest extent possible.
- Equipment storage, fueling and staging areas will be sited on non-sensitive upland habitat types with minimal risk of direct discharge into riparian areas or other sensitive habitat types.
- The limits of disturbance, including the upstream, downstream and lateral extents, will be clearly defined and marked in the field. Monitoring personnel will review the limits of disturbance prior to initiation of construction activities.
- During construction, the placement of equipment within the stream or on adjacent banks or adjacent upland habitats occupied by Covered Species that are outside of the project footprint will be avoided.
- Exotic species removed during construction will be properly handled to prevent sprouting or regrowth.
- Training of construction personnel will be provided.
- Ongoing monitoring and reporting will occur for the duration of the construction activity to ensure implementation of best management practices.
- When work is conducted during the fire season (as identified by the Riverside County Fire Department) adjacent to coastal sage scrub or chaparral vegetation, appropriate fire-fighting equipment (e.g., extinguishers, shovels, water tankers) shall be available on the site during all phases of project construction to help minimize the chance of human-caused wildfires. Shields, protective mats, and/or other fire preventative methods shall be used during grinding, welding, and other spark-inducing activities. Personnel trained in fire

hazards, preventative actions, and responses to fires shall advise contractors regarding fire risk from all construction-related activities.

- Active construction areas shall be watered regularly to control dust and minimize impacts to adjacent vegetation.
- All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances shall occur only in designated areas within the proposed grading limits of the project site. These designated areas shall be clearly marked and located in such a manner as to contain run-off.
- Waste, dirt, rubble, or trash shall not be deposited in the Conservation Area or on native habitat.

Appendix C

Cultural Resources Assessment for Kassab Travel Center Project

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

CULTURAL RESOURCES ASSESSMENT REPORT FOR THE KASSAB TRAVEL CENTER PROJECT, CITY OF LAKE ELSINORE, CALIFORNIA

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February 2018

Cogstone Project Number: 4083
Type of Study: Cultural Resources Assessment
Archaeological Sites: None
USGS Quadrangle: Elsinore 7.5'
Area: 2.39 acres
Key Words: Negative Survey, Luiseño, Lake Elsinore

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SUMMARY OF FINDINGS

The Kassab Travel Center proposes to construct a 6,000 square foot convenience store with three quick serve restaurants, two covered gas dispensing areas totaling 5,264 square feet, and a free standing 2,543 square foot fast food restaurant with a drive-through within Accessor's Parcel Number (APNs) 378-030-007 and 378-030-009 in the City of Lake Elsinore. The Project Area (PA) is located at the southwest corner of Riverside Drive and Collier Street in the City of Perris.

A search for archaeological and historical records was completed at the Eastern Information Center (EIC). The records search determined that there are no previously recorded cultural resources located within the PA boundaries. A total of fifteen cultural resources have been previously documented outside of the PA but within the one-mile search radius. These consist of one prehistoric archaeological site, three prehistoric archaeological isolates, six historic archaeological sites, two historic archaeological isolates and three historic built environment resources.

The City of Lake Elsinore is conducting Native American Consultations to meet their requirements under Assembly Bill 52 (AB52). Cogstone, on behalf of the City, drafted and sent the letters to the tribes on December 20, 2017. Three responses were received within the 30 day time period. As of February 20, 2018, the City of Lake Elsinore is still in consultation with the tribes.

Cogstone conducted an intensive pedestrian survey of the 2.39 acre PA. The survey was negative for cultural resources. Ground visibility was limited (30 percent) due to tall, dense, invasive weeds throughout the PA. In addition, concrete chunks and decomposed asphalt were scattered throughout the PA.

The maximum depth of excavation will be six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep. The shallow depth of excavation and the lack of archaeological sites in the project vicinity and the disturbance of the PA due to previous development (reservoir) indicate that the potential for discovery of intact archaeological deposits, including unknown buried archaeological deposits, materials, or features, by the implementation of this Project is low. No further cultural resources work is necessary.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist can evaluate it. If human remains are unearthed during excavation, State Health and Safety Code Section 7050.5 states "there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered... [has made the appropriate assessment, and] …recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code."

INTRODUCTION

PURPOSE OF STUDY

The purpose of this study is to determine the potential effects to cultural resources resulting from the construction of the Kassab Travel Center Project (Project; Figure 1). This technical study provides environmental documentation as required by the California Environmental Quality Act (CEQA). The City of Lake Elsinore is the lead agency.

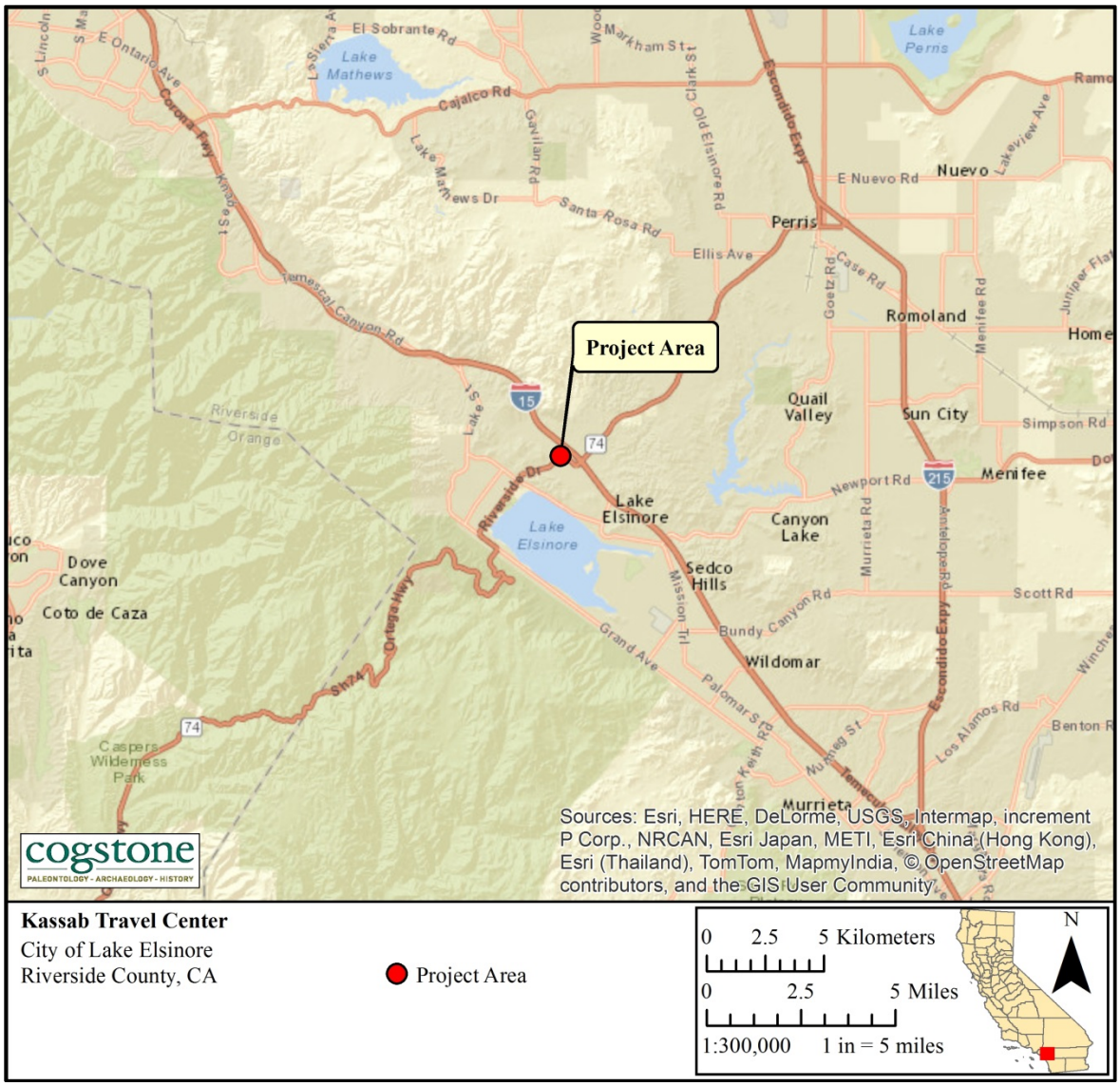

Figure 1. Project Vicinity

PROJECT LOCATION AND DESCRIPTION

The Project is located at the southwest corner of Riverside Drive and Collier Street within Accessor's Parcel Numbers (APNs) 378-030-007 and 378-030-009 in the City of Lake Elsinore. The Project is approximately 2.39 acres in size. Specifically, the Project is located within Section 31, Township 5 south, Range 4 west and Section 36, Township 5 south, Range 5 west of the Unites States Geographic Survey (USGS) Lake Elsinore 7.5-minute topographic map.

The proposed Kassab Travel Center will consist of a 6,000 square foot convenience store with three quick serve restaurants, two covered gas dispensing areas totaling 5,264 square feet, and a free standing 2,543 square foot fast food restaurant with a drive-through. The maximum depth of excavation will be six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

PROJECT PERSONNEL

Cogstone Resource Management Inc. (Cogstone) conducted the cultural resources study for this assessment. Holly Duke served as the task manager for the Project, supervising all work and prepared the majority of the report. Duke has a B.A. in Archaeology/History from Simon Fraser University, Canada, and has over five years of experience in southern California archaeology.

Molly Valasik served as the Principal Archaeologist for the Project and edited this report. Ms. Valasik has a M.A. in Anthropology from Kent State University in Ohio and eight years of experience in Southern California archaeology.

Megan Wilson prepared the maps and conducted the records search and survey. Wilson has a M.A. in Anthropology from California State University, Fullerton and has over five years of experience in southern California archaeology. Sherri Gust wrote the regulatory environment, ethnography and prehistory sections. She has an M.S. in Anatomy and a B.S. in Anthropology and more than 30 years of experience. Qualifications of Cogstone personnel are provided in Appendix A.

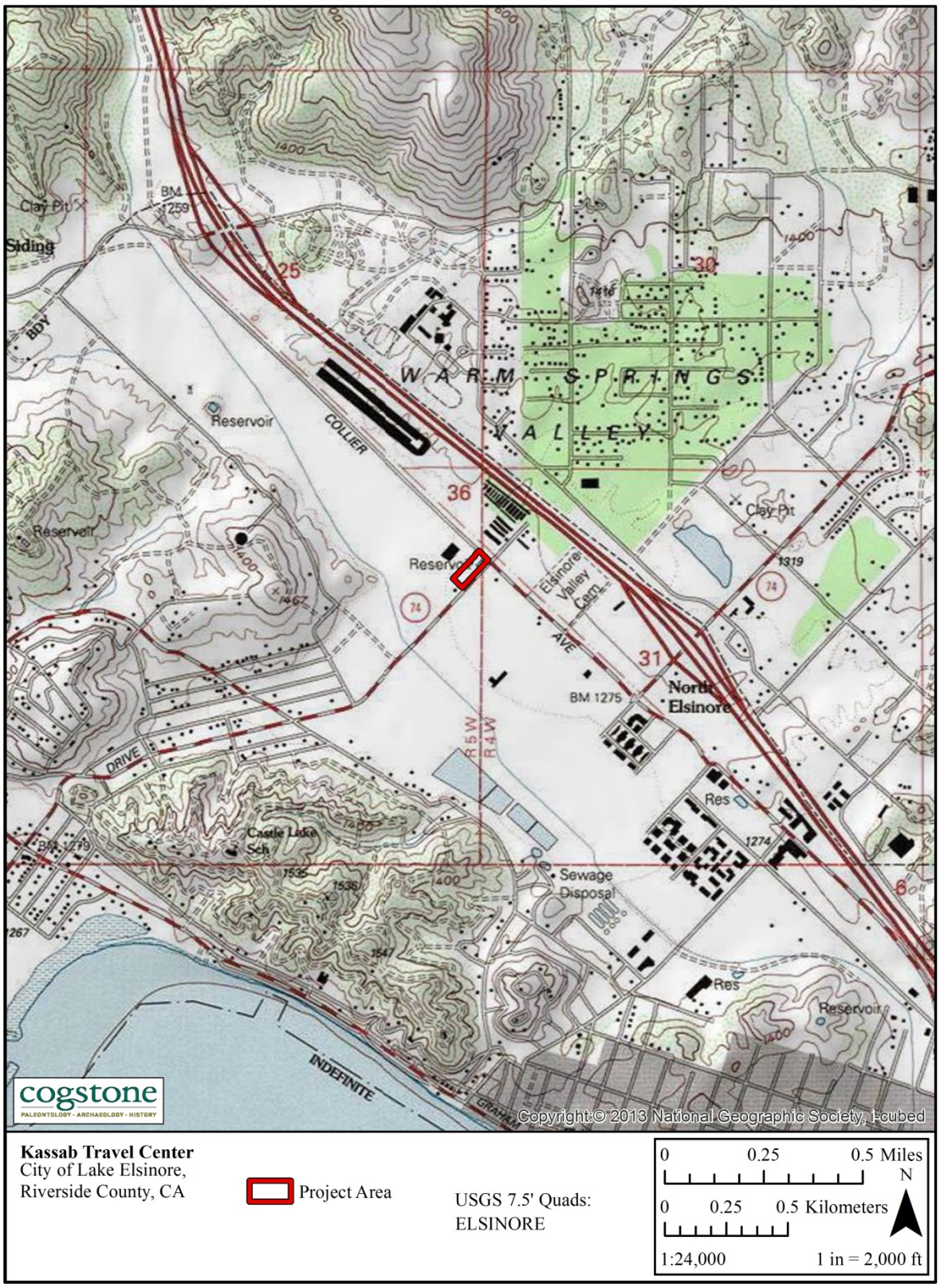

Figure 2. Project Location

REGULATORY SETTING

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA states that: It is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed project and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered.

TRIBAL CULTURAL RESOURCES

As of 2015, CEQA established that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (Pub. Resources Code, § 21084.2). In order to be considered a "tribal cultural resource," a resource must be either:

(1) listed, or determined to be eligible for listing, on the national, state, or local register of historic resources, or

(2) a resource that the lead agency chooses, in its discretion, to treat as a tribal cultural resource.

To help determine whether a project may have such an effect, the lead agency must consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project. If a lead agency determines that a project may cause a substantial adverse change to tribal cultural resources, the lead agency must consider measures to mitigate that impact. Public Resources Code §20184.3 (b)(2) provides examples of mitigation measures that lead agencies may consider to avoid or minimize impacts to tribal cultural resources.

PUBLIC RESOURCES CODE

Section 5097.5: No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands (lands under state, county, city, district or public authority jurisdiction, or the jurisdiction of a public corporation), except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (CRHR) is a listing of all properties considered to be significant historical resources in the state. The California Register includes all properties listed or determined eligible for listing on the National Register, including properties evaluated under Section 106, and State Historical Landmarks number No. 770 and above. The California Register statute specifically provides that historical resources listed, determined eligible for listing on the California Register by the State Historical Resources Commission, or resources that meet the California Register criteria are resources which must be given consideration under CEQA (see above). Other resources, such as resources listed on local registers of historic registers or in local surveys, may be listed if they are determined by the State Historic Resources Commission to be significant in accordance with criteria and procedures to be adopted by the Commission and are nominated; their listing in the California Register, is not automatic.

Resources eligible for listing include buildings, sites, structures, objects, or historic districts that retain historical integrity and are historically significant at the local, state or national level under one or more of the following four criteria:

1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2) It is associated with the lives of persons important to local, California, or national history;
3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a

historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance.

Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

NATIVE AMERICAN HUMAN REMAINS

Sites that may contain human remains important to Native Americans must be identified and treated in a sensitive manner, consistent with state law (i.e., Health and Safety Code §7050.5 and Public Resources Code §5097.98), as reviewed below:

> In the event that human remains are encountered during project development and in accordance with the Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that "No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value."

CITY OF LAKE ELSINORE

The Project must also comply with the Resource Protection and Preservation Chapter of the Lake Elsinore General Plan approved on December 13, 2011 (Lake Elsinore 2011). The goals and policies for cultural resources are outlined in Goal 6 and Goal 7.

> Policy 6.1: Encourage the preservation of significant archaeological, historical, and other cultural resources located within the City.

Policy 6.2: The City shall consult with the appropriate Native American tribes for projects identified under SB 18 (traditional Tribal Cultural Places).

Policy 6.3: When significant cultural/archaeological sites or artifacts are discovered on a site, coordination with professional archaeologists, relevant state and, if applicable, federal agencies, and the appropriate Native American tribes regarding preservation of sites or professional retrieval and preservation of artifacts or by other means of protection, prior to development of the site shall be required. Because ceremonial items and items of cultural patrimony reflect traditional religious beliefs and practices, developers shall waive any and all claims to ownership and agree to return all Native American ceremonial items and items of cultural patrimony that may be found on a project site to the appropriate tribe for treatment. It is understood by all parties that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act.

Policy 6.4: If archaeological excavations are recommended on a project site, the City shall require that all such investigations include Native American consultation, which shall occur prior to project approval.

Policy 7.1: Consult with California Native American tribes prior to decision-making processes for the purpose of preserving cultural places located on land within the City's jurisdiction that may be affected by the proposed plan, in accordance with State or Federal requirements.

Policy 7.2: Continue to identify, document, evaluate, designate, and preserve the cultural resources in the City.

Policy 7.3: Continue to update a citywide inventory of cultural resources in conformance with state standards and procedures while maintaining the confidentiality of information as required by law.

Policy 7.4: Support the permanent curation of archaeological artifact collections by universities or museums or appropriate tribal facilities.

Policy 7.5: Increase opportunities for cultural heritage tourism by promoting the history of Lake Elsinore to attract cultural heritage travelers while maintaining the confidentiality of Native American sites, places, and other information as required by law.

BACKGROUND

ENVIRONMENTAL SETTING

Today's Mediterranean-like climate is characterized by warm, dry summers and cool, moist winters, with rainfall predominantly falling between November and May. Climatic conditions in this region varied substantially during prehistoric times. Because of the unpredictability of long-range weather patterns and events such as El Niño and other broader weather changes, paleoclimatology becomes a crucial issue in understanding prehistoric adaptations in California, leading to research efforts with the goal of reconstructing past environments (Moratto et al. 1978).

Results of such research have identified several climatic trends since the end of the Pleistocene, a period generally accepted today as being much cooler and wetter than currently experienced. These trends can be generally described as sequential periods of cool/moist and hot/dry conditions. At least six periods of cool/moist conditions separated by five episodes of warm/dry conditions have been recorded during the Holocene (Breschini and Haversat 1998).

Research on a finer scale is being conducted to identify mid-term climatic events such as El Niño, along with debate over the significance of these episodes on the prehistoric cultures of the California Bight (Arnold 1992; Raab and Larsen 1997). Changing climatic conditions appear to have dramatically altered resource exploitation patterns, technology and socio-political systems within prehistoric California populations and it is reasonable to assume that such climatic influences affected the prehistoric inhabitants of the study area.

Current land use in the Project vicinity is mainly commercial in character and much of the land surrounding the PA is developed. Lake Elsinore is the largest natural freshwater lake in Southern California and is part of the San Jacinto Basin. Historically the region was used for ranching, agriculture, and mining. The Project vicinity is characterized by natural vegetation communities representative of the Coastal Sage-Scrub Plant Community and includes chaparral, although the PA is currently covered by invasive weeds like Jimson weed and milkweeds. The California sagebrush series, California buckwheat series and bush seepweed series are common shrubs in this region. California annual grasslands, foothill needlegrass series and saltgrass series comprise much of the vegetation in the area, which also includes saltbush, scrub oak, and chaparral.

PREHISTORIC SETTING

The latest cultural revisions for the Project Area (PA) define traits for time phases of the Greven Knoll Pattern of the Encinitas Tradition applicable to inland San Bernardino, Riverside, Los Angeles and Orange counties (Sutton and Gardner 2010). This pattern is subsequently replaced

in the PA by the San Luis Rey Pattern of the Palomar Tradition later in time (Sutton 2011; Table 1).

Greven Knoll sites tend to be in located in the inland valley areas characteristic of the PA. These inland people apparently did not switch from the use of manos and metates to the use of pestles and mortars that is seen in coastal sites dating to approximately 5000 years ago, possibly reflecting their closer relationship with desert cultural peoples who did not exploit acorns. The Greven Knoll toolkit is dominated by manos and metates throughout its 7,500 year extent. In Phase I, other typical characteristics were pinto dart points for atlatls or spears, charmstones, cogged stones, absence of shell artifacts, and flexed position burials (Table 1). In Phase II, Elko dart points for atlatls or spears and core tools are observed along with increased indications of gathering. In Phase III, stone tools including scraper planes, choppers and hammerstones are added to the tool kit, and yucca and plant seeds are staple foods, animals bones are heavily processed (broken and crushed to extract marrow), and burials tend to be marked by stone cairns (Table 1; Sutton and Gardner 2010).

San Luis Rey I sites tended to be located near viable water sources like creeks. Settlement was diffuse and characterized by considerable movement in a series of seasonal settlements along major tributaries. Territories were eventually defined by watersheds of the tributaries. San Luis Rey I reflects the transition from Encinitas technologies including the possible appearance of bedrock metates (slicks), occasional mortars with associated manos and pestles, the appearance of Cottonwood Triangular arrow points, bone awls, and stone ornaments. There was also a decrease in the use of scrapers. The Encinitas forager settlement and subsistence system continued, however, upland resources were increasingly used. The Cottonwood Triangular projectile point is the major technological marker for the San Luis Rey I period. Projectile points were rare in the Encinitas components, so the bow and arrow reflects a major change in technology and subsistence strategies. Pottery and ceramic figurines are conspicuously absent and it is likely that the San Luis Rey I people did not produce rock art, though there are some undated petroglyphs in the area (Sutton 2011).

By the beginning of San Luis Rey II, a system of larger and more sedentary winter and summer villages were established near permanent water. The winter villages would be located in the river valley while summer villages would be located on the mountain. Material culture from San Luis Rey I continued to San Luis Rey II. However, there is a notable appearance of Tizon Brown pottery and small quantities of Lower Colorado Buff Ware, which was imported from the east. Cottonwood Triangular projectile points continued to be used, but had deep concave bases and were much lighter than they were in San Luis Rey I. Euroamerican materials like glass beads and metal knives appeared during San Luis Rey II. There was also an increase in bedrock milling features with mortars, metates, and slicks along with cupule boulders and rock rings. Ceramic figurines and straight ceramic pipes also appeared in San Luis Rey I and continued in San Luis

Ray II. Shell beads became more common and obsidian was generally rare within San Luis Rey II sites. Primary cremation in pits appears to be the main mortuary practice at the end of San Luis Rey I and through San Luis Rey II (Sutton 2011).

Table 1. Cultural Patterns and Phases

Phase	Dates B.P.	Material Culture	Other Traits
Greven Knoll I	8,500 to 5,000	Abundant manos and metates; Pinto dart points for atlatls or spears; charmstones, cogged stones, and discoidals rare; no mortars or pestles; and general absence of shell artifacts.	No shellfish; hunting important; flexed inhumations; and cremations rare.
Greven Knoll II	5,000 to 3,000	Abundant manos and mutates; Elko dart points for atlatls or spears; core tools; late discoidals; few mortars and pestles; and general absence of shell artifacts.	No shellfish; hunting and gathering important; flexed inhumations; and cremations rare.
Greven Knoll III (formerly Sayles complex)	3,000 to 950	Abundant manos and mutates; Elko dart points for atlatls or spears; scraper planes, choppers, and hammerstones; late discoidals; few mortars and pestles; and general absence of shell artifacts.	No shellfish; yucca and seeds as staples; hunting important but animal bones also processed; flexed inhumations beneath rock cairns; and cremations rare.
San Luis Rey I	1,250 to 500	Transition from La Jollan technology, including a decrease in the use of scrapers and increase in the use of mortars and pestles. The appearance of bow and arrow technology including Cottonwood points, bone awls, stone and shell ornaments, and possibly ceramic pipes. Obsidian Butte glass and "recognizable" middens. Pottery and ceramic figurines are absent.	Use of small temporary camps, the establishment of a relatively small number of villages with some focus on coastal resources. Mortuary customs unclear but perhaps some inhumation in early San Luis Rey I with primary pit cremation increasing to be the principal method by late San Luis Rey I.
San Luis Rey II	500 to 150	Addition of Tizon Brown pottery and ceramic figurines and ceramic pipes definitely present. San Luis Rey style of rock art with the addition of Euroamerican material culture like glass beads and metal tools.	Change of settlement pattern to fewer villages closer to Euroamerican settlements; use of other domesticated species from Euroamericans and the apparent adoption of the *Chingichngish* religion. Loss of territory in the interior valleys to Peninsular III groups moving west from the northern Coachella Valley. Primary pit cremation as the principal mortuary practice and no formal cemeteries.

Note: Adapted from Sutton and Gardner 2010 and Sutton 2011

ETHNOGRAPHY

The PA is located within the historical territory of the Luiseño (Kroeber 1925; Figure 3). Luiseño is a language of the Cupan group of the Takic subfamily of Uto-Aztecan. Other Cupan languages were spoken by the Cupeño, Cahuilla, and Gabrieliño. These groups occupied

territories north and east of the Luiseño. The Diegueño (or Ipai), whose territory abutted that of the Luiseño to the south, spoke a Yuman language.

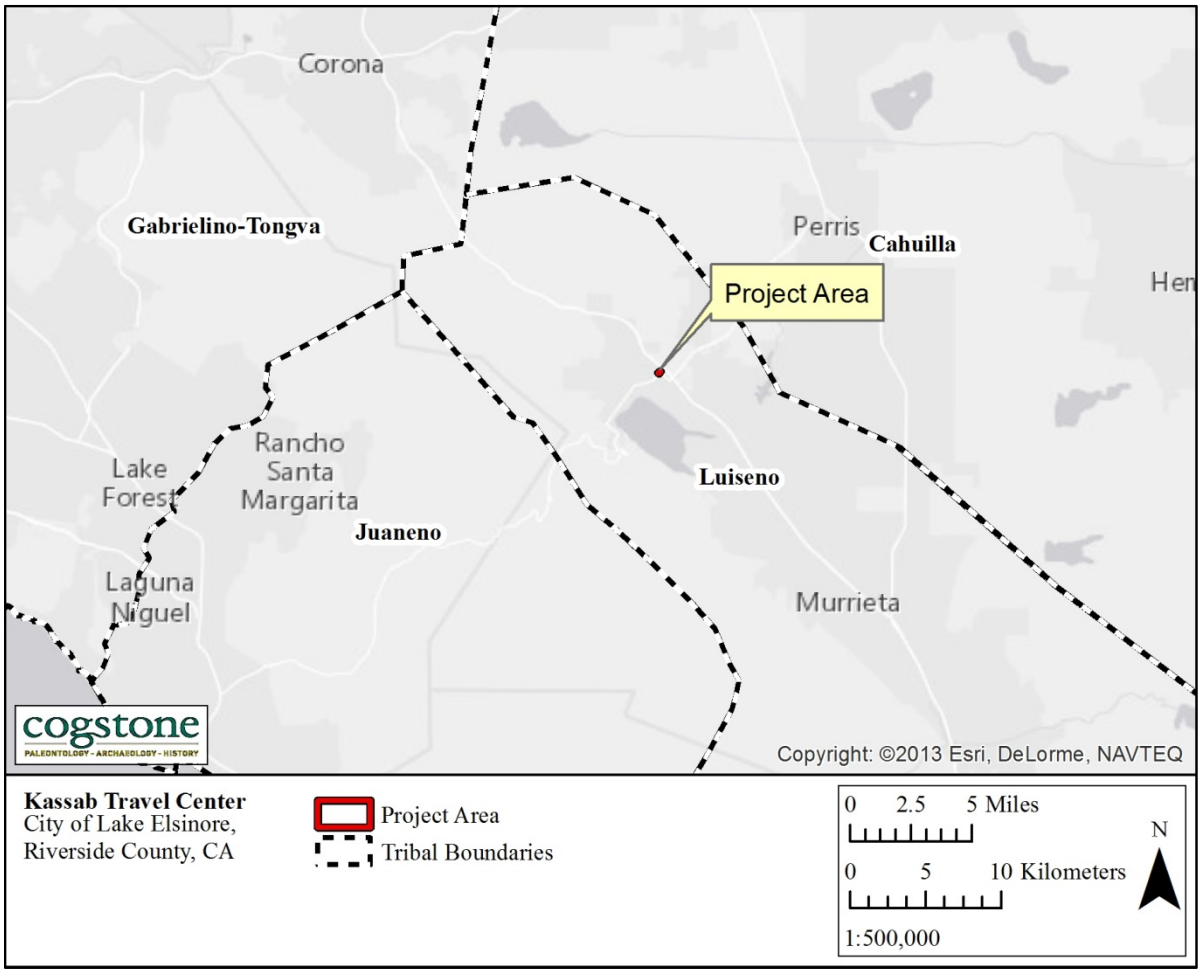

Figure 3. Tribal Boundaries

The integral geographic and sociopolitical unit of the ethnohistoric Luiseño was the rancheria, with included one or more village locations. Luiseño social structure included complex ranks of shamans and secular leaders who guided the rancheria in community social and political tasks and for successful resource exploitation (White 1963:121). More specific details of Luiseño social structure are difficult to reconstruct due to the effects of missionization. It is clear, however, that Luiseño society was patrilineal and exogamous (White 1963). Certain parcels of land containing oak trees and other food resources traditionally used were generally recognized as belong to a specific lineage (Dubois 1908). It is unclear whether Luiseño lineages formed larger kinship units prior to historic contact.

Abundant natural resources along the valley floor sustained semi-permanent villages whose residents claimed additional lands on Palomar Mountain (Gifford 1918). The traditional

settlement pattern consisted of secondary and autonomous village groups, each with specific hunting, collecting, and fishing areas located in diverse ecological zones. Typically these were in valley bottoms, along streams or along coastal strands near mountain ranges (Bean and Shipek 1978:551).

Two or more permanent base camps were used along with number of special purpose camps such as quarry sites, hunting blinds and milling stations (True et al. 1974:78; True and Waugh 1983:109-114). One base camp was the winter village, which was occupied continuously for four to six months annually; this was where most ceremonies took place. Winter villages were generally located in sheltered valleys and often featured pictographs associated with rituals. The other base settlement was the late summer/fall, acorn-gathering and hunting camp, located near oak trees owned by the village group. The entire village lived and worked together in such base camps.

In spring, the winter village group was divided into smaller family groups. These would occupy different areas where fresh vegetables resources were available, or they would go to the coast for shellfish gathering. The spring disaggregation is a normal occurrence in gathering societies. It occurs after winter supplies have been depleted and compensates for the paucity of spring resources. The late summer/fall camps were also subdivisions of the main villages group and were occupied by kin-groups. The major coalescence occurred in the winter villages, after the varied resources were gathered and the subsistence of the village was assured for a period of time.

Several successive ceremonies took place following the death of an individual. After creation of the deceased, the *Tuvish* or ritual washing of clothes was observed as part of a night of singing and dancing. This is followed by the *Chuchamish*, a ritual burning of clothing. The *Tauchanish* was a public ceremony to commemorate the dead of the year, or several years, marked by the display and burning of images of the dead made of rushes, but often hung with valuable clothing and beads (Kroeber 1925:675). If the deceased had been a chief, and *Ashwut marknash* or eagle killing was anniversary ceremony, followed by ritual burial or burning or the eagle's body (Kroeber 1925:767-677).

With respect to precontact Luiseño population estimates, Kroeber (1925:649) opined that 3,000 was a low figure and 4,000 a liberally-allowed maximum. In 1856 the Indian Office reported over 2,500; in 1870, 1,300; in 1885, 1,150. Tribal discrimination is likely to have been inaccurate. Today there are less than 500, according to the Federal census.

Although the use of objects fashioned from wood, pelts, feathers, and fiber were reported for the Luiseño, these are unlikely to survive in the archaeological record and thus probably would not be part of an assemblage from a prehistoric site. Archaeologically, objects such as ceramic pot

sherds, grooved, stone arrow shaft straighteners, deer antler flaking tools, pestles, manos, permanent and portable mortars and metates, gaming stones, beads and various other stone tools and associated debitage have been found at many sites (Sparkman 1908:206, 210-211; Bean and Shipek 1978).

HISTORIC SETTING

Spanish Franciscan father Juan Santiago was the first European to document Lake Elsinore during his exploration east from the Mission San Juan Capistrano in 1797. The *Laguna Grande* was described as being little more than a swamp about a mile long in 1810, but the lake grew larger and by the early 19th century it became a spot to camp and water animals for Mexican rancheros, American trappers, explorers, and immigrants during the California Gold Rush. (City of Lake Elsinore 2017)

Julian Manriquez acquired the land grant for Rancho La Laguna on January 7, 1844, which included the lake. In 1851 Abel Stearns acquired the rancho and sold it to Augustin Machado in 1858 (see Table 5). Rancho La Laguna was a regular stop on the Butterfield Overland Mail route between Temecula and Temescal. After a flooding event in 1862, the Union Army created a post at the lake to graze and water their horses. A drought occurred shortly after between 1862 and 1865, and most of the cattle died and the lake dried out. Despite this, the Machado family continued to own La Laguna Rancho until 1873, when the majority of the rancho was sold to Charles A. Sumner. (City of Lake Elsinore 2017)

In 1883 Franklin H. Heald and his partners Donald Graham and William Collier bought the remaining rancho in order to start a new town. In 1884 the California Southern Railroad built a line from Colton to link to San Diego, and the La Laguna rail station was built within the present day City of Lake Elsinore. On April 20, 1888 Lake Elsinore was incorporated and was originally in San Diego County until the creation of Riverside County in 1893. In 1888 the economy was supported by coal, clay, and gold mining as well as ranching and the agriculture of fruit and nuts. (City of Lake Elsinore 2017)

In the early 1900s the City was popular with celebrities and many of their homes still exist in the City surrounding the lake. During World War II, the lake was used to test seaplanes and a Douglas Aircraft plant making wing assemblies for Boeing B-17 Flying Fortress bombers was established. The lake dried out and was refilled several times during the 20th century, but eventually a project was implemented to maintain the water supply at a consistent level after massive flooding in 1980. The City of Lake Elsinore continues to be one of California's fastest growing cities, having grown from a small lakeside town with a population of 3,800 people in 1976 to a community of 51,821 people in 2010. (City of Lake Elsinore 2017)

PROJECT AREA HISTORY

The 1901 USGS Elsinore 1:250,000 topographic map shows the Southern California Railroad running along Collier Avenue. There are two recorded structures near the PA intersection of Collier Avenue and Riverside Drive in an area named "North Elsinore." The 1953 USGS Elsinore 7.5' topographic map shows the former Southern California Railroad as the Atchison, Topeka and Santa Fe Railroad (ATSF). The two structures documented in 1901 remain and are located directly to the south of the PA. An unnamed reservoir is located within the PA at the southwest quadrant of the Collier Avenue and Riverside Drive intersection. Both the two structures and the Reservoir are present in the 1997 USGS 7.5' Lake Elsinore topographic map. The earliest historic aerials for the PA date to 1967 and show the former reservoir within the PA in the southwest quadrant of the Collier Avenue and Riverside Drive intersection. A complex of structures, obscured by trees is located to the south of the PA. Both the Reservoir and complex of buildings are present in the 1980 aerial. In 1994, the complex of building to the south of the PA and the Reservoir are no longer visible.

SOURCES CONSULTED

CALIFORNIA HISTORIC RESOURCES INVENTORY SYSTEM

Megan Wilson, a Cogstone Archaeologist, performed a search for archaeological and historical records on May 24, 2017 at the Eastern Information Center (EIC) of the California Historical Resources Inventory System (CHRIS) located at the University of Riverside. The record search covered a one-mile radius around the PA.

The results of the records search indicated that no prior studies have been completed within the boundaries of the PA, while 31 studies have been completed previously within a one-mile radius of the PA (Table 2). The previous studies within the one-mile radius of the PA included seven conducted within a 0-0.25 mile radius of the PA, eight conducted within a 0.25-0.5 mile radius, and 16 conducted within a 0.5-1 mile radius of the PA.

Table 2. Previous Studies Within a One-Mile Radius of the Project Area

Report No.	Author(s)	Title	Year	Distance from PA
RI-00093	Marsh, Amanda F.	Glen Valley Pipeline Woodcrest, Riverside County, Expected Impact on Archaeological Resources	1973	0-0.25
RI-00786	Davis, Emma Lou and Jacqueline Nichols	Outline Draft of Evaluation of Early Human Activities and Remains in the California Desert	1979	0-0.25

Report No.	Author(s)	Title	Year	Distance from PA
RI-01013	Hammond, Stephen	Cultural Resources Survey of Two Materials Sources, Murrieta Creek and the Joe Deleo, Jr. Property, Riverside County, California	1978	0.5-1
RI-01718	Bouscaren, Stephen	An Archaeological Assessment of 44 Acres of Land North Of Lake Elsinore, Riverside County, California	1983	0.5-1
RI-01793	Lerch, Michael K. and G.A. Smith	Cultural Resources Assessment of the Proposed Lake Elsinore Management Project, Riverside County, California	1984	0.25-0.5
RI-01888	Salpas, Jean	An Archaeological Assessment of Proposed Class II Sanitary Landfill Site No. 11, Riverside County, California	1984	0.5-1
RI-02027	Brock, James	Archaeological Assessment of the Eda Grant Project Areas, City of Lake Elsinore	1986	0.25-0.5
RI-02351	Drover, C.E.	An Archaeological Assessment of the Biddle Property Feasibility Study Temescal Canyon, Riverside County, California	1987	0.5-1
RI-02627	Brown, Joan C.	Cultural Resources Reconnaissance for the Pacific West Outlet Center, Lake Elsinore, Riverside County, California.	1989	0.5-1
RI-02629	Sturm, Bradley L.	Archaeological Investigations at Ca-Riv-4110 And Ca-Riv-3858, Lake Elsinore, California.	1992	0.25-0.5
RI-03282	Drover, Christopher E.	A Cultural Resource Assessment: SKR Habitat Fence Project, Lake Skinner, Riverside County, California	1991	0.5-1
RI-03311	Evans, Stuart A.	Cultural Resources Reconnaissance of Project Number 533-0769-78, 27 Acres in Elsinore, Riverside County, California	1990	0.25-0.5
RI-03723	Kice, David and Nancy Desautels	Cultural Resources Assessment of the Collier Avenue Improvement Project Area, Riverside County, California	1993	0.5-1
RI-03876	Whitney-Desautels, Nancy A. and Robert M. Beer	Archaeological Survey and Inventory Report, North Peak Project.	1999	0-0.25
RI-04007	Allen, Kathleen C.	Archaeological Assessment Of L.A. Cellular Site #669.3, Abandoned Reservoir Site On Sunny Slope Avenue, City of Lake Elsinore, Riverside County, California	1996	0.5-1
RI-04008	Duke, Curt	Letter Report: Cultural Resource Assessment for AT&T Wireless Services Facility Number C6693, County of Riverside, California.	1999	0.5-1
RI-04144	Love, Bruce And Bai "Tom" Tang	Cultural Resources Report: Temescal Valley Regional Interceptor, Santa Ana Watershed Project Authority, Riverside County, California	1998	0-0.25
RI-04201	Dillon, Brian D Ph.D.	Cultural Resources Assessment, City of Lake Elsinore Wastewater Treatment Plant Expansion Project, Riverside County, California.	1999	0.5-1

Report No.	Author(s)	Title	Year	Distance from PA
RI-04421	LSA Associates, Inc.	Appendix B-Cultural Resources. In: Measure A Program Project Alternatives Analysis-Environmental Component, Technical Appendix Volume I	1990	0.5-1
RI-04463	Macko, Michael E.	Archaeological Survey Report of Amcor Properties, Inc. 600-Acre French Valley Specific Land Use Plan, Riverside County, California	1989	0.5-1
RI-04725	Mclean, Deborah	Letter Report: Cultural Resource Assessment of the Lake Elsinore Forest Fire Station Relocation in the City of Lake Elsinore, Riverside County, California	2000	0.25-0.5
RI-04815	York, Andrew And Jane E. Wooley	Cultural Resources Evaluation of Oak Valley, Riverside County, California	1987	0.25-0.5
RI-05321	Goodwin, Riordan	Cultural Resource Assessment, Central Avenue Parcels (APN's 377-120-007 and -008) City of Lake Elsinore, Riverside County, California	2004	0.25-0.5
RI-05324	Mclean, Deborah	First Supplemental Historic Property Survey Report- Negative Findings	2002	0.5-1
RI-05529	Tejada, Barbara	Historical Resources Compliance Report (District 8, Riverside County, Route 74, K.P. 23.9/R24.4. P.M.14.82/R15.16)	2005	0.5-1
RI-06888	Lerch, Michael K. And Gray, Marlesa A.	Cultural Resources Assessment of the Valley-Ivyglen Transmission Line Project, Riverside County, California	2006	0-0.25
RI-06987	Glenn, Brian K.	Letter Report: Due Diligence Cultural Resources Assessment Letter Report for Approximately 4.27-Acre Central and Dexter Project Area, City of Lake Ellsinore, County of Riverside, California	2006	0.5-1
RI-07342	Iverson, Dave	Letter Report: Cultural Resources Study for the Caliber Commercial Project (Crossroads), City of Lake Elsinore, Riverside County, California	2007	0.5-1
RI-08679	Jay K. Sander	Archaeological Survey Report for Southern California Edison's Pole Replacement Project	2010	0.25-0.5
RI-09105	Anonymous	Tractor Supply Co. Project (Commercial Design Review No. 2014-01& Conditional Use Permit No. 2014-01) Initial Study for Mitigated Negative Declaration No. 2014-01	2014	0-0.25
RI-09377	Roberta Thomas	Cultural Resource Monitoring Report for the Arroyo del Toro Channel Project, Lake Elsinore, Riverside County, California	2014	0-0.25

The records indicated that no previously recorded cultural resources are located within the boundaries of the PA. A total of fifteen cultural resources have been previously documented outside of the PA but within the one-mile radius of the PA (Table 3). These consist of one prehistoric archeological site, three prehistoric archaeological isolates, six historic archaeological

sites, two historic archaeological isolates and three historic built environment resources. Of these, six are located within 0-0.25 mile radius of the PA, three are recorded within 0.25-0.5 mile radius of the PA, and six are recorded within a 0.5-1 mile radius of the PA.

Table 3. Previously Recorded Resources Within a One-Mile Radius of the Project Area

Primary No.	Trinomial	Resource Type	Description	Year Recorded	Distance from PA
P-33-003832	CA-RIV-003832	Historic Resource	Railroad: Atchison Topeka and Santa Fe Railroad, Santa Fe Railroad grade through the Temescal Valley	1990, 1990, 1996, 2001, 2005 , 2006, 2011	0.5-1
P-33-013802	-	Prehistoric Isolate	Unifacial mano	2004	0.5-1
P-33-013803	-	Prehistoric Isolate	Unifacial mano	2004	0.5-1
P-33-015364	CA-RIV-008120	Historic archaeological site	Historic trash scatter	2006	0.5-1
P-33-015420	CA-RIV-008132	Historic Resource	Cemetery: The Elsinore Valley Cemetery and Home of Peace Jewish Cemetery	2006, 2007	0-0.25
P-33-015793	-	Prehistoric isolate	Bifacial mano	2007	0-0.25
P-33-015794	CA-RIV-008226	Historic archaeological site	Foundations/structure pads and historic trash scatter	2007	0-0.25
P-33-016218	CA-RIV-008367	Historic archaeological site	Historic trees and trash scatter	2007	0-0.25
P-33-016641		Prehistoric archaeological site	Bedrock milling features	2007	0-0.25
P-33-017019		Historic resource	Multiple family property, vernacular bungalow: 1959	2008	0-0.25
P-33-017020	CA-RIV-008861	Historic archaeological site	Historic can scatter	2007	0.25-0.5
P-33-017022	CA-RIV-008862	Historic archaeological site	Foundations/structure pads	2008	0.25-0.5
P-33-017026	CA-RIV-008865	Historic archaeological site	Foundations/structure pads	2007	0.25-0.5
P-33-024666	-	Historic isolate	Body fragment of a "Gordon's London Dry Gin" bottle	2015	0.5-1
P-33-024667	-	Historic isolate	Neck fragment of glass beverage bottle	2015	0.5-1

OTHER SOURCES

In addition to the records at the EIC, a variety of sources were consulted by Megan Wilson in May 2017 to obtain information regarding the PA (Table 4). Sources include the National

Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), California Historical Resources Inventory (CHRI), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI) and local historical registers. Specific information about the PA, obtained from historic maps, is presented in the Project Area History section.

Table 4. Additional Sources Consulted

Source	Results
National Register of Historic Places (NRHP; 1979-2002 & supplements)	Negative
Historic USGS Topographic Maps	The 1901 Elsinore 1:250,000 topographic map shows the Southern California Railroad running along Collier Avenue. There are two recorded structure near the PA intersection of Collier Ave and Riverside Dr. in an area named "North Elsinore". The 1953 Elsinore 7.5' topographic map show the former Southern California Railroad as the ATSF Railroad. The two structures documented in 1901 remain and are located directly to the south of the PA. A Reservoir is located in the PA at the southwest quadrant of the Collier Ave. and Riverside Dr. intersection. Both the two structures and the Reservoir are present in the 1997 7.5' Lake Elsinore topographic map.
Historic US Department of Agriculture Aerial Photographs	The earliest historic aerials for the PA date to 1967 and show a former reservoir within the PA in the southwest quadrant of the Collier Ave. and Riverside Dr. intersection. A complex of structures, obscured by trees is located to the south of the PA. Both the reservoir and complex of buildings are present in the 1980 aerial. In 1994, the complex of building to the south of the PA and the reservoir appear to be razed.
California Register of Historical Resources (CRHR; 1992-2014)	Negative
California Historical Resources Inventory (CHRI; 1976-2014)	Negative
California Historical Landmarks (CHL; 1995 & supplements to 2014)	Negative
California Points of Historical Interest (CPHI; 1992 to 2014)	Negative
Caltrans Historic Bridge Inventory (Caltrans 2016)	Negative
Bureau of Land Management (BLM) General Land Office Records	Positive, see Table 5

Table 5. Land Patents

Name(s)	Year	Authority	T; R; Section
Southern Pacific Railroad	1885, 1896	Atlantic-Pacific Railroad Grant	T: 5S; R: 4W, Section 31
Able Stearns	1872	Spanish/Mexican Land Grant	T: 5S; R: 4W, Section 31 and :5S; R: 5W, Section 36
USA	1973, 1875	N/A	T:5S; R: 5W, Section 36

SACRED LANDS FILE SEARCH

On June 6, 2017 a Sacred Lands File search was requested from the Native American Heritage Commission (NAHC). The NAHC responded on June 7, 2017 that the Sacred Lands File search was negative for resources within the PA (Appendix B).

NATIVE AMERICAN CONSULTATION

The City of Lake Elsinore is conducting Native American Consultations to meet their requirements under Assembly Bill 52 (AB52). Cogstone, on behalf of the City, drafted and sent the letters to the tribes on December 20, 2017. Three responses were received within the 30 day time period (Appendix C).

On January 8, 2018 Tuba Ebru Ozdil, on behalf of the Pechanga Band of Luiseño Mission Indians, responded via letter that the Project lies within a sensitive area for the Tribe and that there were numerous recorded cultural resources within a one-mile radius of the Project. She stated that there were also several place names, known village locations, and recorded Traditional Cultural Places (TCPs) within the vicinity. For these reasons, the Pechanga believes that the possibility for encountering resources during excavation for the Project is high. Pechanga requested government-to-government consultation with the City and to be included in all correspondence regarding this Project.

On January 18, 2018 Joseph Ontiveros, on behalf of the Soboba Band of Luiseño Indians, responded to the City via letter that the tribe requested to initiate formal consultation with the City and could be contacted to schedule a meeting.

On January 18, 2018 Katie Croft, on behalf of the Agua Caliente Band of Cahuilla Indians, responded via e-mail that the Project was not located within the Tribe's Traditional Use Area and deferred consultation to the other tribes in the area.

As of February 20, 2018, the City of Lake Elsinore is still in consultation with the tribes.

SURVEY

METHODS

The survey stage is important in a project's environmental assessment phase to verify the exact location of each identified cultural resource, the condition or integrity of the resource, and the proximity of the resource to areas of cultural resources sensitivity. All undeveloped ground surface areas within PA were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools or fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic-era debris (e.g., metal, glass, ceramics). Existing ground disturbances (e.g., cutbanks, ditches, animal burrows, etc.) were visually inspected. Photographs of the PA, including ground surface visibility and items of interest, were taken with a digital camera.

RESULTS

An intensive pedestrian survey was conducted by Megan Wilson of the entire 2.39 acre PA on May 24, 2017. Ground visibility was limited (30 percent) due to tall, dense, invasive weeds throughout the PA (Figures 3 & 4). The PA was flat with silty sands. In addition, concrete chunks and decomposed asphalt were scattered throughout the PA (Figure 5). The PA is disturbed in the south by homeless camps that were vacant at the time the survey was conducted. No cultural resources were observed during the survey.

Although the visibility within the PA is low, the aerials from 1967 show that the area was completely developed with a reservoir within the PA with associated buildings to the south of the PA. The reservoir and buildings were still present in 1980, but are absent in the 1994 aerial. The concrete and asphalt chunks observed within the PA during the survey are likely associated with the now-demolished reservoir and buildings. For this reason, it is unlikely that there will be any impact to cultural resources within the PA as the area has been previously developed and is highly disturbed.

Figure 4. View of PA from Riverside Drive, View North

Figure 5. View from Center of PA Toward Collier, View North

Figure 6. Example of Concrete Chunks Located Within PA, Plan View

CONCLUSIONS AND RECOMMENDATIONS

Identification efforts by Cogstone for this cultural resources assessment included a review of existing literature and historic maps, a record search conducted at the EIC, and an intensive pedestrian survey. No cultural resources have been previously recorded or were observed within the PA during the pedestrian survey.

The City of Lake Elsinore is conducting Native American Consultations to meet their requirements under Assembly Bill 52 (AB52). Cogstone, on behalf of the City, drafted and sent the letters to the tribes on December 20, 2017. Three responses were received within the 30 day time period. As of February 20, 2018, the City of Lake Elsinore is still in consultation with the tribes.

The shallow depth of excavation and the lack of archaeological sites in the Project vicinity and the disturbance of the PA due to previous development (reservoir) indicate that the potential for discovery of intact archaeological deposits, including unknown buried archaeological deposits, materials, or features, by the implementation of this Project is low. No further cultural resources work is necessary. No further cultural resources work is necessary.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist evaluates it. In the unlikely event that human remains are encountered during Project development, all work must cease near the find immediately.

In accordance with California Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods. Work may not resume in the vicinity of the find until all requirements of the health and safety code have been met.

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City of Lake Elsinore

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APPENDIX A. QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

HOLLY DUKE
Task Manager/Archaeologist

EDUCATION

2009 B.A., Archaeology/History, Simon Fraser University, Canada

SUMMARY QUALIFICATIONS

Ms. Duke is a qualified archaeologist and cross-trained paleontologist with over four and a half years of experience in survey, monitoring, excavation, and the identification of human and faunal skeletal remains. She is Cogstone's Lab and Data Manager. Her laboratory responsibilities include: identification and analysis of human skeletal remains; cleaning and identification of faunal bones for inclusion in faunal collections; measuring and cataloging prehistoric and historic artifacts; washing, sorting, and identifying seeds; as well as fossil preparation and stabilization. As Data Manager, she is responsible for the organization of field data, lab supervision and organization, and maintaining the iPads used for data collection in the field.

Crowder Canyon, Caltrans District 8, San Bernardino County, CA. The project consisted of the realignment of SR-138. Participated in the archaeological testing and data recovery of two archaeological sites near Hesperia. Conducted excavation and data recovery of more than six prehistoric features. Sub to Applied Earthworks. Archaeologist. 2016

Longboat Solar Photovoltaic, EDF Renewable Energy, Cities of Barstow and Lenwood, San Bernardino County, CA. The project involved construction of a solar energy facility within an approximately 234 acre property. Cogstone conducted cultural resources Phase I and Extended Phase I studies. Tasks included archaeological and paleontological resources records search, Sacred Lands search, Native American consultation. Identified and cataloged all artifacts recovered, delivered artifacts to tribes for repatriation. Sub to Environmental Intelligence. Archaeologist/Lab and Data Manager. 2015-present

Fisher House and Golf Course Parking Lot Project, Veterans Affairs Long Beach Healthcare System, City of Long Beach, Los Angeles County, CA. In compliance with the Historic Properties Treatment Plan, supported an archaeological testing program to identify cultural resources by utilizing ground penetrating radar and magnetometry, shovel test pits, and mechanical excavation. Recovered numerous historic artifacts from a trash dump during ground disturbing activities within the Golf Course Parking Lot project area. Cleaned, identified, and cataloged all recovered artifacts. Monitored excavation for utilities at Golf Course Parking Lot project. Prime. Archaeologist/Lab and Data Manager. 2015-2016

Del Sur Solar EIR, City of Lancaster, Lancaster, CA. The project consisted of the construction of a 100 MW solar facility on ~725 acres and a 2-4 mile gen-tie line to SCE's Antelope Substation. Tasks included a cultural resources assessment on behalf of the City of Lancaster. Participated in the field survey, recorded sites on DPR series 523 forms, drafted sections of technical report for inclusion in the cultural resources section of the EIR document. Sub to Aspen. Archaeologist/ Lab and Data Manager. 2015

Bodie Hills FY14-15 Cultural Resources Survey, Desert Restoration Project, Bureau of Land Management, Bishop Field Office, Mono County, CA. The project consisted of a Class III Cultural Resources Inventory survey of 2,721 acres of BLM land identified for vegetation management. Conducted intensive pedestrian survey, organized and maintained data collected in the field, and prepared site records for final report. Prime. Archaeologist/Lab and Data Manager. 2014-2015

Metropole Vault Replacements, Southern California Edison, Avalon, Catalina Island, Los Angeles County, CA. Participated in archaeological monitoring and data recovery excavations. Responsible for collections management of all artifacts and remains during excavation. Created spreadsheet databases to manage artifacts and features. Identified, cleaned, and recorded human remains per the MLD's instructions. Assisted with repatriation of human remains prior to construction completion. Managed and organized field photos and feature data after construction was complete. Prime. Archaeologist/Osteologist /Lab and Data Manager. 2014

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

MOLLY VALASIK
Principal Archaeologist II

EDUCATION

2009 M.A., Anthropology, Kent State University, Kent, Ohio
2006 B.A., Anthropology, Ohio State University, Columbus, Ohio

EXPERIENCE

Ms. Valasik is a Registered Professional Archaeologist with eight years of professional experience. She is a skilled professional who is well-versed in the compliance procedures of CEQA and Section 106 of the NHPA and regularly prepares cultural resources assessment reports for a variety of federal, state, and local agencies throughout California. She has managed local assistance projects involving sidewalk, road, interchange, and bridge improvements with Caltrans/FHWA as the lead agency. In addition, she has prepared cultural resources reports for CEQA/EIR compliance documents for project-level and program-level Specific Plans, General Plans, Master Plans, and Zoning Amendments for mixed-use, residential, commercial and industrial developments. She meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*

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SELECTED PROJECTS

Old Town Streetscape, Phase 2, Caltrans District 3, City of Elk Grove, Sacramento County, CA. The City proposed construction of bump outs, sidewalk widening, bus lanes, etc. within a National Register-listed historic district. Managed cultural studies including record search, Sacred Lands File search, Native American consultation, intensive-level pedestrian archaeological and architectural surveys, as well as coordination and approval by District 3 of an APE map. The District record was updated. Author of Archaeological Survey Report and Historic Properties Survey Report. Sub to Michael Baker/PMC. Project Manager/Principal Investigator. 2016

SR-138 Palmdale Boulevard PA/ED (Sierra Highway), Caltrans District 7, City of Palmdale, Los Angeles County, CA. The project involved widening State Route 138 and Sierra Highway. Managed cultural studies including record search, Sacred Lands File search, Native American consultations, and intensive-level pedestrian archaeological survey, as well as coordinated approval by District 7 of an APE map. Co-author of the Archaeological Survey Report and Historic Properties Survey Report. Sub to Parsons Transportation. Project Manager/Principal Investigator. 2016

Paradise Valley Specific Plan, County of San Bernardino, near Indio, CA. The proposed project, encompassing 5,411 acres, consists of the construction of a planned community. Directed archaeological survey and extended Phase I activities. Lead author of assessment report. Managed subsequent supplemental survey and updated report. Sub to Envicom. Field Director and GIS Manager. 2011-2013; 2014; 2016

Arlington Avenue Widening, Caltrans District 8, City of Riverside Public Works, Riverside County, CA. The City proposed widening Arlington Avenue one linear mile in order to construct safety improvements. Managed cultural studies including record search, Sacred Lands File search, Native American consultations, and intensive-level pedestrian archaeological survey of the 5-acre site with negative results, as well as coordinated approval by District 8 of an APE map. Co-author of the Archaeological Survey Report and Historic Properties Survey Report. Sub to Michael Baker. Project Manager/Co-Principal Investigator. 2015

Folsom Boulevard Streetscape Enhancement, Caltrans District 3, City of Rancho Cordova, Sacramento County, CA. The City proposed to construct sidewalks, bike lanes, medians, safety fencing, and street and pedestrian lighting along Folsom Boulevard. Managed cultural studies including record search, Sacred Lands File search, Native American consultations, and intensive-level pedestrian archaeological survey, as well as coordination and approval by District 3 of an APE map. Author of Archaeological Survey Report and Historic Properties Survey Report. Sub to Michael Baker/PMC. Project Manager/Principal Archaeologist. 2015

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

MEGAN WILSON

Archaeologist/GIS Specialist

EDUCATION

2014 M.A. Anthropology, California State University, Fullerton *cum laude*
2013 GIS Certificate, California State University, Fullerton
2006 B.A., Anthropology, University of California, Los Angeles *cum laude*

SUMMARY QUALIFICATIONS

Ms. Wilson is a Registered Professional Archaeologist (RPA) and cross-trained paleontologist with experience in survey, excavation, laboratory preparation/curation analysis, historic archaeology and historic architecture. Ms. Wilson regularly conducts records searches, tribal consultations, completes DPR site records, and gathers historic building information from local municipalities, and assists in drafting archaeological assessment reports for state, federal, and private development projects. She meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. She is GIS proficient and assists with the digitizing and mapping of spatial data for all projects as well as analyzing historic maps. Ms. Wilson has six years of experience in southern California archaeology.

SELECTED PROJECTS

Paradise Valley Specific Plan, Glorious Land Company, unincorporated Riverside County, CA. The project involves construction of a master-planned community. Of the 5, 000-acre project area, 1,800 acres are slated for development, leaving the remaining 3,200 acres as open space. Coordination with the BLM was required regarding off-site power and fiber optic lines situated on federal lands. Conducted records search and archive research. Cogstone also conducted NAHC consultation, archaeological and paleontological resources survey and APE mapping for inclusion in the Supplemental Phase I Cultural Resources Assessment Report.

High Desert Corridor/ SR 138 Widening Project, FHWA/Caltrans District 7, Los Angeles and San Bernardino Counties, CA. The project involves construction of a new, approximately 63-mile long, east-west freeway/expressway between SR 14 in Los Angeles County and SR 18 in San Bernardino County. Field pedestrian survey for Extended Phase I (XPI) Testing, subsurface testing of four archaeological sites in the Area of Potential Effects (APE), and lab work. Caltrans is the lead federal and state agency; compliance with Section 106 and CEQA required. Tasks included paleontological records, GIS maps, and organizing artifacts. Sub to Parsons Transportation Group. Archaeology Technician. 2014-2015

Dune Palms Bridge, Project Design and Environmental Documents, La Quinta, Riverside County, CA. The project involved replacing a low water crossing spanning the Coachella Valley Storm Water Channel at Dune Palms Road. Conducted record search, sacred lands search, and NAHC consultation. Cogstone also conducted an intensive field survey, APE mapping, and prepared a Historic Properties Survey Report (HPSR) with appended Archaeological Survey Report (ASR) to support the PA&ED/PSR/PS&E documents. In addition, the project is located within known boundaries of prehistoric Lake Cahuilla, which has previously produced significant fossils. Cogstone conducted a paleontological sensitivity analysis and prepared a Paleontological Identification Report (PIR). Sub to Parsons Brinckerhoff. Archaeologist. 2014

I-10 Grove Avenue Interchange, Ontario, San Bernardino County, CA. Archaeological and paleontological records search, historic map search, and NAHC consultation to support preparation of PIR/PER, PMP, HPSR/ASR, and HRER documents. Sub to Parsons Transportation Group. Archaeologist. 2015

Fogarty Substation, Southern California Edison, Lake Elsinore, Riverside County, CA. Prepared maps and graphics for inclusion in a cultural resources monitoring compliance report documenting activities associated with the construction of a water pipeline. Sub to SWCA. GIS Specialist. 2016

APPENDIX B. SACRED LANDS FILE SEARCH RESULTS

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION

Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

June 7, 2017

Megan Wilson
Cogstone

Sent by E-mail: mwilson@cogstone.com

RE: Proposed Kassab Travel Center Project, City of Lake Elsinore; Elsinore USGS Quadrangle, Riverside County, California`

Dear Ms. Wilson:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. Please note that the intent of the reference codes below is to avoid or mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects under AB-52.

As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 **require public agencies** to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

> **Within 14 days** of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.3.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.
   - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and
   - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A search of the SFL was completed for the project with negative results.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

APPENDIX C. NATIVE AMERICAN AB52 CONSULTATION

PECHANGA CULTURAL RESOURCES
Temecula Band of Luiseño Mission Indians

Post Office. Box 2183 • Temecula, CA 92593
Telephone (951) 770-6300 • Fax (951) 506-9491

Chairperson:
Neal Ibanez

Vice Chairperson:
Bridgett Barcello

Committee Members:
Andrew Masiel, Sr.
Darlene Miranda
Evie Gerber
Richard B. Scearce, III
Robert Villalobos

Director:
Gary DuBois

Coordinator:
Paul Macarro

Planning Specialist:
Tuba Ebru Ozdil

January 8, 2018

VIA E-Mail and USPS

Megan Wilson, Archaeologist
Cogstone Archaeology
1518 West Taft Avenue
Orange, CA 92865

RE: Request for Information for the Kassab Travel Center Project located in the City of Lake Elsinore [APNs 378-030-007 and 378-030-009]

Dear Ms. Wilson;

The Pechanga Band of Luiseño Indians ("the Tribe") appreciates your request for information regarding the above referenced Project. After reviewing the provided maps and our internal documents, we have determined that the Project area is not within reservation lands although it is within our ancestral territory.

At this time, we are interested in participating in this Project based upon traditional knowledge of the area. The proposed Project lies within a sensitive area for the Tribe, and there are numerous recorded cultural resources within one mile radius of the project site. In addition, there are several place names, known village locations, and recorded TCPs within close vicinity of the project location. For these reasons, the Tribe believes that the possibility for recovering subsurface resources during any ground-disturbing activities for the Project is high.

The Tribe is dedicated to providing comprehensive cultural information to you and your firm for inclusion in the archaeological study as well as to the Lead Agency for CEQA review. At this time, the Tribe requests the following so we may continue the consultation process and to provide adequate and appropriate recommendations for the Project:

1) Notification once the Project begins the entitlement process, if it has not already;
2) Copies of all applicable archaeological reports, site records, proposed grading plans and environmental documents (EA/IS/MND/EIR, etc.);
3) Government-to-government consultation with the Lead Agency; and
4) The Tribe believes that monitoring by a Riverside County qualified archaeologist and a professional Pechanga Tribe monitor may be required during earthmoving activities. Therefore, the Tribe reserves its right to make additional comments and recommendations once the environmental documents have been received and fully reviewed. Further, in the event that subsurface cultural resources are identified, the

Tribe requests consultation with the Project proponent and Lead Agency regarding the treatment and disposition of all artifacts.

As a sovereign government, the Tribe is entitled to appropriate and adequate government-to-government consultation regarding the proposed Project. For the record, the Tribe does not consider initial inquiry letters from project consultants to constitute appropriate government-to-government consultation, but rather tools to obtain further information about the Project area. Therefore, the Tribe reserves its right to participate in the formal environmental review process, including government-to-government consultation with the Lead Agency, and requests to be included in all correspondence regarding this Project.

Please note that we are interested in participating in surveys within Luiseño ancestral territory. Prior to conducting any surveys, please contact the Pechanga Cultural Resources Department. If you have any additional questions or comments, please contact me at eozdil@pechanga-nsn.gov or 951-770-6313.

Sincerely,

Tuba Ebru Ozdil
Planning Specialist

Pechanga Cultural Resources • Temecula Band of Luiseño Mission Indians
Post Office Box 2183 • Temecula, CA 92592

Sacred Is The Duty Trusted Unto Our Care And With Honor We Rise To The Need

January 18, 2018

Attn: Justin Kirk, Principal Planner
City of Lake Elsinore
Community Development Department, Planning Division
130 South Main Street
Lake Elsinore, CA 92530

RE: AB 52 Consultation; Kassab Travel Center Project – southwest corner of Riverside Drive and Collier Street (APNs 378-030-007, 378-030-009) – City of Lake Elsinore, Riverside County, CA

The Soboba Band of Luiseño Indians has received your notification pursuant under Assembly Bill 52.

Soboba Band of Luiseño Indians is requesting to initiate formal consultation with the City of Lake Elsinore. A meeting can be scheduled by contacting me via email or phone. All contact information has been included in this letter.

I look forward to hearing from and meeting with you soon.

Sincerely,

Joseph Ontiveros, Director of Cultural Resources
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581
Phone (951) 654-5544 ext. 4137
Cell (951) 663-5279
jontiveros@soboba-nsn.gov

Confidentiality: The entirety of the contents of this letter shall remain confidential between Soboba and the City of Lake Elsinore. No part of the contents of this letter may be shared, copied, or utilized in any way with any other individual, entity, municipality, or tribe, whatsoever, without the expressed written permission of the Soboba Band of Luiseño Indians.

From: THPO Consulting
To: "Megan Wilson"
Subject: RE: AB52 Consultation Follow up for the Kassab Travel Center Project
Date: Thursday, January 18, 2018 2:01:34 PM
Attachments: image001.png

Greetings,

A records check of the Tribal Historic preservation office's cultural registry revealed that this project is not located within the Tribe's Traditional Use Area. Therefore, we defer to the other tribes in the area. This letter shall conclude our consultation efforts.

Thank you,

Katie Croft
Cultural Resources Manager
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264
760-699-6829 Office
760-413-6253 Cell
kcroft@aguacaliente.net

From: Megan Wilson [mailto:mwilson@cogstone.com]
Sent: Thursday, January 11, 2018 2:06 PM
To: THPO Consulting <ACBCI-THPO@aguacaliente.net>
Subject: FW: AB52 Consultation Follow up for the Kassab Travel Center Project

Good afternoon,
I am following up on an AB52 request for consultation regarding the Kassab Travel Center Project located in the City of Lake Elsinore, Riverside County.
Attached is a digital version of the original request sent via certified mail on 12/20/2017.
You may forward your comments to me or directly to the lead agency whose contact information is provided on the attached letter.
Thank you,

Appendix D

Paleontological Resources Technical Report

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT FOR THE KASSAB TRAVEL CENTER PROJECT, CITY OF LAKE ELSINORE, CALIFORNIA

Prepared for:
Josh Haskins
Environmental Advisors
2400 E. Katella Avenue, Suite 800
Anaheim, CA 92806

Principal Investigator:
Kim Scott, Principal Paleontologist

August 2017

Project Number: 4083
Type of Study: Paleontological Resources Assessment
Localities: None within five miles of the project in late Pleistocene alluvium
USGS Quadrangle: Elsinore 7.5'
Area: 2.39 acres
Key Words: modern artificial fill (PFYC 1), Holocene to late Pleistocene axial channel deposits (PFYC 2 at surface, PFYC 3a at more than 8 feet deep), early Pleistocene very old alluvial fan (PFYC 3b); negative survey

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Toll free (888) 333-3212

Federal Certifications 8(a), SDB, EDWOSB
State Certifications DBE, WBE, SBE, UDBE

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SUMMARY OF FINDINGS

This purpose of this study was to determine the potential effects on paleontological resources during construction of the Kassab Travel Center Project in the City of Lake Elsinore, Riverside County, California. Planned vertical impacts of this 2.39 acre project are six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

The project surface is mapped entirely as Holocene to late Pleistocene axial channel deposits. Results of the record search indicate that no previous fossil localities have been from late Pleistocene alluvial sediments within five miles of the proposed project. Based on other recorded localities, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep in California valleys.

During the survey, only the surface of the Holocene to late Pleistocene axial channel deposits could be observed. No fossils were encountered during the survey.

The Holocene to late Pleistocene axial channel deposits are ranked as low (Potential Fossil Yield Classification 2) sensitivity at the surface and increasing to moderate and patchy sensitivity (Potential Fossil Yield Classification 3a) at depths of more than 8 ft.

Based on the study findings, fossils are unlikely to be encountered during construction activities. If unanticipated discoveries of paleontological resources occur during construction, all work within 50 feet of the discovery should be halted until the find has been evaluated by a qualified paleontologist.

INTRODUCTION

PURPOSE OF STUDY

This purpose of this study was to determine the potential effects on paleontological resources during construction of the Kassab Travel Center Project (project) in the City of Lake Elsinore, Riverside County, California (Figure 1). This report complies with the California Environmental Quality Act and the City of Lake Elsinore General Plan.

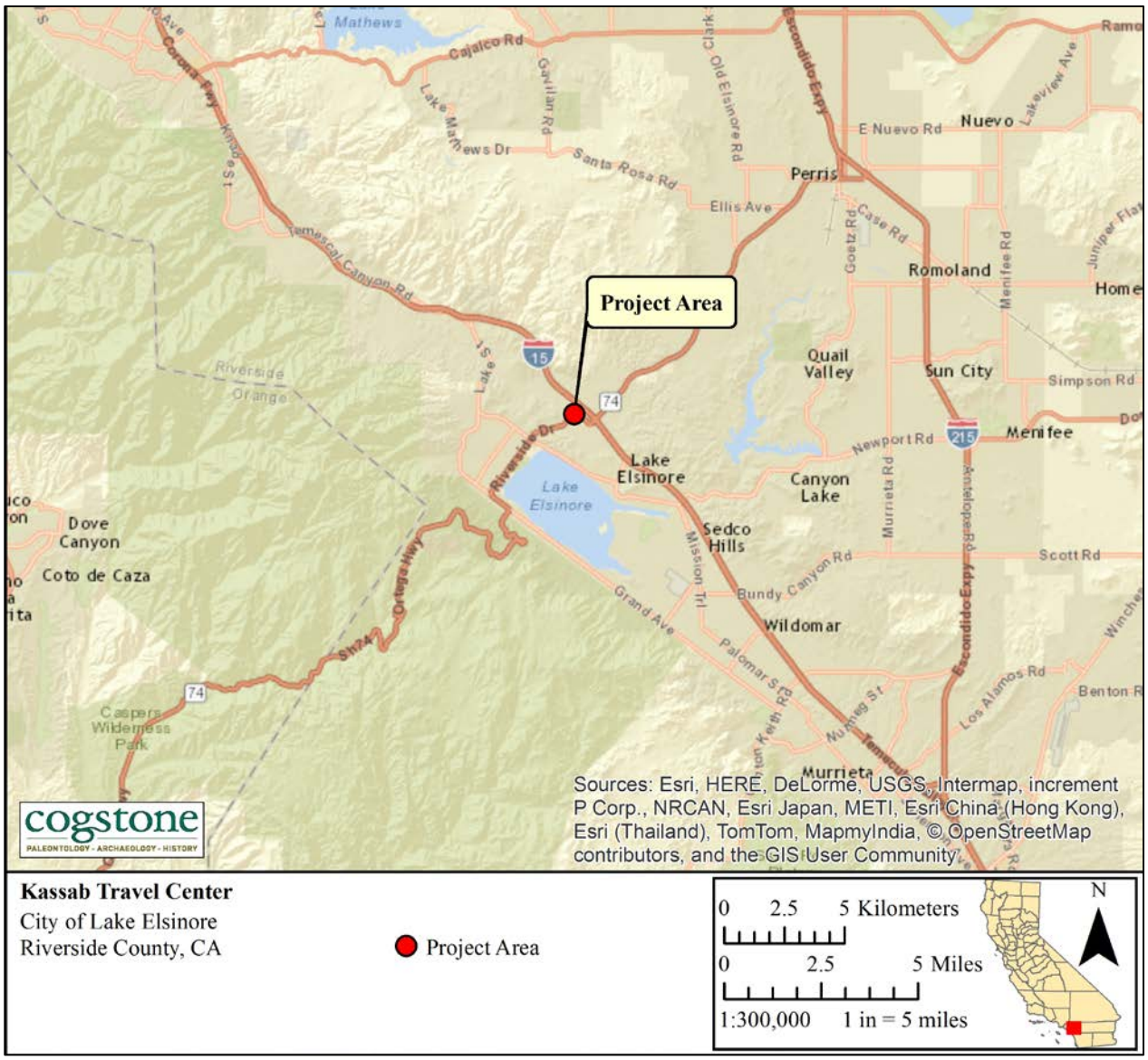

Figure 1. Project vicinity

PROJECT DESCRIPTION AND LOCATION

The proposed Kassab Travel Center will consist of a 6,000 square foot convenience store with three quick serve restaurants, two covered gas dispensing areas totaling 5,264 square feet, and a free standing 2,543 square foot fast food restaurant with a drive-through. Maximum depth of excavation will be six to seven feet for utilities, while the majority of the site will only be excavated two to three feet deep.

This 2.39 acre project is located within the Lake Elsinore 7.5 minute United States Geological Survey (USGS) quadrangle in section 31 of Township 5 South, Range 5 West and section 36 of Township 5 South, Range 4 West, of the San Bernardino Base and Meridian (Figure 2).

PROJECT PERSONNEL

Cogstone conducted the paleontological resources studies and a brief resume of the Principal Investigator are appended (Appendix A). Additional qualifications of key Cogstone staff are available at http://www.cogstone.com/key-staff/

- Kim Scott served as the Principal Paleontologist for the project and wrote this report. Scott has a M. S. in Biology with an emphasis in paleontology from California State University, San Bernardino, a B.S. in Geology with an emphasis in paleontology from the University of California, Los Angeles, and over 20 years of experience in California paleontology and geology.

- Dr. John Harris reviewed this report for quality control. He has a Ph.D. in Geology from the University of Bristol (U.K.), an M.A. in Geology from the University of Texas, Austin, a B.S. in Geology from the University of Leicester (U.K.). Dr. Harris has more than 40 years of experience in Cenozoic paleontology and specializes in terrestrial vertebrate species from Rancho la Brea California and Africa.

- Megan Wilson performed the survey and prepared the Geographic Information System (GIS) maps throughout this report. Wilson has a M.A. in Anthropology from California State University Fullerton, a GIS certification, over five years of experience in California archaeology, and is cross-trained in paleontology.

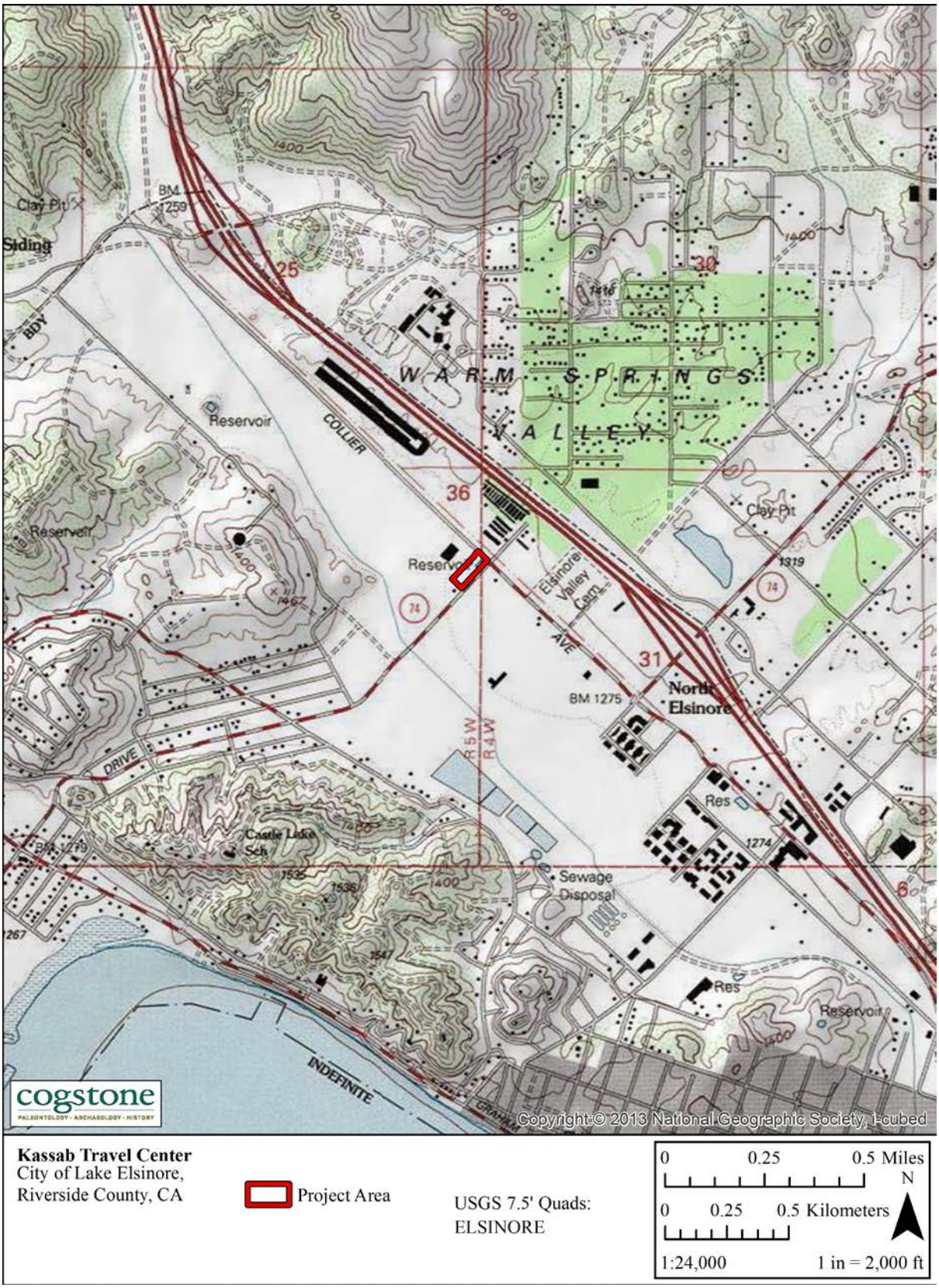

Figure 2. Project location

REGULATORY ENVIRONMENT

STATE LAWS AND REGULATIONS

Paleontological resources are protected by state law. This protection extends to all vertebrate fossils (animals with backbones) and any unique paleontological locality.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. If paleontological resources are identified as being within the proposed project study area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that “No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value.”

CITY OF LAKE ELSINORE

The Project must also comply with the Resource Protection and Preservation Chapter of the Lake Elsinore General Plan approved on December 13, 2011 (Lake Elsinore 2011). The goals and policies for cultural resources are outlined in Goal 6 and Goal 7.

Policy 6.1: Encourage the preservation of significant archaeological, historical, and other cultural resources located within the City.

Policy 7.2: Continue to identify, document, evaluate, designate, and preserve the cultural resources in the City.

Policy 7.3: Continue to update a citywide inventory of cultural resources in conformance with state standards and procedures while maintaining the confidentiality of information as required by law.

PALEONTOLOGICAL RESOURCES SIGNIFICANCE CRITERIA

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful for determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer, 2003; Scott et al., 2004).

BACKGROUND

GEOLOGICAL SETTING

This project is located within the Peninsular Range Geomorphic Province which extends from Mount San Jacinto in the north to Baja, California in the south and includes the Inland Empire, Los Angeles, Orange County, and San Diego areas of California. The Peninsular Ranges Geomorphic Province is located in the southwestern corner of California and is bounded by the Transverse Ranges Geomorphic Province to the north and the Colorado Desert Geomorphic Province to the east. This geomorphic province is characterized by elongated northwest-trending mountain ridges separated by sediment-floored valleys. Many faults to the

west of the Salton Trough section of the San Andreas Fault Zone, parallel this northwest-south east trending fault zone and have taken up some of the strain of the San Andreas. The Lake Elsinore Fault Zone is one such fault zone.

To the north of the project, the San Andreas Fault Zone travels up Cajon Pass where it is the boundary between the Pacific Plate and the North American Plate. The Transverse Ranges include the San Bernardino and San Gabriel mountains along with the paralleling ranges and result from these two plates grinding past each other and "catching" along the bend in the San Andreas. The project is located on the Pacific Plate which is composed of numerous blocks that can move independently (Wagner 2002).

STRATIGRAPHY

The project surface is mapped entirely as Holocene to late Pleistocene (less than 126,000 years old) axial channel deposits. Sediments consist of slightly to moderately indurated, alluvially deposited, silts to sands (Morton and Miller 2006).

PALEONTOLOGICAL RECORD SEARCHES

The records and literature search reviewed information from within five miles of the proposed project. San Bernardino County Museum record searches near to the project were consulted for local information (Scott 2006, 2007, 2014). Online databases including the Natural History Museum of Los Angeles County, Department of Invertebrate Paleontology (LACMIP 2017), the Paleobiology Database (PBDB 2017), and the University of California Museum of Paleontology Database (UCMP 2017) were also searched for localities near to the project. Print resources including published material (Hay 1927; Jefferson 1991a, 1991b, 2012 unpublished) and unpublished project reports (Gust and Wexelblatt 2012) were searched for fossil localities.

Results of the record search indicate that no previous fossil localities have been from late Pleistocene alluvial sediments within five miles of the proposed project. Within California valley areas, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep. Shallower sediments in the valleys usually do not contain the remains of extinct animals, although Holocene remains less than 11,700 years old may be present.

RECONNAISSANCE SURVEY

The survey stage is an important part of the project's environmental assessment phase. The purpose is to confirm that field observations conform to the geological maps of the project area. Sediments are assessed for their potential to contain fossils. Additionally, if there are known paleontological resources the survey will verify the exact location of those resources, the condition or integrity of each resource, and the proximity of the resource to the project area. All undeveloped ground surface areas within the ground disturbance portion of the project area are examined. Existing ground disturbances (e.g., cutbanks, ditches, animal burrows, etc.) are visually inspected. Photographs of the project area, including ground surface visibility and items of interest, are taken with a digital camera.

Megan Wilson performed a joint archaeological and paleontological field survey of the entire project area on May 24, 2017.

SURVEY RESULTS

Ground visibility was a maximum of 30% due overgrowth of weeds (Figure 3). Only the surface of the Holocene to late Pleistocene axial channel deposits could be observed as no culverts, washes, or other cuts were present. Surficial sediments consisted of minimally oxidized, light yellowish grey, silts and sands. Larger clasts consisted entirely of construction materials (concrete, pipe, pebbles, rock, etc.) and other trash (Figure 4). No fossils were encountered during the survey.

Figure 3. Onsite overgrowth

Figure 4. Surficial sediments with dumped pipe and rock

PALEONTOLOGICAL SENSITIVITY

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system (BLM, 2008; Appendix B) has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria

Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to 5 mm in diameter or less. Moreover, fossil preservation also greatly increases after natural burial in rivers, lakes, or oceans. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. So the sands, silts, and clays of rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

Based on other recorded localities, late Pleistocene fossils typically begin appearing about 8 to 10 feet deep in California valleys. Shallower sediments in the valleys usually do not contain the remains of extinct animals, although Holocene (less than 11,700 years old) remains may be present. The Holocene to late Pleistocene axial channel deposits are ranked as low (PFYC 2) sensitivity at the surface and increasing to moderate and patchy sensitivity (PFYC 3a) at depths below 8 feet.

CONCLUSIONS AND RECOMMENDATIONS

The proposed maximum depth of cuts is six to seven feet below the current ground surface. Only Holocene to late Pleistocene axial channel deposits may be impacted by the proposed project construction activities. No late Pleistocene fossils were identified within five miles of the proposed project in sediments comparable to those within the study area. Based on other finds from California valley areas, late Pleistocene fossils typically begin appearing between 8 to 10 feet deep. On this basis, it is considered unlikely that fossils meeting significance criteria will be encountered on this project; therefore, no mitigation is recommended. If unanticipated discoveries of paleontological resources occur during construction, all work within 50 feet of the discovery should be halted until the find has been evaluated by a qualified paleontologist.

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2012 Unpublished updates to Jefferson 1991a, 1991b.

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Scott, E. (Curator of Paleontology, San Bernardino County Museum)
2006 Paleontology literature and records review, Fogarty and Elsinore Substations Project, Lake Elsinore Region, Riverside County, California. On file with Cogstone, Orange, CA.
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APPENDIX A: QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

KIM SCOTT
Principal Investigator for Paleontology
Field & Lab Director for Paleontology

EDUCATION

2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles
2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino

SUMMARY QUALIFICATIONS

Scott has more than 20 years of experience in California paleontology and geology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Temecula Gateway EIR, Riverside County, CA. A Planned Development Overlay/Zone Change and General Plan Amendment. Prepared an assessment report for a 9-acre parcel for the EIR. Sub to PMC. Co-Principal Investigator/Report Co-author. 2015

Interstate 15 (I-15) / Limonite Avenue Interchange Improvement Project, Caltrans District 8, Eastvale, Riverside County, CA. The proposed project would replace the existing Limonite Avenue OC and would widen the roadway from four lanes to six lanes. Prepared a Paleontological Mitigation Plan. Sub to Dokken Engineering. Co-Principal Investigator/Report Co-author. 2015.

Perris Valley Line Project, Metrolink - Riverside County Transportation Commission, Riverside County, CA. The project was a 24-mile extension of the Metrolink 91 Line. Managed paleontological monitoring for construction of four new stations, upgrading associated track and utility relocations to extend the Metrolink connection from Riverside through Moreno Valley to Perris. Prepared an abbreviated Paleontological Assessment, supervised all field activities and prepared the Paleontological Resources Monitoring Compliance Report. Sub to HDR Engineering. Project Manager and Principal Paleontologist. 2013-2016.

SR 91 Widening Project, Caltrans District 8, Riverside, Riverside County, CA. Caltrans widening from the Interstate 60/ State Route 91/ State Route 215 interchange to the Adams Street bridge (Post mile marker 15.6 to 21.6). Construction activities included the addition of two High Occupancy Vehicle (HOV) lanes (one for either direction), interchange reconfiguration, overhead replacement, and undercrossing widening and pavement restriping within the Right of Way (ROW). Supervised paleontological monitoring, monitored, prepared fossils, and prepared the mitigation report. Under contract to Applied Earthworks. Field and Laboratory Supervisor/Report Co-author. 2011-2012.

Fogarty Substation, Southern California Edison, near Lake Elsinore, Riverside County, CA. Project consisted of construction of an Edison substation. Performed site visits, WEAP training, and reporting. Field Director. 2010.

El Casco Substation Project, Southern California Edison, Riverside County. Performed preconstruction mitigation measures and prepared portions of Paleontological Resources Treatment Plan. Field and Lab Director and Report co-author. 2009

APPENDIX B: SENSITIVITY RANKING CRITERIA

PFYC Rank	PFYC Description (BLM, 2007)
1	Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.
2	Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.
3b	Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.
3a	Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.
4	High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.
5	Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.

As per BLM (2008).

Appendix E

Geotechnical Investigation Report

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE

Lake Elsinore, California

Prepared for:
MR. RON KASSAB

Prepared by:
GEOBODEN INC.
Irvine, CA 92620

December 30, 2017

Project No. Lake Elsinore-1-01

GEOBODEN INC.

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

MR. RON KASSAB

Prepared by:

GEOBODEN INC.
5 Hodgenville, Suite A.
Irvine, California 92620

December 30, 2017

JOB NO. Lake Elsinore-1-01

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017 Project No. Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: Geotechnical Investigation Report
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

GeoBoden, Inc. (GeoBoden) is pleased to submit herewith our geotechnical investigation report for the Proposed Kassab Travel Center to be constructed at 29301 Riverside Drive in the city of Lake Elsinore, California.

This report presents the results of our field investigation, laboratory testing and our engineering judgment, opinions, conclusions and recommendations pertaining to geotechnical design aspects of the proposed development.

It has been a pleasure to be of service to you on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please do not hesitate to contact us.

Respectfully submitted,
GEOBODEN, INC.

Cyrus Radvar,
Principal Engineer, G.E. 2742

Copies: 4/Addressee

GEOTECHNICAL INVESTIGATION REPORT

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

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FIGURES

Figure 1 Vicinity Map
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GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
Lake Elsinore, California

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by GeoBoden, Inc. (GeoBoden) for the Proposed Kassab Travel Center to be located at 29301 Riverside Drive in Lake Elsinore, California. The general location of the project is shown on Figure 1.

The purposes of this investigation were to determine the geotechnical properties of subsurface soil conditions, to evaluate their in-place characteristics, evaluate site seismicity, and to provide geotechnical recommendations with respect to site grading and for design and construction of proposed foundations and other site improvements.

The scope of the authorized investigation included performing a site reconnaissance, conducting field exploration and laboratory testing programs, performing engineering analyses, and preparing this Geotechnical Investigation Report. Evaluation of environmental issues or the potential presence of hazardous materials was not within the scope of services provided.

This report has been prepared for RON KASSAB and their other project team members, to be used solely in the development of facilities described herein. This report may not contain sufficient information for other uses or the purposes of other parties.

2.0 SITE LOCATION AND PROJECT DESCRIPTION

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The site is bounded by Collier Avenue on the east, by an existing building on the north, by a vacant land on the west, and by Riverside Drive on the south. The subject property is presently occupied by a vacant land.

The maximum column load for the new building will be about 75 kips, and the line load will be about 3 kips per lineal feet. Currently, it is our understanding that the proposed building will consist of masonry construction with slab on-grade.

3.0 GEOTECHNICAL INVESTIGATION

Our geotechnical investigation included a field exploration program and a laboratory testing programs. These programs were performed in accordance with our scope of services. The field exploration and laboratory testing programs are briefly described below. A more detailed description of the field exploration and laboratory testing programs is provided in Appendix A and Appendix B, respectively.

3.1 FIELD EXPLORATION PROGRAM

The field exploration program was initiated on December 18, 2017 under the supervision of an engineer. Eight (8) exploratory borings were drilled using a truck-mounted drilling rig equipped with 8-inch diameter hollow stem augers. The borings were advanced to depths of ranging from 11.5 to 31.5 feet (below ground surface). The approximate locations of exploratory borings are shown on Figure 2.

Logs of subsurface conditions encountered in the borings were prepared in the field by a representative of our firm. Soil samples consisting of relatively undisturbed brass ring samples and Standard Penetration Tests (SPT) samples were collected at approximately 5-foot depth intervals and were returned to the laboratory for testing. The SPTs were performed in accordance with ASTM D 1586. Final boring logs were prepared from the field logs and are presented in Appendix A.

3.2 LABORATORY TESTING

Selected samples collected during drilling activities were tested in the laboratory to assist in evaluating controlling engineering properties of subsurface materials at the site. Physical tests performed included moisture and density determination, consolidation, expansion index, No. 200 Sieve, Atterberg limits, and corrosion. The results of laboratory are presented in Appendix B.

4.0 DISCUSSION OF FINDINGS

The following discussion of findings for the site is based on the results of the field exploration and laboratory testing programs.

4.1 SITE AND SUBSURFACE CONDITIONS

Observed subsurface native soils consisted of sandy clay, clay, clay with sand, sand and sand with silt to the maximum explored depth of 31.5 feet below ground surface (bgs).

Based on blow counts recorded during sampling, the clayey soils encountered within borings were found to be firm to stiff. The sandy soil was found to be medium dense. For a more detailed description of the subsurface materials refer to the boring logs included in Appendix A of this report.

4.2 GROUNDWATER CONDITIONS

Groundwater was encountered within our exploratory boring B-1 through B-5 at 15 feet bgs. Based on information from the nearby wells (http://www.water.ca.gov/waterdatalibrary/), the historic high ground water level in the site vicinity is at a depth of greater than 50 feet beneath the existing ground surface.

Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

4.3 SOIL ENGINEERING PROPERTIES

Physical tests were performed on the relatively undisturbed samples to characterize the engineering properties of the native soils. Moisture content determination was performed on the samples to evaluate the in-situ moisture content. Moisture content and dry unit weight results are included in Appendix B.

4.4 CONSOLIDATION CHARACTERISTICS

Consolidation tests were performed on samples of the existing fill and native overburden soils recovered from the boring. Results of the consolidation tests indicate that the overburden material will have moderate compressibility under the anticipated loads. These characteristics are compatible with the allowable bearing capacity values and corresponding settlement estimates presented in Foundations Section of our report.

4.5 COLLAPSE POTENTIALS

Results of consolidation tests on samples of native soil indicate that the native soils will have low collapse potential. Removal and recompaction of the surficial soils is expected to reduce the anticipated amount of total differential settlement within the site.

4.6 EXPANSIVE SOILS

Preliminary laboratory testing of representative sample of onsite soils indicate that these materials exhibit LOW expansion potential. We anticipate that the design and performance of the proposed new building will not be affected by expansion of onsite soils.

5.0 STRONG GROUND MOTION POTENTIAL

The project site is located in a seismically active area typical of Southern California and likely to be subjected to a strong ground shaking due to earthquakes on nearby faults.

The Elsinore (Glen Ivy) rev fault is the closest known active fault, located 1.91-km of the site with an anticipated maximum moment magnitude (M_w) of 7.7.

5.1 CBC DESIGN PARAMETERS

To accommodate effects of ground shaking produced by regional seismic events, seismic design can, at the discretion of the designing Structural Engineer, be performed in accordance with the 2016 edition of the California Building Code (CBC). Table below, 2016 CBC Seismic Parameters, lists (next) seismic design parameters based on the 2016 CBC methodology, which is based on ASCE/SEI 7-10:

2016 CBC Seismic Design Parameters	Value
Site Latitude (decimal degrees)	33.6947
Site Longitude (decimal degrees)	-117.3471
Site Class Definition (ASCE 7 Table 20.3-1)	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Figure 1613.3.1(1))	2.293
Mapped Spectral Response Acceleration at 1s Period, S_1 (Figure 1613.3.1(2))	0.915
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613.3.3(1))	1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613.3.3(2))	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16-37)	2.293
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16-38)	1.372
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16-39)	1.528
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16-40)	0.915

6.0 LIQUEFACTION POTENTIAL

For liquefaction to occur, all of three key ingredients are required: liquefaction-susceptible soils, groundwater within a depth of 50 feet or less, and strong earthquake shaking. Soils susceptible to liquefaction are generally saturated loose to medium dense sands and non-plastic silt deposits below the water table.

Groundwater was encountered within our borings B-1 through B-5 at 15 feet. Historic high groundwater at the site is as deep as 50 feet. Soil materials encountered within our borings are clayey soil. It is our opinion that potential for liquefaction at the site is low.

7.0 DESIGN RECOMMENDATIONS

Based upon the results of our investigation, the proposed development is considered geotechnically feasible provided the recommendations presented herein are incorporated into the design and construction. If changes in the design of the structure are made or variations or changed conditions are encountered during construction, GeoBoden should be contacted to evaluate their effects on these recommendations. The following geotechnical engineering recommendations for the proposed buildings are based on observations from the field investigation program and the physical test results.

7.1 EARTHWORK

All earthworks, including excavation, backfill and preparation of subgrade, should be performed in accordance with the geotechnical recommendations presented in this report and applicable portions of the grading code of local regulatory agencies. All earthwork should be performed under the observation and testing of a qualified geotechnical engineer.

7.2 SITE AND FOUNDATION PREPARATION

All site preparation should be observed by experienced personnel reporting to the project Geotechnical Engineer. Our field monitoring services are an essential continuation of our prior studies to confirm and correlate the findings and our prior recommendations with the actual subsurface conditions exposed during construction, and to confirm that suitable fill soils are placed and properly compacted.

Clearing operations should include the removal of all surface vegetation. Large shrubs, when removed, should be grubbed out to include their stumps and major root systems.

In general, all fill soils within the proposed building footprints should be overexcavated and replaced with engineered fill. As a minimum, removals should extend to competent native soils. At least 3 feet of compacted fill should be provided underneath all spread footings and floor slabs. The compacted fill should extend laterally a minimum of 5 feet beyond the foundation footprints, where possible. All existing low-density, near-surface soils will require removal to competent material from areas to receive newly compacted fill. The basis for establishing a competent exposed surface on which to place fill should consist of competent materials exhibiting an in-place relative compaction of at least 85 percent. Prior to placing structural fill, exposed bottom surfaces in each removal area approved for fill should first be scarified to a depth of at least 6 inches, water or air dried as necessary to achieve 3 percent above optimum moisture conditions, and then recompacted in place to a minimum relative compaction of 90 percent.

Based on the observations made in our borings and the results of pertinent laboratory tests, anticipated depths of removal of unsuitable soils will range from 4 to 5 feet. However, actual removal depths will have to be determined during grading on the basis of in-grading observations and testing performed by a representative of geotechnical consultants.

To provide support for foundations for minor structures and for at-grade concrete walks and slabs, all existing fill and disturbed natural soils should be excavated and replaced with properly compacted fill. Any required fill should be properly compacted as specified below.

At least the upper six (6) inches of all excavated surfaces should be scarified and moisture conditioned to 3 percent above optimum moisture, if necessary, and compacted to at least 90 percent relative compaction as per ASTM Standard D1557 test method, prior to placing any fill and/or structures.

7.3 FILL PLACEMENT AND COMPACTION REQUIREMENTS

Material for engineered fill should be select free of organic material, debris, and other deleterious substances, and should not contain fragments greater than 3 inches in maximum dimension. On-site excavated soils that meet these requirements may be used to backfill the excavated building pad area.

All fill should be placed in 6-inch-thick maximum lifts, watered or air dried as necessary to 3 percent above optimum moisture content, and then compacted in place to a maximum relative compaction of 90 percent. The laboratory maximum dry density and optimum moisture content for each change in soil type should be determined in accordance with Test Method ASTM D 1557. A representative of the project consultant should be present on-site during grading operations to verify proper placement and compaction of all fill, as well as to verify compliance with the other geotechnical recommendations presented herein.

Imported soils, if any, should consist of clean materials exhibiting a VERY LOW expansion potential (Expansion Index less than 20). Soils to be imported should be approved by the project geotechnical consultant prior to importation.

7.4 GEOTECHNICAL OBSERVATIONS

Exposed bottom surfaces in each removal area should be observed and approved by the project geotechnical consultant prior to placing fill. No fill should be placed without prior approval from the geotechnical consultant.

The project geotechnical consultant should be present on site during grading operations to verify proper placement and compaction of fill, as well as to verify compliance with the recommendations presented herein.

7.5 UTILITY TRENCH BACKFIL

All utility trench backfill should be compacted to a minimum relative compaction of 90 percent. Trench backfill materials should be placed in lifts no greater than approximately 6 inches in thickness, watered or air-dried as necessary to 3 percent above optimum moisture content, and then mechanically compacted in place to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should probe and test the backfills to verify adequate compaction.

As an alternative for shallow trenches where pipe or utility lines may be damaged by mechanical compaction equipment, such as under floor slabs, imported clean sand exhibiting a sand equivalent (SE) value of 30 or greater may be utilized. The sand backfill materials should be watered to achieve 3 percent above optimum moisture conditions and then tamped into place. No specific relative compaction will be required; however, observation, probing, and if deemed necessary, testing should be performed by a representative of the project geotechnical consultant to verify an adequate degree of compaction and that the backfill will not be subject to settlement.

Where utility trenches enter the footprint of the floor slabs, they should be backfilled through their entire depths with on-site fill materials, sand-cement slurry, or concrete rather than with any sand or gravel shading. This "Plug" of less- or non-permeable materials will mitigate the potential for water to migrate through the backfilled trenches from outside to the areas beneath the foundations and floor slabs.

7.6 SHALLOW FOUNDATIONS

Following the site and foundation preparation recommended above, foundation for load bearing walls and interior columns may be designed as discussed below.

7.6.1 Bearing Capacity and Settlement

Load bearing walls and interior columns may be supported on continuous spread footings and isolated spread footings, respectively, and should bear entirely upon undisturbed native or properly engineered fill. Continuous and isolated footings should have a minimum width of 18 inches and 24 inches, respectively. All footings should be embedded a minimum depth of 24 inches measured from the lowest adjacent finish grade. Continuous and isolated footings placed on such materials may be designed using an allowable (net) bearing capacity of 1,800 pounds per square foot (psf) respectively. Allowable increases of 200 psf for each additional 1 foot in width and 200 psf for each additional 6 inches in depth may be utilized, if desired. The maximum allowable bearing pressure should be 2,500 psf. The maximum bearing value applies to combined dead and sustained live loads. The allowable bearing pressure may be increased by one-third when considering transient live loads, including seismic and wind forces.

Based on the allowable bearing value recommended above, total settlement of the shallow footings are anticipated to be less than one inch, provided foundation preparations conform to the recommendations described in this report. Differential settlement is anticipated to be approximately half the total settlement for similarly loaded footings spaced up to approximately 30 feet apart.

7.6.2 Lateral Load Resistance

Lateral load resistance for the spread footings will be developed by passive soil pressure against sides of footings below grade and by friction acting at the base of the concrete footings bearing on compacted fill. An allowable passive pressure of 200 psf per foot of depth may be used for design purposes. An allowable coefficient of friction 0.30 may be used for dead and sustained live load forces to compute the frictional resistance of the footings constructed directly on compacted fill. Safety factors of 2.0 and 1.5 have been incorporated in development of allowable passive and frictional resistance values, respectively. Under seismic and wind loading conditions, the passive pressure and frictional resistance may be increased by one-third.

7.6.3 Footing Reinforcement

Reinforcement for footings should be designed by the structural engineer based on the anticipated loading conditions. Footings for structures that are supported in low expansive soils should have No. 4 bars, two top and two bottom.

7.7 CONCRETE SLAB ON-GRADE

Concrete slabs will be placed on undisturbed natural soils or properly compacted fill as outlined in Section 7.2. Moisture content of subgrade soils should be maintained 3 percent above the optimum moisture content.

At the time of the concrete pour, subgrade soils should be firm and relatively unyielding. Any disturbed soils should be excavated and then replaced and compacted to a minimum of 90 percent relative compaction. Slabs should be designed to accommodate low expansive fill soils. The structural engineer should determine the minimum slab thickness and reinforcing depending upon the expansive soil condition intended use. Slabs placed on low expansive soils should be at least 4 inches thick and have minimum reinforcement of No. 3 bars placed at mid-height of the slabs and spaced 18 inches on centers, in both directions. The structural engineer may require thicker slabs with more reinforcement depending on the anticipated slab loading conditions.

If moisture-sensitive floor covering is planned, a layer of open-graded gravel, at least 4 inches thick, should be placed below the concrete slab to form a capillary break. Alternately, moisture-proof membrane (such as 10-mil) may be utilized. The vapor barrier should be placed between sand layers (2 inches above and below) to protect the membrane from damage during construction. Gravel for use under a concrete floor slab should be clean, crushed rock that meets the gradation requirements presented below.

Sieve Size	Percentage
1 inch	100
¾ inch	90-100

No. 4 0-10

7.8 PRELIMINARY PAVEMENT DESIGN

Pavement design should be confirmed at the completion of site grading when the subgrade soils are in-place. This should include sampling and R-Value testing of the actual subgrade soils and an analysis based upon the anticipated traffic loading.

For a preliminary pavement design, recommendations for pavement design section of asphalt parking areas are provided below. These values are based on an assumed R-value of 25.

For pavement design, Traffic indexes (TI) of 4.0 and 5.5 were used for the parking areas and auto driveways, respectively. The preliminary flexible pavement layer thickness is as follows:

RECOMMMENDED ASPHALT PAVEMENT SECTION LAYER THICKNESS

Pavement Material	Recommended Thickness	
	TI = 4.0	TI = 5.5
Asphalt Concrete Surface Course	3 inches	4 inches
Class II Aggregate Base Course	6 inches	8 inches
Compacted Subgrade Soils	12 inches	12 inches

Asphalt concrete should conform to Sections 203 and 302 of the latest edition of the Standard Specifications for Public Works Construction ("Greenbook").

Class II aggregate base should conform to Section 26 of the Caltrans Standard Specifications, latest edition. The aggregate base course should be compacted to at least 95 percent of the maximum dry density as determined by ASTM Method D 1557.

Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for three Traffic Indices are presented below. We have assumed that the portland cement concrete will have a compressive strength of at least 3,000 pounds per square inch.

Assumed Traffic Index	PCC Paving (Inches)	Base Course (Inches)
4½ (Automobile Parking)	7	4
5½ (Driveways and Light Track Traffic)	7½	4
6½ (Roadways and Heavy Truck Traffic)	8	4

7.9 SOLUBLE SULFATES AND SOIL CORROSIVITY

Concrete subject to exposure to sulfates shall comply with the requirements set forth in ACI 318, Section 4.3. Based on the available water soluble sulfate results the corrosion potential to buried concrete should be considered "low", i.e., exposure Class S_0, per ACI 318, Table 4.2.1. Consequently, injurious sulfate attack is not a concern with a minimum 28-day compressive strength of 2,500 psi.

Per CBC 2016, Section 1904.4, concrete reinforcement should be protected from corrosion and exposure to chlorides in accordance with ACI 318, Section 4.4.

The corrosion potential of the on-site materials to buried steel was evaluated in accordance with Caltrans corrosive environment evaluation criteria. Caltrans considers a site corrosive, if at least one of the following conditions exists:

- Chloride content ≥ 500 ppm;
- Soluble sulphate content ≥ 2,000 ppm;
- pH ≤ 5.5.

Observations and laboratory tests indicate that based on the Caltrans' criteria the soils at the site are considered non-corrosive. If additional recommendations are desired, it is recommended that a corrosion specialist be consulted regarding suitable types of piping and necessary protection for underground metal conduits.

8.0 CONSTRUCTION CONSIDERATIONS

Based on our field exploration program, earthwork can be performed with conventional construction equipment.

8.1 TEMPORARY DEWATERING

Groundwater was encountered within our borings at 15 feet below ground surface. Based on the anticipated excavation depths, the need for temporary dewatering is considered low.

8.2 CONSTRUCTION SLOPES

Excavations during construction should be conducted so that slope failure and excessive ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsoils, height of the excavation and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall and desiccation.

Where space permits, and providing that adjacent facilities are adequately supported, open excavations may be considered. In general, unsupported slopes for temporary construction excavations should not be expected to stand at an inclination steeper than 1:1 (horizontal:vertical). The temporary excavation side walls may be cut vertically to a height of 3 feet and then laid back at a 1:1 slope ratio above a height of 3 feet.

Surcharge loads should be kept away from the top of temporary excavations a horizontal distance equal to at least one-half the depth of excavation. Surface drainage should be controlled along the top of temporary excavations to preclude wetting of the soils and erosion of the excavation faces. Even with the implementation of the above recommendations, sloughing of the surface of the temporary excavations may still occur, and workmen should be adequately protected from such sloughing.

If site conditions do not provide sufficient space for sloped excavations at the project site, slot cutting techniques in a repeating "ABC" sequence may be required. First, all the slots designated as "A" should be excavated, backfilled and recompacted. The procedure should continue with the "B" slots and end with the "C" slots. The width of each slot should not exceed 6 feet. If any evidence of potential instability is observed, revised recommendations such as narrower slot cuts may be necessary. All slot excavation and backfilling procedures should be performed under the observation and testing of a qualified geotechnical engineer.

9.0 POST INVESTIGATION SERVICES

Final project plans and specifications should be reviewed prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. Following review of plans and specifications, observation should be performed by the geotechnical engineer during construction to document that foundation elements are founded on/or penetrate onto the recommended soils, and that suitable backfill soils are placed upon competent materials and properly compacted at the recommended moisture content.

10.0 CLOSURE

The conclusions, recommendations, and opinions presented herein are: (1) based upon our evaluation and interpretation of the limited data obtained from our field and laboratory programs; (2) based upon an interpolation of soil conditions between and beyond the borings; (3) are subject to confirmation of the actual conditions encountered during construction; and, (4) are based upon the assumption that sufficient observation and testing will be provided during construction.

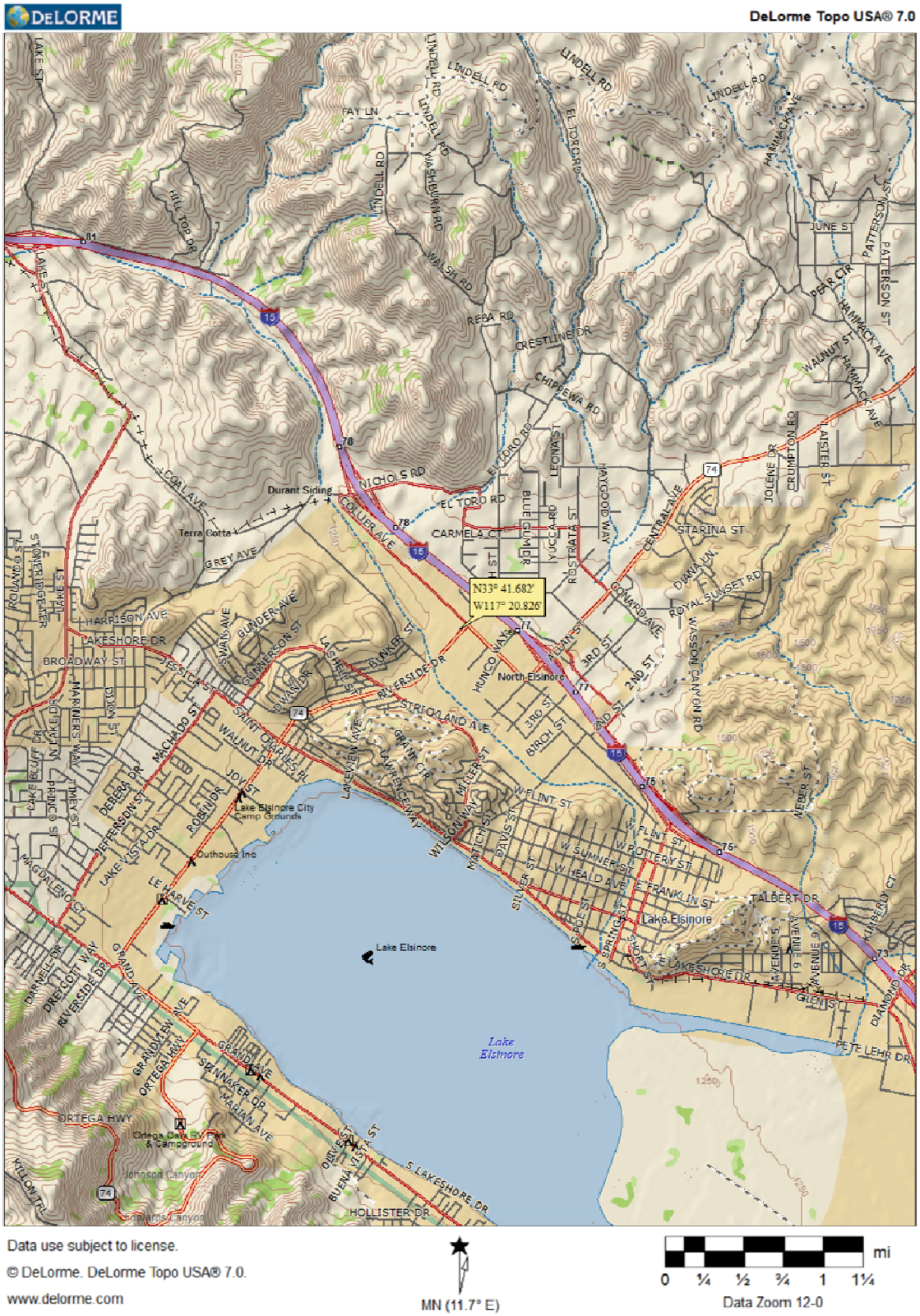
If parties other than GeoBoden are engaged to provide construction geotechnical services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the findings and recommendations in this report or providing alternate recommendations.

If pertinent changes are made in the project plans or conditions are encountered during construction that appear to be different than indicated by this report, please contact this office. Significant variations may necessitate a re-evaluation of the recommendations presented in this report.

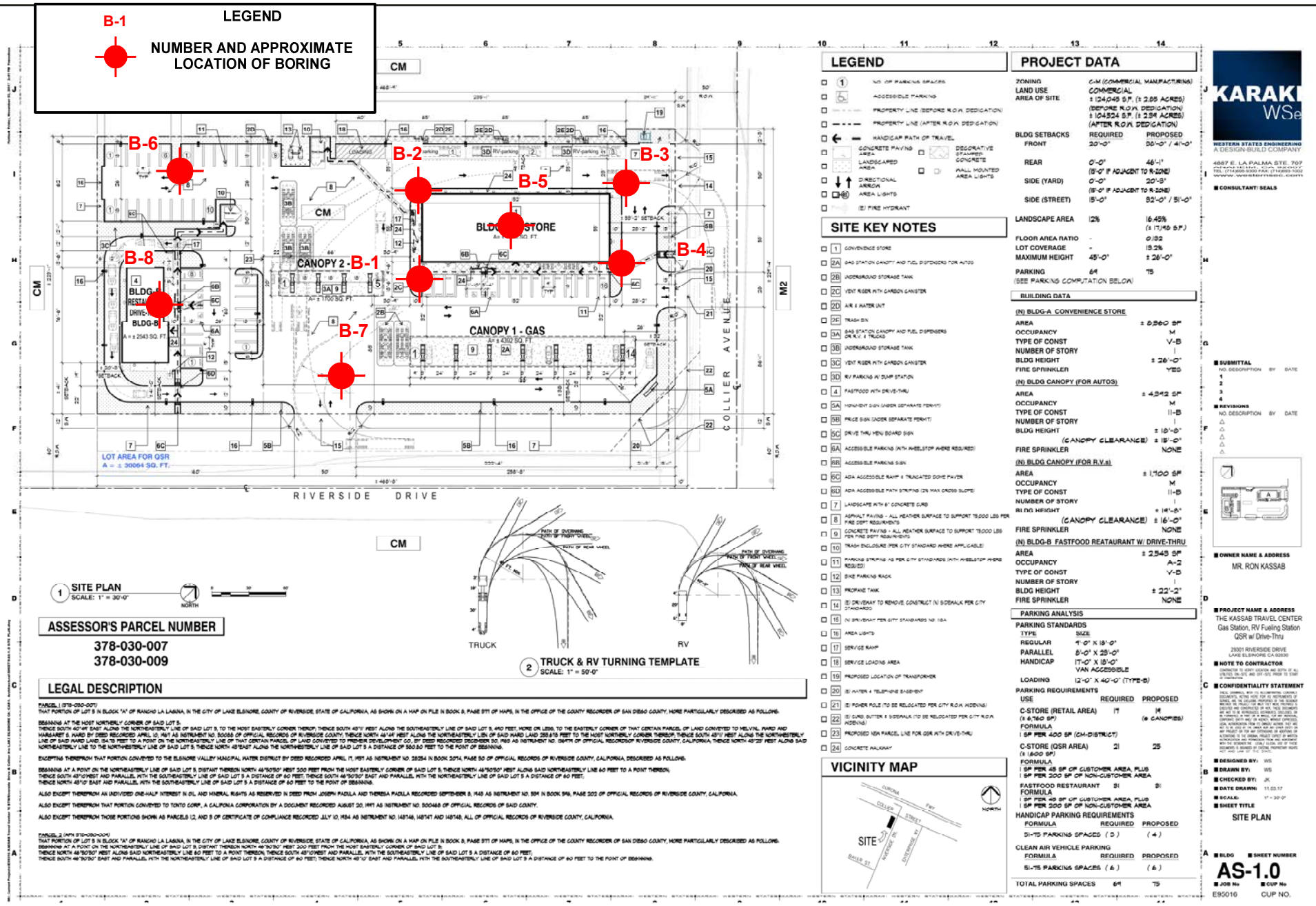
11.0 REFERENCES

California Building Code, 2016 Volume 2.

FIGURES



GEOBODEN INC. Geotechnical Consultants	**SITE VICINITY MAP** **Proposed Kassab Travel Center** **29301 Riverside Drive** **Lake Elsinore, California**	Figure By S.R.	Project No. Lake Elsinore
		Map No. XX	Figure No. 1
		Date 12-30-17	



LEGAL DESCRIPTION

PARCEL 1 (378-030-007)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 5;
THENCE SOUTH 40°48' EAST ALONG THE NORTHEASTERLY LINE OF SAID LOT 5, TO THE MOST EASTERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE SOUTHEASTERLY LINE OF SAID LOT 5, 440 FEET, MORE OR LESS, TO THE EASTERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO MELVIN L. WARD AND MARGARET S. WARD BY DEED RECORDED APRIL 10, 1961 AS INSTRUMENT NO. 50066 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY; THENCE NORTH 46°48' WEST ALONG THE NORTHEASTERLY LINE OF SAID WARD LAND, 259.615 FEET TO THE MOST NORTHERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE NORTHWESTERLY LINE OF SAID WARD LAND, 264.75 FEET TO A POINT ON THE NORTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND CONVEYED TO PREMIER DEVELOPMENT CO., BY DEED RECORDED DECEMBER 30, 1960 AS INSTRUMENT NO. 138478 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA; THENCE NORTH 40°29' WEST ALONG SAID NORTHEASTERLY LINE TO THE NORTHWESTERLY LINE OF SAID LOT 5; THENCE NORTH 49°EAST ALONG THE NORTHWESTERLY LINE OF SAID LOT 5 A DISTANCE OF 560.50 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT BY DEED RECORDED APRIL 17, 1957 AS INSTRUMENT NO. 28294 IN BOOK 2074, PAGE 50 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 46°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5; THENCE NORTH 46°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON;
THENCE SOUTH 43°10'WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE SOUTH 46°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE NORTH 43°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN OIL AND MINERAL RIGHTS AS RESERVED IN DEED FROM JOSEPH PADILLA AND THERESA PADILLA RECORDED SEPTEMBER 8, 1948 AS INSTRUMENT NO. 504 IN BOOK 946, PAGE 202 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO TONTO CORP., A CALIFONIA CORPORATION BY A DOCUMENT RECORDED AUGUST 20, 1991 AS INSTRUMENT NO. 300468 OF OFFICIAL RECORDS OF SAID COUNTY.

ALSO EXCEPT THEREFROM THOSE PORTIONS SHOWN AS PARCELS 1,2, AND 3 OF CERTIFICATE OF COMPLIANCE RECORDED JULY 10, 1984 AS INSTRUMENT NO. 148148, 148147 AND 148149, ALL OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (APN 378-030-004)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 46°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5;
THENCE NORTH 46°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON; THENCE SOUTH 43°10'WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE SOUTH 46°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE NORTH 43°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

GEOBODEN INC. Geotechnical Consultants	BORING LOCATION PLAN Proposed Kassab Travel Center 29301 Riverside Drive Lake Elsinore, California	Figure By S.R.	Project No. Lake Elsinore
		Map No. XX	Figure No. 2
		Date 12-30-17	

APPENDIX A
BORING LOGS

APPENDIX A
SUBSURFACE EXPLORATION PROGRAM

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Prior to drilling, the proposed borings were located in the field by measuring from existing site features.

A total of 8 exploratory borings (B-1 through B-8) were drilled using a hollow-stem auger drill rig equipped with 8-inch outside diameter (O.D.) augers and hand-auger equipment. GeoBoden, Inc. of Irvine, California performed the drilling on December 18, 2017. The borings locations are shown on Figure 2.

Depth-discrete soil samples were collected at selected intervals from the exploratory borings using a 2 ½ -inch inside diameter (I.D.) modified California Split-barrel sampler fitted with 12 brass ring of 2 ½ inches in O.D. and 1-inch in height and one brass liner (2 ½ -inch O.D. by 6 inches long) above the brass rings. The sampler was lowered to the bottom of the boreholes and driven 18 inches into the soil with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the lower 12 inches is shown on the blow count column of the boring logs.

After removing the sampler from the boreholes, the sampler was opened and the brass rings and liner containing the soil were removed and observed for soil classification. Brass rings containing the soil were sealed in plastic canisters to preserve the natural moisture content of the soil. Soil samples collected from exploratory borings were labeled, and were transported for physical testing.

Standard Penetration Tests (SPTs) were also performed. The SPT consists of driving a standard sampler, as described in the ASTM 1586 Standard Method, using a 140-pound hammer falling 30 inches. The number of blows required to drive the SPT sampler the lower 12 inches of the sampling interval is recorded on the blow count column of the boring logs.

The soil classifications and descriptions on field logs were performed using the Unified Soil Classification System as described by the American Society for Testing and Materials (ASTM) D 2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." The final boring logs were prepared from the field logs and are presented in this Appendix.

At the completion of the sampling and logging, the exploratory borings were backfilled with the drilled cuttings.

GEOBODEN, INC.

BORING NUMBER B-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12		97	24	49	18	31	69
10		SANDY CLAY (CL): strong brown, moist, ~30% fine sand, ~70% fines	SS S-2		14			28				70
15		▽ light brown, wet	MC R-3		12							
20			SS S-4		14							
25		brown, wet	SS S-5		12							
30		SAND (SP): yellowish brown, wet, coarse sand	SS S-6		16							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION ___ **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY** ___
AT END OF DRILLING ---
NOTES ___
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, fine sand										
5			MC R-1		16		99	25				
10			SS S-2		11							
15		SANDY CLAY (CL): yellowish brown, moist, ~30% fine sand, ~70% fines ▽	MC R-3		12							
20		SAND (SP): light yellowish brown, wet, coarse sand	SS S-4		15							
25		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines	SS S-5		21							
30			SS S-6		26							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		13		100	26				
10			SS S-2		16							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
15		▽	MC R-3		19							
20			SS S-4		14							
25		wet	SS S-5		12							
		SAND w. SILT (SP-SM): yellowish brown, wet										
30			SS S-6		16							
		Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-4

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		CLAY (CL): grayish brown, moist										
5			MC R-1		19		103	27				
		CLAY w. SAND (CL): yellowish brown, moist, ~20% fine sand, ~80% fines [NATIVE]										
10			SS S-2		26							
15		▽	MC R-3		36							
20			SS S-4		29							
		Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-5

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		14		104	27				
10		CLAY (CL): brown, moist, ~10% fine sand, ~90% fines	SS S-2		11							
15	▽		MC R-3		14							
20			SS S-4		18							

Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.

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GEOBODEN, INC.

BORING NUMBER B-6

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		11		103	26				
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		14							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-7

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		16							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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GEOBODEN, INC.

BORING NUMBER B-8

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		16							
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		18							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

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APPENDIX B
LABORATORY TESTING

APPENDIX B
LABORATORY TESTING
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Laboratory tests were performed on selected samples to assess the engineering properties and physical characteristics of soils at the site. The following tests were performed:

- moisture content and dry density
- No. 200 Wash sieve
- Atterberg limits
- consolidation
- expansion potential
- corrosion

Test results are summarized on laboratory data sheets or presented in tabular form in this appendix.

Moisture Density Tests

The field moisture contents, as a percentage of the dry weight of the soils, were determined by weighing samples before and after oven drying. The dry density, in pounds per cubic foot, was also determined fir all relatively undisturbed ring samples collected. These analyses were performed in accordance with ASTM D 2937. The results of these determinations are shown on the boring logs in Appendix A.

No. 200 Wash Sieve

A quantitative determination of the percentage of soil finer than 0.075 mm was performed on a selected soil sample by washing the soil through the No. 200 sieve. Test procedures were performed in accordance with ASTM Method D1140. The results of the tests are shown on the boring logs.

Atterberg Limits

Liquid limit, plastic limit, and plasticity index were determined for selected soil sample in accordance with ASTM D 4318. The soil sample was air-dried and passed through a No. 40 sieve and moisturized. The liquid and plastic limit tests were performed on the fraction passing the No. 40 sieve. Results of the Atterberg limits tests are shown graphically and presented in this Appendix.

Consolidation

The test was performed in accordance with ASTM Test method D 2345. The compression curve from the consolidation test is presented in this Appendix.

Expansion Potential

Expansion index test was performed on a representative sample of the on-site soils in accordance with ASTM D4829. The result of the expansion test is summarized in Table B-1.

TABLE B-1 (Expansion Index Test Data)

Boring Designation	**Depth (ft)**	Expansion Index (EI)
B-1	0-5	22

Corrosion Potential

A selected soil sample was tested to determine the corrosivity of the site soil to steel and concrete. The soil sample was tested for soluble sulfate (Caltrans 417), soluble chloride (Caltrans 422), and pH and minimum resistivity (Caltrans 643). The results of corrosion tests are summarized in Table B-2.

TABLE B-2 (Corrosion Test Results)

Boring No.	**Depth (ft)**	**Chloride Content (Calif. 422) ppm**	**Sulfate Content (Calif. 417) % by Weight**	**pH (Calif. 643)**	**Resistivity (Calif. 643) Ohm*cm**
B-1	0-5	89	0.0178	7.6	1,058

GEOBODEN, INC.

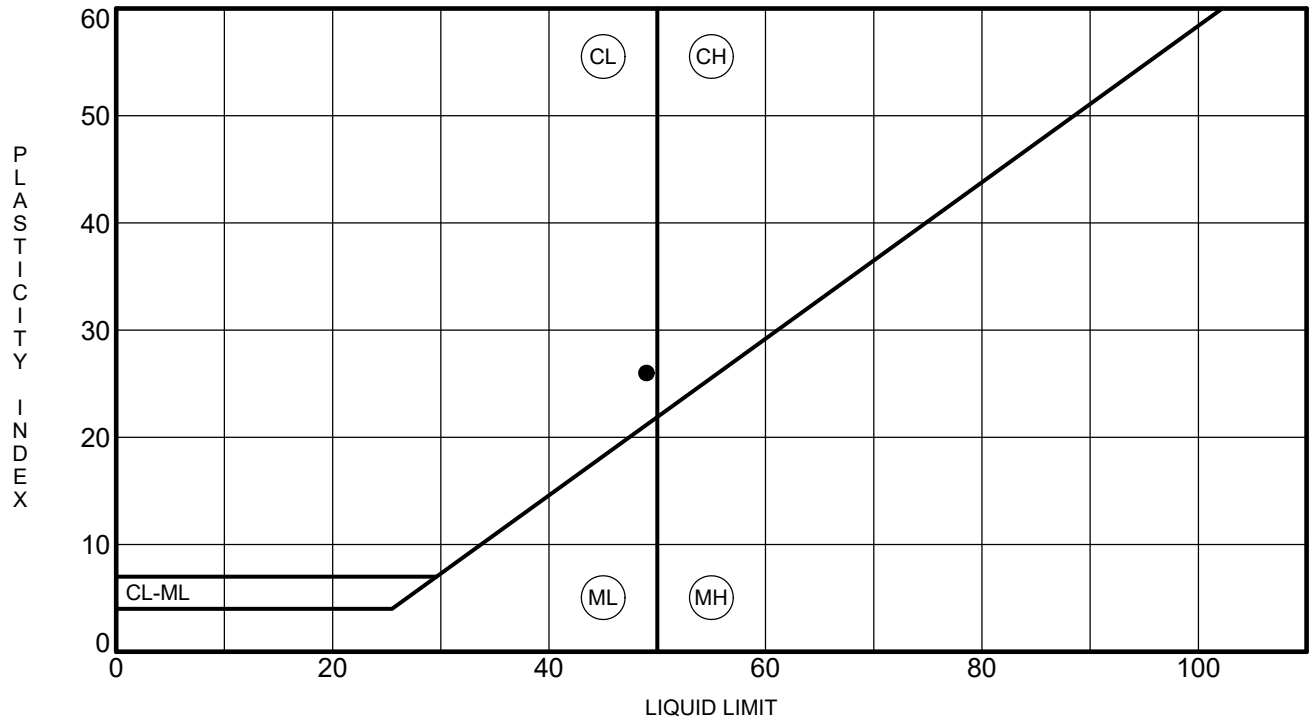
ATTERBERG LIMITS' RESULTS

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**B-1**	**5.0**	**49**	**23**	**26**	**69**	**SANDY LEAN CLAY(CL)**

ATTERBERG LIMITS - GINT STD US LAB.GDT - 12/30/17 11:40 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

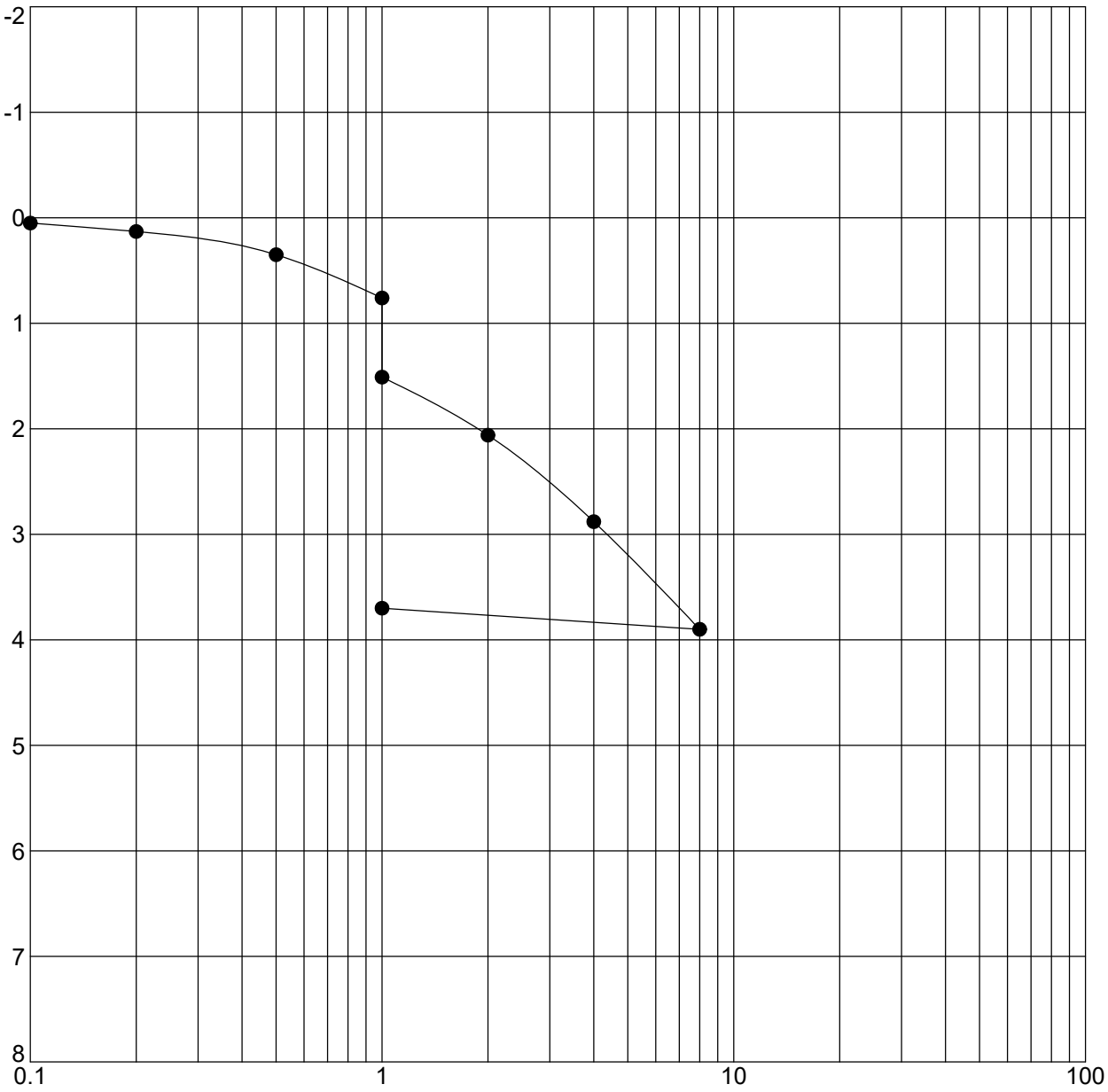
CONSOLIDATION TEST

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



Specimen Identification		Classification	γ_d	MC%
● B-1 5.0		**SANDY LEAN CLAY(CL)**	**97**	**24**

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Appendix F

Infiltration/Percolation Testing for Stormwater Retention

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017
Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: **Infiltration/Percolation Testing for Stormwater Retention**
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

As requested, we have performed percolation/infiltration testing on the subject site in order to determine the infiltration potential of the surface soils. The percolation rates determined should be useful in assessing stormwater retention needs. It is our understanding that on-site stormwater retention will be required. It is proposed to collect the stormwater runoff within subsurface percolation chambers. This report presents the results of our study, discussion of our findings, and provides percolation rates for the subject system.

PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to determine the general percolation rates and physical characteristics of the onsite soils in order to provide design parameters for the proposed onsite infiltration system. Services provided for this study are in accordance with our agreement and consisted of the following:

- Site exploration consisting of the excavation and logging of three test holes;
- Percolation testing in the test holes (P-1, P-2 and P-3);
- Compilation of this report, which presents the results of our study and provides percolation rates for the design of an onsite infiltration system.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The subject property is presently occupied by a vacant land. The project consists of construction of Gas Station, RV Fueling Station and associated improvements. Further information regarding proposed development and test hole locations is shown on Figure 1, Percolation Test Holes Location Map.

FIELD INVESTIGATION

Our field investigation consisted of excavating three shallow exploratory test holes, which were also used as percolation test holes. Hollow-stem drilled equipment was utilized to excavate the exploratory test holes. An engineer logged and observed the test holes excavations. Soil classification was based on visual observation. The approximate locations of the exploratory and

percolation test holes are shown on Figure 1 (Percolation Test Holes Location Map). Logs of the exploratory test holes are presented in Appendix A.

SUBSURFACE SOILS CONDITIONS

SOIL PROFILE

The soils encountered within our test holes consisted of native soil materials. Native soils encountered within the exploratory test holes consisted primarily of sandy clay and clay. A more detailed description of these materials is provided in the exploratory test holes logs included in the enclosed Appendix A. Soils encountered were classified according to the Unified Soil Classification System (USCS).

GROUNDWATER

Groundwater was not encountered within the exploratory test holes to the maximum explored depth of 5 feet below ground surface (bgs). Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

PERCOLATION TESTING AND PROCEDURE

Percolation testing was performed to assess the general percolation rates of the onsite soils for the design of an onsite infiltration system.

The continuous pre-soak (falling-head) test procedure was utilized for testing. Water was allowed to presoak in each test hole prior to obtaining test readings. Following the presoak period, the drop in water level in each hole was monitored every 10 to 30 minutes to determine the appropriate method for testing. Test holes were refilled following each reading or when the water depth was below 6 inches. Test times ranged from 120 to 150 minutes. The drop in water level was recorded to the nearest $1/10^{th}$ inch to produce conservative water level readings.

SUMMARY OF PERCOLATION TEST RESULTS

Tests results are summarized below:

Test Hole No.	Rate (Inch/Hour)
1	1.3
2	1.4
3	1.2

Based on the obtained field data, 1.2 inches per hour should be utilized in the design of the proposed onsite drain system. The base of the system should be founded into natural soils.

It should be noted that the infiltration rates determined are ultimate rates based upon field test results. An appropriate safety factor should be applied to account for subsoil inconsistencies and potential silting of the percolating soils. The safety factor should be determined with consideration to other factors in the stormwater retention system design (particularly stormwater volume estimates) and the safety factors associated with those design components.

The Storm water Manager's Resource Center (SMRC) web site (http://www.stormwatercenter.net/) includes guidelines for disposal of storm water with respect to setback of structures. It is included in the criteria that infiltration facilities should be setback 10 feet down-gradient from structures. In order to avoid potential adversely impacting any existing structures, we recommend that any infiltration system be kept a horizontal distance of at least 10 feet from the edge of new building and the property line.

LIMITATIONS

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering and engineering geologic principals and practice within our opinion at this time in Southern California. Our conclusions and recommendations are based on the results of the field investigations, combined with an interpolation of subsurface conditions between and beyond exploration locations.

As the project evolves, our continued consultation and construction monitoring should be considered. GeoBoden should review plans and specifications to ensure the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this study are valid. Where significant design changes occur, GeoBoden may be required to augment or modify these recommendations. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and/or modified recommendations. This report was written for Client, and the design team members, and only for the proposed development described herein. We are not responsible for technical interpretations made by others, or exploratory information that has not been described or documented in this report. Specific questions or interpretations concerning our findings and conclusions may require written clarification.

We appreciate the opportunity to provide service to you on this project. If you have questions regarding this letter or the data included, please contact the undersigned.

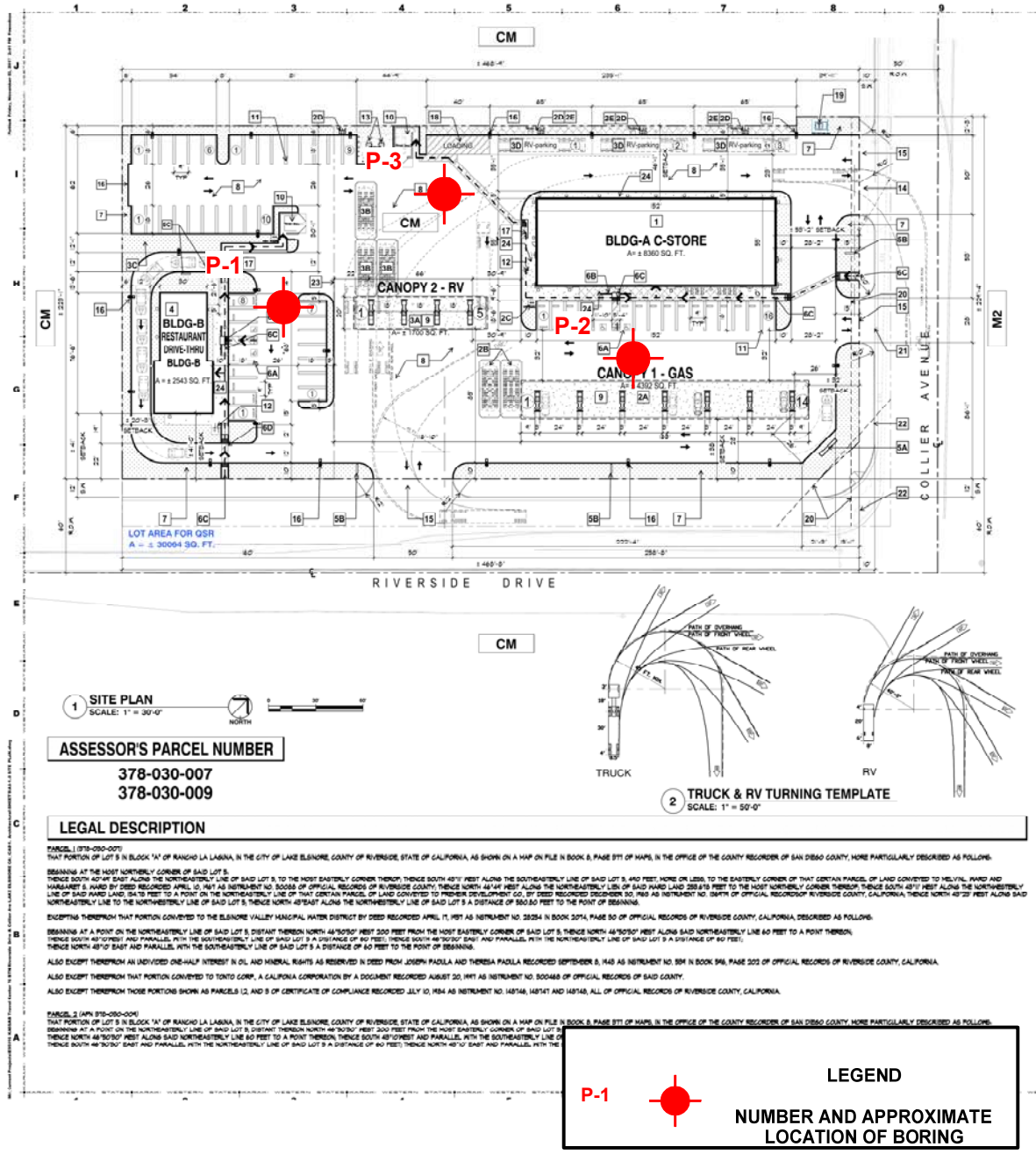
Sincerely,
GEOBODEN, INC.

Cyrus Radvar
Principal Engineer, G.E. 2742

Copies: 3/Addressee

Attachments:

Figure 1 – Percolation Test Holes Location Map
Appendix A – Test Holes Logs



ASSESSOR'S PARCEL NUMBER

378-030-007
378-030-009

LEGAL DESCRIPTION

PARCEL 1 (378-030-007)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 5;
THENCE SOUTH 40°49' EAST ALONG THE NORTHEASTERLY LINE OF SAID LOT 5, TO THE MOST EASTERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE SOUTHEASTERLY LINE OF SAID LOT 5, 440 FEET, MORE OR LESS, TO THE EASTERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO MELVIN L. WARD AND MARGARET S. WARD BY DEED RECORDED APRIL 10, 1961 AS INSTRUMENT NO. 30058 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY; THENCE NORTH 40°49' WEST ALONG THE NORTHEASTERLY LINE OF SAID WARD LAND, 284.78 FEET TO A POINT ON THE NORTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND CONVEYED TO PIONEER DEVELOPMENT CO., BY DEED RECORDED DECEMBER 30, 1960 AS INSTRUMENT NO. 138479 OF OFFICIAL RECORDSOF RIVERSIDE COUNTY, CALIFORNIA; THENCE NORTH 49°23' WEST ALONG SAID NORTHEASTERLY LINE TO THE NORTHWESTERLY LINE OF SAID LOT 5; THENCE NORTH 49°EAST ALONG THE NORTHWESTERLY LINE OF SAID LOT 5 A DISTANCE OF 550.50 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT BY DEED RECORDED APRIL 17, 1957 AS INSTRUMENT NO. 28254 IN BOOK 3074, PAGE 50 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5; THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON;
THENCE SOUTH 40°10'10" WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE NORTH 40°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN OIL AND MINERAL RIGHTS AS RESERVED IN DEED FROM JOSEPH PADILLA AND THERESA PADILLA RECORDED SEPTEMBER 8, 1948 AS INSTRUMENT NO. 594 IN BOOK 596, PAGE 202 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO TONTO CORP., A CALIFONIA CORPORATION BY A DOCUMENT RECORDED AUGUST 20, 1991 AS INSTRUMENT NO. 300468 OF OFFICIAL RECORDS OF SAID COUNTY.

ALSO EXCEPT THEREFROM THOSE PORTIONS SHOWN AS PARCELS 12, AND 9 OF CERTIFICATE OF COMPLIANCE RECORDED JULY 10, 1984 AS INSTRUMENT NO. 148746, 148747 AND 148748, ALL OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (APN 378-030-004)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5;
THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON; THENCE SOUTH 40°10' WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE
THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE NORTH 40°10' EAST AND PARALLEL WITH THE

P-1 — **LEGEND**

NUMBER AND APPROXIMATE LOCATION OF BORING

LEGEND

- NO. OF PARKING SPACES
- ACCESSIBLE PARKING
- PROPERTY LINE (BEFORE R.O.W. DEDICATION)
- PROPERTY LINE (AFTER R.O.W. DEDICATION)
- HANDICAP PATH OF TRAVEL
- CONCRETE PAVING AREA
- LANDSCAPED AREA
- DECORATIVE STAMPED CONCRETE
- WALL MOUNTED AREA LIGHTS
- DIRECTIONAL ARROW
- AREA LIGHTS
- (E) FIRE HYDRANT

SITE KEY NOTES

1 CONVENIENCE STORE
2A GAS STATION CANOPY AND FUEL DISPENSERS FOR AUTOS
2B UNDERGROUND STORAGE TANK
2C VENT RISER WITH CARBON CANISTER
2D AIR & WATER UNIT
2E TRASH BIN
3A GAS STATION CANOPY AND FUEL DISPENSERS OR R.V. & TRUCKS
3B UNDERGROUND STORAGE TANK
3C VENT RISER WITH CARBON CANISTER
3D RV PARKING W/ DUMP STATION
4 FASTFOOD WITH DRIVE-THRU
5A MONUMENT SIGN (UNDER SEPARATE PERMIT)
5B PRICE SIGN (UNDER SEPARATE PERMIT)
5C DRIVE THRU MENU BOARD SIGN
6A ACCESSIBLE PARKING (WITH WHEELCHAIR WHERE REQUIRED)
6B ACCESSIBLE PARKING SIGN
6C ADA ACCESSIBLE RAMP & TRUNCATED DOME PAVER
6D ADA ACCESSIBLE PATH STRIPING (2% MAX CROSS SLOPE)
7 LANDSCAPE WITH 6" CONCRETE CURB
8 ASPHALT PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
9 CONCRETE PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
10 TRASH ENCLOSURE (PER CITY STANDARD WHERE APPLICABLE)
11 PARKING STRIPING AS PER CITY STANDARDS (WITH WHEELCHAIR WHERE REQUIRED)
12 BIKE PARKING RACK
13 PROPANE TANK
14 (E) DRIVEWAY TO REMOVE, CONSTRUCT (N) SIDEWALK PER CITY STANDARDS
15 (N) DRIVEWAY PER CITY STANDARDS NO. 108A
16 AREA LIGHTS
17 SERVICE RAMP
18 SERVICE LOADING AREA
19 PROPOSED LOCATION OF TRANSFORMER
20 (E) WATER & TELEPHONE EASEMENT
21 (E) POWER POLE (TO BE RELOCATED PER CITY R.O.W. WIDENING)
22 (E) CURB, GUTTER & SIDEWALK (TO BE RELOCATED PER CITY R.O.W. WIDENING)
23 PROPOSED NEW PARCEL LINE FOR QSR WITH DRIVE-THRU
24 CONCRETE WALKWAY

VICINITY MAP

PROJECT DATA

ZONING	C-M (COMMERCIAL MANUFACTURING)	
LAND USE	COMMERCIAL	
AREA OF SITE	± 124,045 S.F. (± 2.85 ACRES) (BEFORE R.O.W. DEDICATION) ± 104,824 S.F. (± 2.34 ACRES) (AFTER R.O.W. DEDICATION)	
BLDG SETBACKS	REQUIRED	PROPOSED
FRONT	20'-0"	20'-0" / 41'-0"
REAR	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	46'-1"
SIDE (YARD)	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	20'-9"
SIDE (STREET)	15'-0"	52'-0" / 51'-0"
LANDSCAPE AREA	12%	16.45% (± 17,140 S.F.)
FLOOR AREA RATIO	-	0.152
LOT COVERAGE	-	18.2%
MAXIMUM HEIGHT	45'-0"	± 26'-0"
PARKING (SEE PARKING COMPUTATION BELOW)	64	75

BUILDING DATA

(N) BLDG-A CONVENIENCE STORE

AREA	± 8,360 SF
OCCUPANCY	M
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 26'-0"
FIRE SPRINKLER	YES

(N) BLDG CANOPY (FOR AUTOS)

AREA	± 4,312 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 18'-0"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG CANOPY (FOR R.V.s)

AREA	± 1,700 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 14'-8"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG-B FASTFOOD REATAURANT W/ DRIVE-THRU

AREA	± 2,543 SF
OCCUPANCY	A-2
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 22'-2"
FIRE SPRINKLER	NONE

PARKING ANALYSIS

PARKING STANDARDS

TYPE	SIZE
REGULAR	9'-0" X 18'-0"
PARALLEL	8'-0" X 23'-0"
HANDICAP	11'-0" X 18'-0" VAN ACCESSIBLE
LOADING	12'-0" X 40'-0" (TYPE-B)

PARKING REQUIREMENTS

USE	REQUIRED	PROPOSED
C-STORE (RETAIL AREA) (± 8,760 SF)	17	14 (4 CANOPIES)
FORMULA: 1 SP PER 400 SF (CM-DISTRICT)		
C-STORE (QSR AREA) (± 1,800 SF)	21	25
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		
FASTFOOD RESTAURANT	31	31
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		

HANDICAP PARKING REQUIREMENTS

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (3)		(4)

CLEAN AIR VEHICLE PARKING

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (6)		(6)

TOTAL PARKING SPACES	64	75

KARAKI WSe
WESTERN STATES ENGINEERING
A DESIGN-BUILD COMPANY
4667 E. LA PALMA STE. 707
TEL: (714)693-9300 FAX: (714)693-1002
CONSULTANT/ SEALS

SUBMITTAL
NO. DESCRIPTION BY DATE
1
2
3
4

REVISIONS
NO. DESCRIPTION BY DATE
△
△
△
△

OWNER NAME & ADDRESS
MR. RON KASSAB

PROJECT NAME & ADDRESS
THE KASSAB TRAVEL CENTER
Gas Station, RV Fueling Station
QSR w/ Drive-Thru
29301 RIVERSIDE DRIVE
LAKE ELSINORE CA 92530

NOTE TO CONTRACTOR

CONFIDENTIALITY STATEMENT

DESIGNED BY: WS
DRAWN BY: WS
CHECKED BY: JK
DATE DRAWN: 11.03.17
SCALE: 1" = 30'-0"
SHEET TITLE
SITE PLAN

BLDG SHEET NUMBER
AS-1.0
JOB No E95010
CUP No. CUP NO.

GEOBODEN INC. Geotechnical Consultants	PERCOLATION BORING LOCATION PLAN Proposed Kassab Travel Center 29301 Riverside Drive Lake Elsinore, California	Figure By S.R. Map No. XX Date 12-30-17 Project No. Lake Elsinore Figure No. 2

GEOBODEN, INC.

BORING NUMBER P-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER P-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER P-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): strong brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

Appendix G

Phase I Environmental Site Assessment

PHASE I ENVIRONMENTAL SITE ASSESSMENT
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA 92530

Prepared for:

Mr. Riyadh Kassab

4580 University Avenue

San Diego, CA 92105

Prepared by:

GEOROX ENGINEERING
622 Veneto
Irvine, California 92614

March, 11, 2016

JOB NO. E-1604

GEOROX ENGINEERING
Geotechnical and Environmental Consultants
622 Veneto, Irvine, CA 92614 T: 949-533-9059

March 11, 2016 Project No: E-1604

Mr. Riyadh Kassab
4580 University Avenue
San Diego, California 92105

Subject: Phase I Environmental Site Assessment
29301 Riverside Drive
Lake Elsinore, California 92530

Dear Mr. Kassab:

GeoRox Engineering is pleased to submit herewith our Phase I Environmental Site Assessment for the for the above referenced property. The assessment was performed utilizing applicable codes and standards. It has been a pleasure to be of service to you on this project. Should you have any questions, please do not hesitate to contact us.

Sincerely,

GEOROX ENGINEERING

Alex Shirazi, P.E.
Project Engineer

GeoRox Engineering
Geotechnical and Environmental Consultanting

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EXECUTIVE SUMMARY

This executive summary is a synopsis of findings based on our Phase I ESA. For detailed information regarding the findings, please refer to the text of our report.

Mr. Riyadh Kassab (Mr. Kassab) engaged GeoRox Engineering (GeoRox) to perform a Phase I Environmental Subject Property Assessment (ESA) for the vacant property located at 29301 Riverside Drive, Lake Elsinore, Riverside County, California (Subject Property).

The Subject Property is located in a mixed undeveloped and commercial area in the city of Lake Elsinore, California. The Subject Property consists of two parcels (APN 378030007 and 378030009) approximately 2.95 acres in size. The rectangular-shaped Subject Property is bounded to the northwest by undeveloped land followed by commercial/industrial development and Collier Avenue to the northeast, to the south by Riverside Drive, and to the east Collier Avenue/Riverside Drive Intersection, and to the west by undeveloped land.

According to aerial photographs, the Subject Property was historically developed with a water reservoir as early as 1938 to at least 1978, an unknown structure from as early as1978 to at least 1985, and was undeveloped from at least 1989 to present.

The Subject Property did not appear on current regulatory database lists that were reviewed during this assessment.

EZ Products, 17999 Collier Avenue, is located approximately 200 to the northwest of the Subject Property and is presumed to be higher elevation (hydrogically up/cross gradient). EZ Products is an active manufacturer of bolt, nut, screw, rivet, and washers. According to the regulatory database, this facility is listed as a RCRA-SQG, FINDS and ECHO site. Online research from the California DTSC Hazardous Waste Tracking System revealed evidence of tetrachloroethylene (PERC) on site for the years 1999 (1.48 tons), 2000 (0.34 tons), and 2001 (2.13 tons). According to the EPA ECHO website and the regulatory database, this facility specified a three-year period of no violations. Based on the inferred direction groundwater flow, the amount (over two tons) of PERC onsite for three years, and close proximity to the Subject Property, this facility represents an environmental issue. Based on the amount of PERC onsite (3.95 tons), inferred direction of groundwater flow, and relative distance from the Subject Property, this facility represents an environmental issue. Based on the lack of documented release, this site is not expected to represent an environmental concern to the Subject Property, at this time.

In our opinion, based on the information obtained during this assessment, additional subsurface soil sampling at the Subject Property (Phase-II ESA) is not recommended.

1.0 INTRODUCTION

Mr. Riyadh Kassab (Mr. Kassab) engaged GeoRox Engineering (GeoRox) to perform a Phase I Environmental Site Assessment (ESA) for the vacant property located at 29301 Riverside Drive, Lake Elsinore, Riverside County, California (Subject Property).

1.1 PURPOSE

The purpose of the Phase I ESA was to identify certain obvious environmental concerns arising from activities on the Subject Property or nearby properties. Activities of concern are those that may have contaminated, or have the potential to contaminate, the Subject Property's soil or ground water. The purpose of this assessment was not to determine the actual presence, degree, or extent of contamination, if any, on the Subject Property. Such a determination would require additional exploratory work.

The scope of services was performed in general accordance with ASTM Designation E 1527-13 *Standard Practice for Environmental Subject Property Assessments: Phase I Environmental Subject Property Assessment Process*. Any deviations to the ASTM E 1527-13 Standard can be found in Section 11.0. No significant assumptions were made during the assessment.

1.2 DETAILED SCOPE-OF-SERVICES

A Phase I ESA is intended to be a general characterization of selected environmental concerns. The characterization is based on readily ascertainable information and Subject Property observations. The assessment included the following services:

Geology/Hydrogeology

We reviewed selected available references regarding the local geology and hydrogeology to assist in assessing potential pathways of contaminant migration. We relied on sources such as United States Geological Survey topographic maps, ground-water reports, soils surveys, and geologic reports.

Subject Property and Area Reconnaissance

The objective of this reconnaissance was to identify obvious sources of contamination (actual and potential) at the Subject Property that could become environmental liabilities. We looked for signs of disturbances, stained soil, stressed vegetation, and other similar, obvious surficial evidence of potential contamination. The purpose of this work was not to determine the presence, degree, or extent of contamination at the Subject Property. This would require additional assessment including sampling and chemical analyses.

During the Subject Property reconnaissance, we looked for fluid-containing major electrical devices (e.g., transformers or capacitor banks) likely to contain polychlorinated biphenyls

(PCBs). The PCB status of these devices was noted based on labeling, and we made note of the general conditions of these devices, including evidence of leakage. We did not assess minor suspect PCB items such as fluorescent light fixture ballasts, or sample or test dielectric fluids.

During the Subject Property reconnaissance, we also looked for evidence of aboveground storage tanks (ASTs) and underground storage tanks (USTs) such as vent pipes, fill pipes, fuel dispensers, and other obvious evidence of ASTs and USTs.

We also conducted an area reconnaissance to assist in assessing if adjacent or nearby land uses may have contaminated the Subject Property. The area reconnaissance was conducted by touring the area by automobile and viewing particular businesses from public rights-of-way. Off-Subject Property properties were not entered.

Historical Review

We consulted selected references to infer past land uses on or near the Subject Property that might have contributed to soil or ground-water contamination at the Subject Property. We used the following types of references and information (depending on availability):

- Aerial photographs
- City directories
- Sanborn fire insurance maps
- Building permits
- Interviews with property management
- Information you provide
- Oil well maps, ground-water maps, and water well data

The period of concern is from the present, back to the Subject Property's first developed use (e.g., residential, commercial, or industrial), or back to any available time, whichever is earlier.

Regulatory Status Review

We reviewed excerpts of federal and state environmental regulatory agency lists for records regarding possible hazardous waste generation, transportation, treatment, storage, disposal, and release at the Subject Property or in the vicinity that may potentially threaten the Subject Property. The databases we reviewed include those indicated in the ASTM E 1527-05 standard, as well as selected local databases, as appropriate.

1.3 LIMITATIONS

The findings and opinions in this report are relevant to the dates of our Subject Property work and should not be relied on to represent conditions at substantially later dates. This report is prepared for the exclusive use of Mr. Kassab. Use of this report by any person or entity other than Mr. Kassab is expressly forbidden unless such other person or entity obtains written authorization from both Mr. Kassab and Georox. Use of this report by such other person or entity without the written authorization of Mr. Kassab and Georox will be at such other person's or entity's sole risk, and will be without legal exposure to Georox.

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable environmental consultants practicing in this or similar locations. This warranty is in lieu of all other warranties, expressed or implied.

The opinions included herein are based on information obtained during the study and our experience. If additional information becomes available, which might impact our environmental conclusions, we request the opportunity to review the information, reassess the potential concerns, and modify our opinion, if warranted. If this assessment included a review of reports prepared by other consultants, it must be recognized that Georox has no responsibility for the accuracy of information contained therein.

Although this assessment has attempted to identify the potential for contamination of the Subject Property, potential sources of contamination may have escaped detection due to: (1) the limited scope of this assessment, (2) the inaccuracy of public records, and (3) the presence of undetected and unreported environmental accidents.

2.0 SUBJECT PROPERTY DESCRIPTION

2.1 SUBJECT PROPERTY LOCATION

The Subject Property is located at 29301 Riverside Drive, Lake Elsinore, Riverside County, California (Subject Property). The Subject Property is depicted as developed with a water reservoir on the U.S. Geological Survey (USGS) Topographic Map *Lake Elsinore, California* Quadrangle (1988).

2.2 CURRENT USE OF THE SUBJECT PROPERTY

The subject property is currently a vacant, undeveloped land.

2.3 SUBJECT PROPERTY AND VICINITY CHARACTERISTICS

The Subject Property is located in a mixed undeveloped and commercial area in the city of Lake Elsinore, California. The Subject Property consists of two parcels (APN 378030007 and 378030009) approximately 2.95 acres in size. The rectangular-shaped Subject Property is bounded to the northwest by undeveloped land followed by commercial/industrial development and Collier Avenue to the northeast, to the south by Riverside Drive, and to the east Collier Avenue/Riverside Drive Intersection, and to the west by undeveloped land.

3.0 PHYSICAL SETTING

3.1 SURFACE DRAINAGE/FLOOD MAP

The Subject Property is situated at an elevation of approximately 1,268 feet above mean sea level (msl). Surface drainage (precipitation that does not infiltrate into the subsurface soils) follows the topographical gradient which is generally toward the south/southwest towards Lake Elsinore.

The subject property does not appear to be a designated wetland area, based on information obtained from the United States Department of Agriculture; however, a comprehensive wetlands survey would be required in order to formally determine actual wetlands on the subject property.

No surface impoundments, wetlands, natural catch basins, settling ponds, or lagoons were observed on the subject property. No drywells were observed on the subject property.

GEOROX performed a review of the Flood Insurance Rate Map, published by the Federal Emergency Management Agency. According to Community Panel Number 2028 of 3805 and Map Number 0605C2028G, dated August 28, 2008, the subject property appears to be located in Zone X, an area located outside of the 100-year and 500-year flood plains.

3.2 GEOLOGY

The Elsinore quadrangle is located in the northern part of the Peninsular Ranges Province and includes parts of two structural blocks, or structural subdivisions of the province. The active Elsinore Fault Zone diagonally crosses the southwest corner of the quadrangle, and is a major element of the right-lateral strike-slip San Andreas Fault system. The Elsinore Fault Zone separates the Santa Ana Mountains block west of the fault zone from the Perris block to the east. Internally both blocks are relatively stable and within the quadrangle are characterized by the presence of widespread erosional surfaces of low relief. Within the quadrangle the Santa Ana Mountains block is underlain by undifferentiated granitic rocks of the Cretaceous Peninsular Ranges batholith, but to the west, includes widespread pre-batholithic Mesozoic rocks.

The Perris block is underlain by a combination of batholithic and prebatholithic rocks, the latter consisting of metasedimentary rocks of low metamorphic grade; sub-greenschist grade. The most abundant lithology is phyllite but includes locally thick sections of impure quartzite. Minor sills, dikes, and small elongate plutons of fine-grained hornblende gabbro intrude the phyllite. Thin layers of tremolite-bearing marble occur locally. Also local are thin layers of manganese-bearing rocks. Both rhodonite and manganese oxides occur in these layers. The phyllite has a regular northwest strike throughout the main body of metamorphic rock giving rise to a homoclinal section over 25,000 feet thick. The layering-schistocity of these rocks is transposed bedding and is not stratigraphic thickness.

In the northwest corner of the quadrangle is a series of Cretaceous volcanic and associated sedimentary rocks in the northwest corner of the quadrangle contain widespread primary sedimentary structures and appear to post date the metamorphism of the phyllite. The volcanic rocks are part of the Estelle Mountain volcanics of primarily rhyolitic composition. The sedimentary rocks are well indurated, perhaps incipiently metamorphosed, siliceous rocks containing local conglomerate beds.

The Elsinore Groundwater Basin contains alluvial fan, floodplain, and lucustrine deposits, which are underlain by alluvium of the Pauba Formation. Alluvial fan deposits of gravel, sand, silt, and clay are found near the western and northeastern edges of the basin emanating from the adjacent crystalline mountains. The interior of the valley contains floodplain deposits that reach a thickness of about 200 feet and contain stringers of sand and gravel in finer silt and clay. In the zone of inundation of Lake Elsinore, finegrained lacustrine deposits of sand, silt, and clay reach 800 feet in thickness. The Pleistocene age Pauba Formation is a composed of alluvial sandstone and fanglomerate members (Morton and others 1999) that reach a maximum thickness of about 2,200 feet beneath lake Elsinore (DWR 1981). This is the principal water-bearing unit of the basin, with the most productive wells extracting from alluvial sand and gravel bodies that occur as stringers within less pervious silt- and clay–rich deposits. In general, sediments are coarser near the margins of the basin and become finer toward Lake Elsinore.

3.3 GROUNDWATER

The Elsinore Groundwater Basin underlies the Elsinore Valley in western Riverside County. The basin is bounded on the southwest by the Santa Ana and Elsinore Mountains along the Willard fault, a splay of the active Elsinore fault zone. The basin adjoins the Temecula Valley Groundwater Basin on the southeast at a low surface drainage divide. The basin is bounded on the northwest by the Temescal Subbasin of the Upper Santa Ana River Valley Groundwater Basin at a constriction in Temescal Wash. The basin is bounded on the northeast by nonwater-bearing rocks of the Peninsular Ranges along the Glen Ivy fault. Average annual precipitation ranges from 12 to 14 inches. Lake Elsinore lies in a closed basin formed between strands of the active Elsinore fault zone.

Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels. According to data from Geotracker website, a nearby gas station reported groundwater at 30 ft bgs and flows towards the south.

3.4 OIL AND GAS WELLS

Oil and gas wells are potential concerns when they seep oil or gas, are not abandoned to current regulations, or have associated surface contamination. They may also be associated with methane hazards. This section discusses the oil wells reported on the records we reviewed. Unreported "wildcat" oil wells could be on or near the Subject Property.

The Subject Property is not located within an Oilfield.

4.0 REVIEW OF PREVIOUS ENVIRONMENTAL REPORTS

Previous reports were not supplied to GeoRox from Mr. Kassab.

5.0 SUBJECT PROPERTY AND AREA RECONNAISANCE

5.1 METHODOLOGY AND LIMITING CONDITIONS

In performing the Subject Property and area reconnaissance, our assessor describes the Subject Property and looks for obvious signs of items that may be a source of environmental concern, such as aboveground storage tanks (ASTs); underground storage tanks (USTs), hazardous materials, and hazardous wastes.

Some of the items or activities we observe on the Subject Property may be associated with environmental concerns. Certain businesses or occupations may typically use hazardous substances or create hazardous waste. Storage tanks may leak and contaminate soil and ground water. Other signs of potential environmental concerns include unusual odors, pools of liquids, drums, unidentified containers, items that may contain polychlorinated biphenyls (PCBs), stains or corrosion, and drains or sumps.

Mr. Alex Shirazi performed the Subject Property visit and reconnaissance on March 5, 2016.

5.2 SUBJECT PROPERTY RECONNNAISSANCE

The Subject Property is located in a mixed undeveloped and commercial area in the city of Lake Elsinore, California. The Subject Property consists of two parcels (APN 378030007 and 378030009) approximately 2.95 acres in size. The rectangular-shaped Subject Property is bounded to the northwest by undeveloped land followed by commercial/industrial development and Collier Avenue to the northeast, to the south by Riverside Drive, and to the east Collier Avenue/Riverside Drive Intersection, and to the west by undeveloped land.

5.2.1 Interior Observations

The Subject Property is a vacant, undeveloped lot.

5.2.2 Aboveground and Underground Storage Tanks

No indications of USTs were observed during the Subject Property visit.

5.2.3 Hazardous Substances and Petroleum Products

No hazardous substances and/or petroleum products were observed on the Subject Property.

5.2.4 Solid Waste

No hazardous substances and/or petroleum products were observed on the Subject Property.

5.2.5 Electrical Transformers

Pad mounted and pole mounted transformers were observed on the Subject Property.

5.2.6 Wetlands

The subject property does not appear to be a designated wetland area, based on information obtained from the United States Department of Agriculture; however, a comprehensive wetlands survey would be required in order to formally determine actual wetlands on the subject property.

No surface impoundments, wetlands, natural catch basins, settling ponds, or lagoons were observed on the subject property. No drywells were observed on the subject property.

5.2.7 Wells and Mine Shafts

No mine shafts were observed on the Subject Property during the reconnaissance.

5.2.8 Pits, Ponds and Lagoons

Evidence of ponds, pits and lagoons were not observed on the Subject Property during the reconnaissance. Historic aerials and topographic maps indicate the Subject Property was improved with a water reservoir.

5.2.9 Effluent Discharge

Evidence of septic systems was not observed on the Subject Property.

5.2.10 Asbestos

The Subject Property is a vacant land.

5.2.11 Lead-Based Paint

The Subject Property is a vacant land.

5.2.12 Radon

According to EDR report and Radon Map of California, the site is located in Zone 2 of the USEPA's radon designation categories. Zone 2 indicates the expected radon concentration of the site is above 2.0 picoCuries per Liter (pCi/L) and less than 4.0 pCi/L. The EPA action level for radon is 4.0 pCi/L. Based on the future development (commercial nature) of the subject property, radon is not a concern.

5.2.13 Mold

The Subject Property is a vacant, undeveloped land.

5.2.14 Dry Cleaning

The Subject Property is a vacant, undeveloped land. No dry cleaners are located adjacent to the Subject Property.

5.2.15 Others

Other items that might be considered (RECs) relative to the Subject Property were not observed during the Subject Property reconnaissance.

5.3 AREA RECONNAISSANCE

The area reconnaissance helps us evaluate whether adjacent or nearby property uses may have contaminated the Subject Property. Our assessor conducted the reconnaissance by touring the area by automobile and viewing particular businesses from public rights of way, but did not enter off Subject Property properties. The findings of our area reconnaissance are discussed according to their direction from the Subject Property: north, east, south, and west.

5.3.1 North

The Subject Property is bound to the northwest by undeveloped land followed by a commercial/industrial warehouse (EZ Products) and Collier Avenue to the northeast.

5.3.2 South

The Subject Property is bound to the south by Riverside Drive and recently graded land beyond.

5.3.3 East

The Subject Property is bound to the east by Collier Avenue/Riverside Drive Intersection.

5.3.4 West

The Subject Property is bound by undeveloped land.

5.3.5 Summary of Area Reconnaissance

No environmentally sensitive tenants were located adjacent to the subject property.

6.0 INTERVIEWS

6.1 INTERVIEW WITH CURRENT SUBJECT PROPERTY TENANT

The Subject Property owner not available for interview.

7.0 HISTORICAL RECORDS REVIEW

As part of the historical review, we reviewed information on the past uses of the Subject Property and nearby properties. We assessed whether these uses may have contaminated the Subject Property's soil or ground water. The earliest historical references we typically consult date from 1940 or from the first developed use of the Subject Property or nearby properties. Information sources we commonly use include aerial photographs, fire insurance maps, and USGS topographic maps.

The historical review results in two histories, based on the information reviewed: a history of the past use of the Subject Property and a history of the past use of the adjacent properties.

7.1 HISTORICAL RESEARCH

7.1.1 Aerial Photographs

We reviewed available aerial photographs dated 1938, 1949, 1953, 1961, 1967, 1978, 1985, 1989, 1990, 1994, 2002, 2005, 2009, 2010, and 2012.

From 1938 to 1978, the Subject Property appears to be a water reservoir. However, from from at least 1978 to at least 1985, the Subject Property appears to be developed with an unknown square structure. From 1989 to 2012, the Subject Property appears to be native vegetation (undeveloped). The surrounding properties historically were utilized for agricultural purposes. In the mid 1980's the general area to the northwest and northeast appeared to be developed for commercial/industrial development. The properties to the west and south remain undeveloped in recent aerials.

7.1.2 Sanborn Maps

The Subject Property was un-impalpable according to the Sanborn fire insurance maps provided by EDR.

7.1.3 Topographic Maps

The United States Geological Survey (USGS) *Lake Elsinore, California* Quadrangle 7.5-minute series topographic map was reviewed for this ESA. According to the contour lines on the 1988 topographic map, the subject property is located at approximately 1268 feet above mean sea level (MSL). The contour lines in the area of the subject property indicate the area is sloping gently toward the south/southwest. The subject property is depicted as developed with a water reservoir.

An online review of historic topographic maps was conducted. The Subject Property appears to be developed with a water reservoir in 1953, 1954, 1970, 1975, 1982, 1985, and 1988.

7.1.4 City Directory

The EDR City Directory includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at approximate five year intervals.

Business directories including city, cross reference and telephone directories were reviewed at Sherman Library and Gardens, Newport Beach, California, for the years spanning 1985 through 2010.

The Subject Property address was not listed in the City Directory. The surrounding adjacent properties were not identified as sensitive environmental tenants.

7.2 AGENCIES CONTACTS

- City of Lake Elsinore: Building Department, Planning Division, Fire Department, Online GIS mapping
- County of Riverside, Online Assessor Database
- Riverside County Health Department, Records Request: response has yet to be received.
- South Coast Air Quality Management District, Online records search: no records on file for the Subject Property
- California Department of Toxic Substances and Control, Envirostor Online Database: no records on file for the Subject Property.
- California State Water Board, Geotracker Online Database, no records on file for the Subject Property.

8.0 REGULATORY AGENCY INFORMATION

We reviewed excerpts of federal, state, and local environmental regulatory agency lists for those properties which were within the search ranges as noted in the excerpts that were prepared by EDR, an environmental data search firm. EDR revises their lists periodically when they receive updates from the agencies. The date of the latest revision is shown on their report, which is appended to this report as Appendix B. The EDR with Geocheck report also summarizes the origin and purpose of each list.

Please note that regulatory listings are limited and include only those sites that are known to the regulatory agencies at the time of publication to be contaminated or in the process of evaluation for potential contamination. Our scope of services did not include an on-site review of agency files.

Regulatory Database	Search Distance	On-site listings	Adj. Property Listings	Total Within Search Distance
Fed. NPL	1-mile	0	0	0
Fed. Proposed NPL	1-mile	0	0	0
Fed. Delisted NPL	½-mile	0	0	0
Fed. CERCLIS	½-mile	0	0	0
Fed. CERCLIS-NFRAP	½-mile	0	0	0
Fed. RCRA CORRACTS	1-mile	0	0	0
Fed. RCRA TSD	½-mile	0	0	0
Fed. RCRA Gen.	¼ -mile	0	1	0
US Eng. Controls	½-mile	0	0	0
US Inst. Controls	½-mile	0	0	0
Fed. ERNS	SP	0	--	--
State RESPONSE	1-mile	0	0	0

Regulatory Database	Search Distance	On-site listings	Adj. Property Listings	Total Within Search Distance
State ENVIROSTOR	1-mile	0	0	2
State & Tribal equiv. NPL and CERCLIS	1-mile	0	0	0
State & Tribal SWF/LF	½-mile	0	0	0
State & Tribal LUST	½-mile	0	0	0
State SLIC	½-mile	0	0	0
State & Tribal UST	¼ -mile	0	0	3
State & Tribal AST	¼ -mile	0	0	0
State & Tribal VCP	½-mile	0	0	0
US Brownfields	½-mile	0	0	0
SWRCY	½-mile	0	0	1
HAULERS	Site	0	--	--
HIST AUTO	1-mile	0	0	1

Three sites (nine listings total) are listed within 1-mile radius of the Subject Property. Two of the sites are not considered an environmental concern to the Subject Property based on the nature of the listings, inferred direction of groundwater flow and relative distance. The adjacent site is detailed below:

- EZ Products, 17999 Collier Avenue, is located approximately 200 to the northwest of the Subject Property and is presumed to be higher elevation (hydrogically up/cross gradient). EZ Products is an active manufacturer of bolt, nut, screw, rivet, and washers. According to the regulatory database, this facility is listed as a RCRA-SQG, FINDS and ECHO site. Online research from the California DTSC Hazardous Waste Tracking System revealed evidence of tetrachloroethylene (PERC) on site for the years 1999 (1.48 tons), 2000 (0.34 tons), and 2001 (2.13 tons). According to the EPA

ECHO website and the regulatory database, this facility specified a three-year period of no violations. Based on the inferred direction groundwater flow, the amount (over two tons) of PERC onsite for three years, and close proximity to the Subject Property, this facility represents an environmental issue. Based on the amount of PERC onsite, Inferred direction of groundwater flow, and relative distance from the Subject Property, this facility represents an environmental issue. Based on the lack of documented release, this site is not expected to represent an environmental concern to the Subject Property, at this time.

9.0 USER PROVIDED INFORMATION

9.1 OWNER, PROPERTY MANAGER, AND OCCUPANT

A Representative of the Subject Property Owner completed the Phase I ESA User Questionnaire. No environmentally sensitive information related to the subject property was identified. The completed questionnaire is attached in Appendix D.

The property is currently represented by DSGS and C. and M. Smyrniotos.

9.2 REASON FOR PERFORMING *PHASE I*

This Phase I Environmental Subject Property Assessment was performed as part of the due diligence process associated with the proposed commercial development of the Subject Property.

10.0 DEVIATIONS

10.1 DATA GAPS

No data gaps were identified during this assessment.

11.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

A *recognized environmental condition* (REC) refers to the presence or likely presence of any hazardous substance or petroleum product on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term REC includes hazardous substances and petroleum products even under conditions that might be in compliance with laws. The term is not intended to include "de minimis" conditions that do not present a threat to human health and/or the environment and that would not be subject to an enforcement action if brought to the attention of appropriate governmental agencies. The following was identified during the course of this assessment:

- GeoRox did not identify any RECs during the course of this assessment.

A controlled recognized environmental condition (CREC) refers to a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls. The following was identified during the course of this assessment:

- GeoRox did not identify any CRECs during the course of this assessment.

A historical recognized environmental condition (HREC) refers to an environmental condition which would have been considered a REC in the past, but which is no longer considered a REC based on subsequent assessment or regulatory closure. The following was identified during the course of this assessment:

- GeoRox did not identify any HRECs during the course of this assessment.

An environmental issue refers to environmental concerns identified by GeoRox, which do not qualify as RECs; however, require discussion. The following was identified during the course of this assessment:

GeoRox did identify one *environmental issues* during the course of this assessment and is detailed below:

- EZ Products, 17999 Collier Avenue, is located approximately 200 to the northwest of the Subject Property and is presumed to be higher elevation (hydrogically up/cross gradient). EZ Products is an active manufacturer of bolt, nut, screw, rivet, and washers. According to the regulatory database, this facility is listed as a RCRA-SQG, FINDS and ECHO site. Online research from the California DTSC Hazardous Waste Tracking System revealed evidence of tetrachloroethylene (PERC) on site for the years 1999 (1.48 tons), 2000 (0.34 tons), and 2001 (2.13 tons). According to the EPA ECHO website and the regulatory

database, this facility specified a three-year period of no violations. Based on the inferred direction groundwater flow, the amount (over two tons) of PERC onsite for three years, and close proximity to the Subject Property, this facility represents an environmental issue. Based on the amount of PERC onsite (3.95 tons), inferred direction of groundwater flow, and relative distance from the Subject Property, this facility represents an environmental issue. Based on the lack of documented release, this site is not expected to represent an environmental concern to the Subject Property, at this time.

In our opinion, based on the information obtained during this assessment, additional subsurface soil sampling at the Subject Property (Phase-II ESA) is not recommended.

12.0 LIMITATIONS AND EXCEPTIONS

The findings and opinions in this report are relevant to the dates of our Subject Property work. They should not be relied upon to represent conditions at later dates.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at the time of service. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The opinions included in this report are based on information obtained during the study and on our experience. If additional information becomes available that might affect our conclusions, we request the opportunity to review the information, reassess the potential environmental concerns, and modify our opinion, if warranted.

Although this assessment has attempted to identify the potential for Subject Property contamination, potential sources of contamination may have escaped detection. They may have been overlooked because of the limited scope of this assessment, the inaccuracy of public records, or the presence of undetected and unreported environmental concerns.

12.1 SIGNIFICANT ASSUMPTIONS

We assume the purpose of the Phase I ESA is to provide appropriate inquiry into the previous/current ownership and use of the Subject Property so that Mr. Kassab may qualify for CERCLA liability protection. Additionally, we assume that the information gathered and reviewed during this assessment is accurate.

12.1.1 Special Terms and Conditions

No special terms or conditions were made during the assessment.

12.1.2 User Reliance

This report has been prepared for Mr. Kassab to be used solely in evaluating potential environmental implications at the Subject Property. The report has not been prepared for use by other parties, and may not contain sufficient information for purposes of other parties or other uses. If other parties wish to rely on this report, a secondary Mr. Kassab agreement must be signed.

13.0 SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S)

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental professional as defined in §312.10 of 40 CFR 312.

Alex Shirazi, P.E.
Principal Engineer

We have the specific qualifications based on education, training, and experience to assess a property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

FIGURES

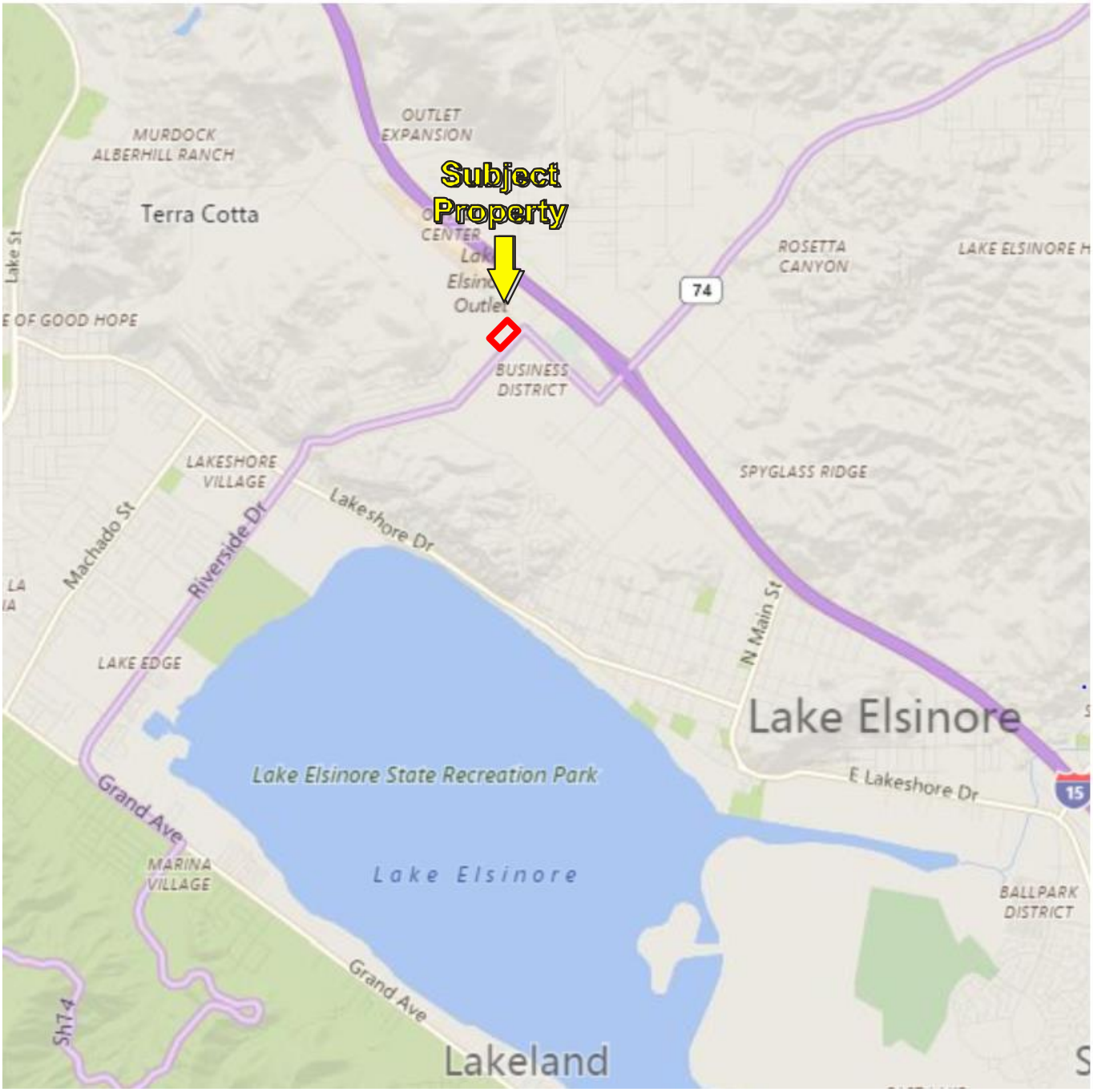
Subject Property Vicinity Map

Subject Property Site Plan

NORTH

Figure 2
Subject Property Site Plan
29301 Riverside Drive, Lake Elsinore, CA
Project No.: E-1604

GeoRox Engineering
Geotechnical and Environmental Consultanting



NORTH

Figure 1
Subject Property Vicinity Map
Vacant Lot – Lake Elsinore
Project No.: E-1604

GeoRox Engineering
Geotechnical and Environmental Consultanting

APPENDIX A

SUBJECT PROPERTY PHOTOGRAPHS

1: View of the Subject Property looking west

2: View of the Subject Property looking north

3: View of adjacent intersection to the east (Collier Avenue and Riverside Drive)

4: View of Subject Property and adjacent property to the northeast

APPENDIX B

THE EDR-RADIUS REPORT

Vacant Lot - Lake Elsinore
18181 Collier Ave
Lake Elsinore, CA 92530

Inquiry Number: 4551235.3
March 01, 2016

Certified Sanborn® Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

3/01/16

Site Name:
Vacant Lot - Lake Elsinore
18181 Collier Ave
Lake Elsinore, CA 92530

Client Name:
Geo Rox Engineering
622 Veneto
Irvine, CA 92614-0000

EDR Inquiry # 4551235.3

Contact: Alex

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Geo Rox Engineering were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Site Name: Vacant Lot - Lake Elsinore
Address: 18181 Collier Ave
City, State, Zip: Lake Elsinore, CA 92530
Cross Street:
P.O. # NA
Project: E-1604
Certification # 35F5-4409-AF6D

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results
Certification # 35F5-4409-AF6D

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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E-1604 Lake Elsinore
Collier Avenue
Lake Elsinore, CA 92530

Inquiry Number: 4552616.2s
March 02, 2016

The EDR Radius Map™ Report with GeoCheck®

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Thank you for your business.
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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

COLLIER AVENUE
LAKE ELSINORE, CA 92530

COORDINATES

Latitude (North):	33.6949200 - 33° 41' 41.71''
Longitude (West):	117.3468940 - 117° 20' 48.81''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	467850.2
UTM Y (Meters):	3728190.8
Elevation:	1268 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5636473 LAKE ELSINORE, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20120519
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
COLLIER AVENUE
LAKE ELSINORE, CA 92530

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	E Z PRODUCTS	17999 COLLIER AVE	RCRA-SQG, FINDS, ECHO	Higher	187, 0.035, ENE
A2	CANS PLUS RECYCLING	29170 RIVERSIDE DR U	SWRCY, NPDES	Higher	643, 0.122, NE
A3		29170 RIVERSIDE DR	EDR Hist Auto	Higher	643, 0.122, NE
B4	MBC CONTRUCTION LTD	29400 INDUSTRIAL CEN	SWEEPS UST, CA FID UST	Higher	1163, 0.220, SE
B5	MBC CONSTRUCTORS LTD	29400 ENTERPRISE WY	UST	Higher	1172, 0.222, SE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

EXECUTIVE SUMMARY

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ---------- State Response Sites

State- and tribal - equivalent CERCLIS

ENVIROSTOR ---------- EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

LUST ---------- Geotracker's Leaking Underground Fuel Tank Report
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
SLIC ---------- Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
AST ---------- Aboveground Petroleum Storage Tank Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

VCP ---------- Voluntary Cleanup Program Properties
INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ---------- Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ---------- Waste Management Unit Database
HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
ODI ---------- Open Dump Inventory
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- National Clandestine Laboratory Register

HIST Cal-Sites ---- Historical Calsites Database
SCH ---- School Property Evaluation Program
CDL ---- Clandestine Drug Labs
Toxic Pits ---- Toxic Pits Cleanup Act Sites
US CDL ---- Clandestine Drug Labs

Local Lists of Registered Storage Tanks

HIST UST ---- Hazardous Substance Storage Container Database

Local Land Records

LIENS ---- Environmental Liens Listing
LIENS 2 ---- CERCLA Lien Information
DEED ---- Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ---- Hazardous Materials Information Reporting System
CHMIRS ---- California Hazardous Material Incident Report System
LDS ---- Land Disposal Sites Listing
MCS ---- Military Cleanup Sites Listing
SPILLS 90 ---- SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ---- RCRA - Non Generators / No Longer Regulated
FUDS ---- Formerly Used Defense Sites
DOD ---- Department of Defense Sites
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---- Financial Assurance Information
EPA WATCH LIST ---- EPA WATCH LIST
2020 COR ACTION ---- 2020 Corrective Action Program List
TSCA ---- Toxic Substances Control Act
TRIS ---- Toxic Chemical Release Inventory System
SSTS ---- Section 7 Tracking Systems
ROD ---- Records Of Decision
RMP ---- Risk Management Plans
RAATS ---- RCRA Administrative Action Tracking System
PRP ---- Potentially Responsible Parties
PADS ---- PCB Activity Database System
ICIS ---- Integrated Compliance Information System
FTTS ---- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---- Material Licensing Tracking System
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---- PCB Transformer Registration Database
RADINFO ---- Radiation Information Database
HIST FTTS ---- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---- Incident and Accident Data
CONSENT ---- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---- Indian Reservations
FUSRAP ---- Formerly Utilized Sites Remedial Action Program
UMTRA ---- Uranium Mill Tailings Sites

LEAD SMELTERS ---- Lead Smelter Sites
US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File
FINDS ---- Facility Index System/Facility Registry System
CA BOND EXP. PLAN ---- Bond Expenditure Plan
Cortese ---- "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings ---- CUPA Resources List
DRYCLEANERS ---- Cleaner Facilities
EMI ---- Emissions Inventory Data
ENF ---- Enforcement Action Listing
Financial Assurance ---- Financial Assurance Information Listing
HAZNET ---- Facility and Manifest Data
HIST CORTESE ---- Hazardous Waste & Substance Site List
HWP ---- EnviroStor Permitted Facilities Listing
HWT ---- Registered Hazardous Waste Transporter Database
MINES ---- Mines Site Location Listing
MWMP ---- Medical Waste Management Program Listing
NPDES ---- NPDES Permits Listing
PEST LIC ---- Pesticide Regulation Licenses Listing
PROC ---- Certified Processors Database
Notify 65 ---- Proposition 65 Records
UIC ---- UIC Listing
WASTEWATER PITS ---- Oil Wastewater Pits Listing
WDS ---- Waste Discharge System
WIP ---- Well Investigation Program Case List
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
ECHO ---- Enforcement & Compliance History Information

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants
EDR Hist Cleaner ---- EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---- Recovered Government Archive Solid Waste Facilities List
RGA LUST ---- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 06/09/2015 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
E Z PRODUCTS	***17999 COLLIER AVE***	***ENE 0 - 1/8 (0.035 mi.)***	***1***	***8***

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 12/14/2015 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MBC CONSTRUCTORS LTD Facility Id: 455	29400 ENTERPRISE WY	SE 1/8 - 1/4 (0.222 mi.)	B5	17

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 12/14/2015 has revealed that there is 1 SWRCY site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CANS PLUS RECYCLING Cert Id: RC5256	***29170 RIVERSIDE DR U***	***NE 0 - 1/8 (0.122 mi.)***	***A2***	***12***

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MBC CONTRUCTION LTD	***29400 INDUSTRIAL CEN***	***SE 1/8 - 1/4 (0.220 mi.)***	***B4***	***16***
Status: A Tank Status: A Comp Number: 34795				

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MBC CONTRUCTION LTD	***29400 INDUSTRIAL CEN***	***SE 1/8 - 1/4 (0.220 mi.)***	***B4***	***16***
Facility Id: 33007000 Status: A				

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there is 1 EDR Hist Auto site within approximately 0.125 miles of the target property.

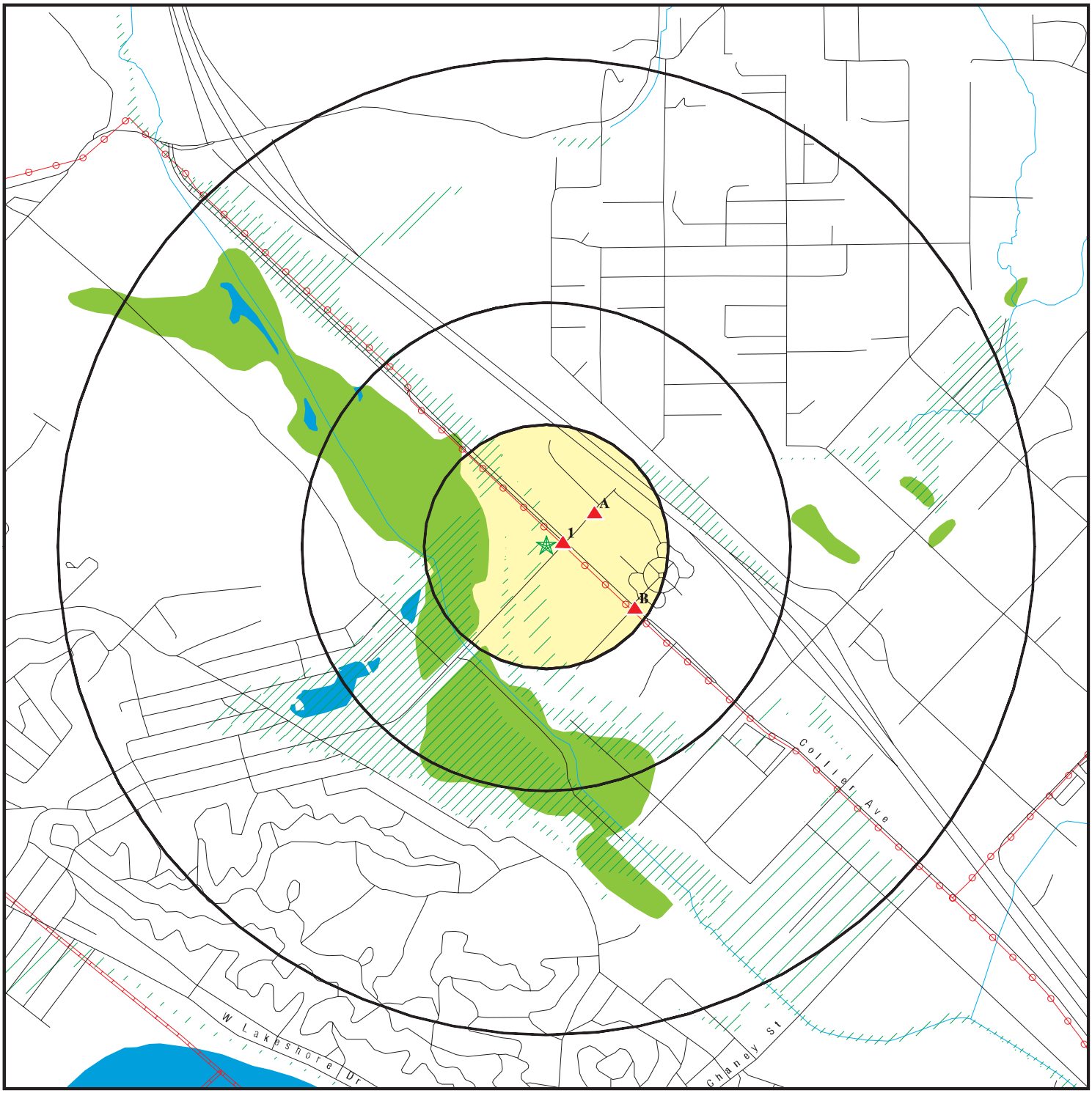
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	29170 RIVERSIDE DR	NE 0 - 1/8 (0.122 mi.)	A3	15

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 5 records.

Site Name	Database(s)
LAKE ELSINORE SQUARE	NPDES
PAC BELL	SWEEPS UST
	CDL
LOS PINOS CONSERVATION CAMP	UST
SO CAL GAS/ELSINORE MGP	ENVIROSTOR, VCP

OVERVIEW MAP - 4552616.2S



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: E-1604 Lake Elsinore ADDRESS: Collier Avenue Lake Elsinore CA 92530 LAT/LONG: 33.69492 / 117.346894	CLIENT: Geo Rox Engineering CONTACT: Alex INQUIRY #: 4552616.2s DATE: March 02, 2016 2:01 pm

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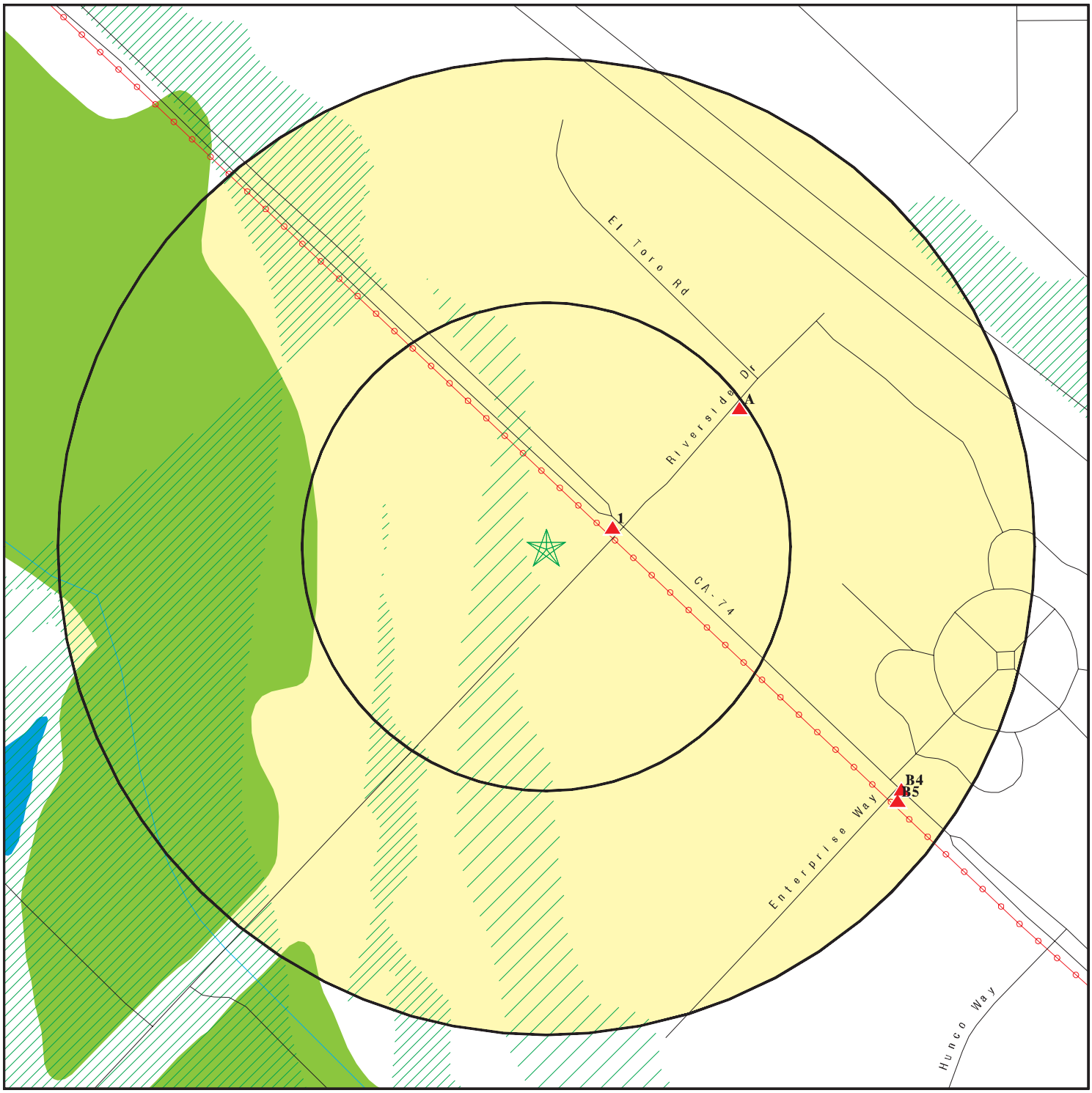
DETAIL MAP - 4552616.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

0 1/16 1/8 1/4 Miles

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: E-1604 Lake Elsinore ADDRESS: Collier Avenue Lake Elsinore CA 92530 LAT/LONG: 33.69492 / 117.346894	CLIENT: Geo Rox Engineering CONTACT: Alex INQUIRY #: 4552616.2s DATE: March 02, 2016 2:02 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
CERCLIS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERCLIS-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		1	0	NR	NR	NR	1
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	1	NR	NR	NR	1
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		1	0	0	NR	NR	1
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	1	NR	NR	NR	1
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	TP		NR	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		1	NR	NR	NR	NR	1
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	3	3	0	0	0	6

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
ENE
< 1/8
0.035 mi.
187 ft.

E Z PRODUCTS
17999 COLLIER AVE
LAKE ELSINORE, CA 92530

RCRA-SQG
FINDS
ECHO

1000128777
CAD981615784

Relative:
Higher

Actual:
1271 ft.

RCRA-SQG:

Date form received by agency:	04/17/2000
Facility name:	E Z PRODUCTS
Facility address:	17999 COLLIER AVE LAKE ELSINORE, CA 92530
EPA ID:	CAD981615784
Contact:	MITCH NELSON
Contact address:	17999 COLLIER AVE LAKE ELSINORE, CA 92530
Contact country:	US
Contact telephone:	(909) 674-7781
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	E Z PRODUCTS CO
Owner/operator address:	17999 COLLIER AVE LAKE ELSINORE, CA 92530
Owner/operator country:	Not reported
Owner/operator telephone:	(909) 674-7781
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No

E Z PRODUCTS (Continued) **1000128777**

User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D000
. Waste name: Not Defined

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

Historical Generators:
Date form received by agency: 09/01/1996
Site name: E Z PRODUCTS
Classification: Small Quantity Generator

Violation Status: No violations found

FINDS:

Registry ID: 110002725141

Environmental Interest/Information System
California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:

Envid:	1000128777
Registry ID:	110002725141
FIPS Code:	06065
EPA Region:	09
Indian Country Flag:	N
Federal Flag:	Not reported
US Mexico Border Flag:	N
Chesapeake Bay Flag:	Not reported
NAA Flag:	Y
Latitude:	33.69529
Longitude:	-117.34766
Map Icon:	RCRA-IC-MN-N.png
Collection Method:	ADDRESS MATCHING-HOUSE NUMBER
Reference Point:	CENTER OF A FACILITY OR STATION
Accuracy Meters:	30
Derived Tribes:	Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation, California - 21.4 mile(s), Soboba Band of Luiseno Indians, California - 24.8 mile(s)
Derived Huc:	18070203

E Z PRODUCTS (Continued) **1000128777**

Derived WBD:	Not reported
Derived STCT FPS:	06065
Derived Zip:	92530
Derived CD113:	42
Derived CB2010:	060650430052017
Percent Minority:	64.572
Pop Den:	1539.76
Major Flag:	Not reported
Active Flag:	Y
MYRTK Universe:	NNN
Inspection Count:	0
Date Last Inspection:	Not reported
Days Last Inspection:	Not reported
Informal Count:	0
Date Last Informal Action:	Not reported
Formal Action Count:	0
Date Last Formal Action:	Not reported
Total Penalties:	0
Penalty Count:	0
Date Last Penalty:	Not reported
Last Penalty Amount:	Not reported
QTRS in NC:	0
Programs in SNC:	0
Curr Compliance Status:	No Violation
Curr SNC Flag:	N
3yr Compliance Status:	_____
AFS Flag:	N
NPDES Flag:	N
SDWIS Flag:	N
RCRA Flag:	Y
TRI Flag:	N
GHG Flag:	N
AFS IDS:	Not reported
CAA Permit Types:	Not reported
CAA NAICS:	Not reported
CAA SICS:	Not reported
CAA Evaluation Count:	Not reported
CAA Days Last Evaluation:	Not reported
CAA Informal Count:	Not reported
CAA Formal Action Count:	Not reported
CAA Date Last Formal Action:	Not reported
CAA Penalties:	Not reported
CAA Last Penality Date:	Not reported
CAA Last Penality Amount:	Not reported
CAA Qtrs in NC:	Not reported
CAA Curr Compliance Status:	Not reported
CAA Curr HPV Flag:	N
CAA 3yr Compl Qtrs Status:	Not reported
NPDES IDS:	Not reported
CWA Permit Types:	Not reported
CWA Compliance Tracking:	Not reported
CWA NAICS:	Not reported
CWA SICS:	Not reported
CWA Inspection Count:	Not reported
CWA Days Last Inspection:	Not reported
CWA Informal Count:	Not reported
CWA Formal Action Count:	Not reported

E Z PRODUCTS (Continued) **1000128777**

CWA Date Last Formal Action:	Not reported
CWA Penalties:	Not reported
CWA Last Penality Date:	Not reported
CWA Last Penality Amount:	Not reported
CWA Qtrs in NC:	Not reported
CWA Curr Compliance Status:	Not reported
CWA Curr SNC Flag:	N
CWA 13QTRS Compl Status:	Not reported
CWA 13QTRS EFFLNT Exceedances:	Not reported
CWA 3tr QNCR Codes:	Not reported
RCRA IDS:	CAD981615784
RCRA Permit Types:	SQG
RCRA NAICS:	Not reported
RCRA Inspection Count:	Not reported
RCRA Days Last Evaluation:	Not reported
RCRA Informal Count:	Not reported
RCRA Formal Action Count:	Not reported
RCRA Date Last Formal Action:	Not reported
RCRA Penalties:	Not reported
RCRA Last Penality Date:	Not reported
RCRA Last Penality Amount:	Not reported
RCRA QTRS in NC:	0
RCRA Curr Compliance Status:	No Violation
RCRA Curr SNC Flag:	N
RCRA 3yr Compl Qtrs Status:	_____
SDWA IDS:	Not reported
SDWA System Types:	Not reported
SDWA Informal Count:	Not reported
SDWA Formal Action Count:	Not reported
SDWA Curr Compliance Status:	Not reported
SDWA Curr SNC Flag:	N
TRI IDS:	Not reported
TRI Releases Transfers:	Not reported
TRI on Site Releases:	Not reported
Tri off Site Transfers:	Not reported
TRI Reporter in Past:	Not reported
FEC Case IDS:	Not reported
FEC Number of Cases:	Not reported
FEC Last Case Date:	Not reported
FEC Total Penalties:	Not reported
GHG IDS:	Not reported
GHG CO2 Release:	Not reported
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110002725141
Facility SIC Codes:	Not reported
Facility NAICS Codes:	Not reported
Facility Date Last Inspection EPA:	Not reported
Facility Date Last Inspection State:	Not reported
Facility Date Last Formal ACT EPA:	Not reported
Facility Date Last Formal ACT ST:	Not reported
Facility Date Last Inforamal ACT EPA:	Not reported
Facility Date Last Informal ACT ST:	Not reported
Facility Federal Agency:	Not reported
TRI Reporter:	Not reported
Facility IMP Water Flag:	Not reported

A2
NE
< 1/8
0.122 mi.
643 ft.

CANS PLUS RECYCLING
29170 RIVERSIDE DR UNIT 1
LAKE ELSINORE, CA 92530

Site 1 of 2 in cluster A

SWRCY S110656511
NPDES N/A

Relative:
Higher

Actual:
1278 ft.

SWRCY:

Reg Id:	18819
Cert Id:	RC5256
Mailing Address:	29170 Riverside Dr Unit 1
Mailing City:	Lake Elsinore
Mailing State:	CA
Mailing Zip Code:	92530
Website:	Not reported
Email:	Not reported
Phone Number:	Not reported
Grand Father:	N
Rural:	N
Operation Begin Date:	03/24/1993
Aluminium:	Y
Glass:	Y
Plastic:	Y
Bimetal:	Y
Agency:	N/A
Monday Hours Of Operation:	8:30 am - 4:45 pm
Tuesday Hours Of Operation:	8:30 am - 4:45 pm
Wednesday Hours Of Operation:	8:30 am - 4:45 pm
Thursday Hours Of Operation:	8:30 am - 4:45 pm
Friday Hours Of Operation:	8:30 am - 4:45 pm
Saturday Hours Of Operation:	9:00 am - 2:45 pm
Sunday Hours Of Operation:	CLOSED
Organization ID:	18819
Organization Name:	Cans Plus Recycling

NPDES:

Npdes Number:	CAS000001
Facility Status:	Active
Agency Id:	0
Region:	8
Regulatory Measure Id:	445159
Order No:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	8 33I024750
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	03/24/2014
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Cans Plus Recycling
Discharge Address:	29170 Riverside Drive Unit 1
Discharge City:	Lake Elsinore
Discharge State:	California
Discharge Zip:	92530
RECEIVED DATE:	Not reported
PROCESSED DATE:	Not reported
STATUS CODE NAME:	Not reported
STATUS DATE:	Not reported
PLACE SIZE:	Not reported

CANS PLUS RECYCLING (Continued) **S110656511**

PLACE SIZE UNIT:	Not reported
FACILITY CONTACT NAME:	Not reported
FACILITY CONTACT TITLE:	Not reported
FACILITY CONTACT PHONE:	Not reported
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	Not reported
OPERATOR NAME:	Not reported
OPERATOR ADDRESS:	Not reported
OPERATOR CITY:	Not reported
OPERATOR STATE:	Not reported
OPERATOR ZIP:	Not reported
OPERATOR CONTACT NAME:	Not reported
OPERATOR CONTACT TITLE:	Not reported
OPERATOR CONTACT PHONE:	Not reported
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	Not reported
OPERATOR TYPE:	Not reported
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	Not reported
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	Not reported
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported
CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	Not reported
RECEIVING WATER NAME:	Not reported
CERTIFIER NAME:	Not reported
CERTIFIER TITLE:	Not reported
CERTIFICATION DATE:	Not reported
PRIMARY SIC:	Not reported
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported
Npdes Number:	Not reported
Facility Status:	Not reported
Agency Id:	Not reported
Region:	8
Regulatory Measure Id:	445159

CANS PLUS RECYCLING (Continued) **S110656511**

Order No:	Not reported
Regulatory Measure Type:	Industrial
Place Id:	Not reported
WDID:	8 33I024750
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
RECEIVED DATE:	3/24/2014
PROCESSED DATE:	3/24/2014
STATUS CODE NAME:	Active
STATUS DATE:	3/24/2014
PLACE SIZE:	16700
PLACE SIZE UNIT:	SqFt
FACILITY CONTACT NAME:	Larry Amsbry
FACILITY CONTACT TITLE:	Owner
FACILITY CONTACT PHONE:	951-245-1178
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	cansplusrecycling@yahoo.com
OPERATOR NAME:	Cans Plus Recycling
OPERATOR ADDRESS:	29170 Riverside Drive Unit 1
OPERATOR CITY:	Lake Elsinore
OPERATOR STATE:	California
OPERATOR ZIP:	92530
OPERATOR CONTACT NAME:	Robert Amsbry
OPERATOR CONTACT TITLE:	Manager
OPERATOR CONTACT PHONE:	951-245-1178
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	cansplusrecycling@yahoo.com
OPERATOR TYPE:	Private Business
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	California
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	Not reported
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported

CANS PLUS RECYCLING (Continued) **S110656511**

CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	N
RECEIVING WATER NAME:	Lake Elsinore
CERTIFIER NAME:	Robert Amsbry
CERTIFIER TITLE:	Manager
CERTIFICATION DATE:	30-JAN-15
PRIMARY SIC:	5093-Scrap and Waste Materials
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported

A3 **EDR Hist Auto** **1015393886**
NE **29170 RIVERSIDE DR** **N/A**
< 1/8 **LAKE ELSINORE, CA 92530**
0.122 mi.
643 ft. **Site 2 of 2 in cluster A**

Relative:
Higher

Actual:
1278 ft.

EDR Historical Auto Stations:

Name:	LEOS AUTO BODY
Year:	1999
Address:	29170 RIVERSIDE DR
Name:	LEOS AUTO BODY
Year:	2000
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2007
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2008
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2009
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2010
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2011
Address:	29170 RIVERSIDE DR
Name:	ADVANCED AUTO CARE
Year:	2012
Address:	29170 RIVERSIDE DR

B4 **MBC CONTRUCTION LTD** **SWEEPS UST** **S101590309**
SE **29400 INDUSTRIAL CENTER WAY** **CA FID UST** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92330**
0.220 mi.
1163 ft. **Site 1 of 2 in cluster B**

Relative:
Higher

Actual:
1278 ft.

SWEEPS UST:

Status:	Active
Comp Number:	34795
Number:	1
Board Of Equalization:	44-018185
Referral Date:	11-17-92
Action Date:	11-17-92
Created Date:	03-09-89
Owner Tank Id:	001190
SWRCB Tank Id:	33-000-034795-000001
Tank Status:	A
Capacity:	4000
Active Date:	11-17-92
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	2

Status:	Active
Comp Number:	34795
Number:	1
Board Of Equalization:	44-018185
Referral Date:	11-17-92
Action Date:	11-17-92
Created Date:	03-09-89
Owner Tank Id:	001190
SWRCB Tank Id:	33-000-034795-000002
Tank Status:	A
Capacity:	8000
Active Date:	11-17-92
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	Not reported

CA FID UST:

Facility ID:	33007000
Regulated By:	UTNKA
Regulated ID:	Not reported
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	7146748787
Mail To:	Not reported
Mailing Address:	29400 INDUSTRIAL CENTER WAY
Mailing Address 2:	Not reported
Mailing City,St,Zip:	LAKE ELSINORE 92330
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

B5 **MBC CONSTRUCTORS LTD** **UST** **U003739355**
SE **29400 ENTERPRISE WY** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92530**
0.222 mi.
1172 ft. **Site 2 of 2 in cluster B**

Relative:
Higher

Actual:
1277 ft.

UST:

Facility ID:	455
Permitting Agency:	RIVERSIDE COUNTY
Latitude:	33.6920974
Longitude:	-117.3447503

Count: 5 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
DANBY	S106930254	PAC BELL	25 MILES E OF AMBOY HWY 66	92532	SWEEPS UST
ELSINORE	S100714908	SO CAL GAS/ELSINORE MGP	CNR RILEY, FLINT, SPRING & POT	92530	ENVIROSTOR, VCP
LAKE ELSINORE	S107535310		609 COLLIER AVENUE	92350	CDL
LAKE ELSINORE	S117703449	LAKE ELSINORE SQUARE	NEC OF COLLIER AVE & CENTRAL A	92530	NPDES
LAKE ELSINORE	U004050576	LOS PINOS CONSERVATION CAMP	32951 ORTEGA HWY	92530	UST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: EPA
Telephone: N/A
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 03/26/2015
Date Data Arrived at EDR: 04/08/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/06/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2015
Date Data Arrived at EDR: 05/29/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 13

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 09/11/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 53

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 06/22/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/29/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 11/18/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 64

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/17/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 11/04/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/08/2015
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 02/09/2015
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 03/30/2015
Date Data Arrived at EDR: 04/28/2015
Date Made Active in Reports: 06/22/2015
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 08/20/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 111

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 34

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/27/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

UST: Active UST Facilities

Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities

A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 08/20/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 111

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/05/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 34

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 12/14/2014
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 28

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/28/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 12/04/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/22/2015
Date Data Arrived at EDR: 12/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/21/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 58

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/14/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/17/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 76
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 11/07/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs
A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 8
Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/17/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 76

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/01/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 11/25/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 16

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 12/17/2015
Date Data Arrived at EDR: 12/22/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/08/2015
Next Scheduled EDR Contact: 12/21/2015
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/02/2015
Number of Days to Update: 68

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/30/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 09/25/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 11/16/2015
Number of Days to Update: 20

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/27/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/09/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/11/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/01/2015
Date Data Arrived at EDR: 09/03/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/09/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/12/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/12/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 110

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/11/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2015
Date Data Arrived at EDR: 08/26/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 02/12/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 33

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/12/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/26/2015
Date Data Arrived at EDR: 07/10/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 95
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/13/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/11/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/29/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/07/2015
Date Data Arrived at EDR: 07/09/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/07/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/02/2015
Number of Days to Update: 46

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/26/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 86

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/26/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 12/22/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 12/22/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2015
Date Data Arrived at EDR: 09/01/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 125

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/03/2015
Next Scheduled EDR Contact: 03/14/2016
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/14/2016
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/14/2016
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/20/2015
Date Data Arrived at EDR: 09/09/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 55

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/10/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/28/2015
Date Data Arrived at EDR: 12/29/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 23

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/29/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/10/2015
Date Data Arrived at EDR: 08/27/2015
Date Made Active in Reports: 10/01/2015
Number of Days to Update: 35

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 02/05/2016
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 09/25/2015
Date Made Active in Reports: 11/05/2015
Number of Days to Update: 41

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 59

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 59

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 10/14/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 58

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 58

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/13/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 01/13/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Varies

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 11/10/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/08/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 11/18/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/17/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 44

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 12/08/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 03/01/2016
Number of Days to Update: 75

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 01/05/2016
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 38

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 07/23/2015
Date Data Arrived at EDR: 09/15/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 28

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/18/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing

Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Varies

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 06/16/2016
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/23/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 86

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/24/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/20/2015
Date Data Arrived at EDR: 09/23/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 103

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 12/21/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/12/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 41

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/14/2016
Date Made Active in Reports: 03/01/2016
Number of Days to Update: 47

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 12/10/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 42

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 11/20/2014
Date Data Arrived at EDR: 11/24/2014
Date Made Active in Reports: 01/07/2015
Number of Days to Update: 44

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing

Cupa Facility Listing

Date of Government Version: 02/02/2016
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 18

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/28/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/08/2015
Date Data Arrived at EDR: 09/22/2015
Date Made Active in Reports: 10/14/2015
Number of Days to Update: 22

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 12/01/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 48

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 11/16/2015
Date Data Arrived at EDR: 11/17/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 24

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/30/2015
Date Data Arrived at EDR: 12/03/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 49

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 01/05/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 45

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 01/04/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 12/02/2015
Date Data Arrived at EDR: 12/04/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 48

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 01/25/2016
Date Data Arrived at EDR: 01/27/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 26

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 05/19/2015
Date Data Arrived at EDR: 06/18/2015
Date Made Active in Reports: 07/22/2015
Number of Days to Update: 34

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/19/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 18

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2016
Date Data Arrived at EDR: 01/26/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 27

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 11/24/2014
Date Data Arrived at EDR: 01/30/2015
Date Made Active in Reports: 03/04/2015
Number of Days to Update: 33

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/08/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/19/2015
Date Data Arrived at EDR: 10/20/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 30

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/20/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2015
Date Data Arrived at EDR: 07/27/2015
Date Made Active in Reports: 08/10/2015
Number of Days to Update: 14

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/15/2015
Date Data Arrived at EDR: 01/29/2015
Date Made Active in Reports: 03/10/2015
Number of Days to Update: 40

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 02/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 03/30/2015
Date Data Arrived at EDR: 04/02/2015
Date Made Active in Reports: 04/13/2015
Number of Days to Update: 11

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 02/16/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 11/04/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/12/2016
Date Data Arrived at EDR: 01/15/2016
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 24

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 09/15/2015
Date Data Arrived at EDR: 09/17/2015
Date Made Active in Reports: 10/14/2015
Number of Days to Update: 27

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 10/05/2015
Date Data Arrived at EDR: 10/08/2015
Date Made Active in Reports: 10/15/2015
Number of Days to Update: 7

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/18/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 34

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 11/24/2015
Date Data Arrived at EDR: 12/01/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 51

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 12/10/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 60

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 01/27/2016
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 18

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 11/01/2015
Date Data Arrived at EDR: 11/17/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 65

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/09/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 08/03/2015
Date Data Arrived at EDR: 08/10/2015
Date Made Active in Reports: 09/11/2015
Number of Days to Update: 32

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/09/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/01/2015
Date Data Arrived at EDR: 11/11/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 36

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/10/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 12/11/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 41

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/26/2015
Date Data Arrived at EDR: 10/28/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 22

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/26/2015
Date Data Arrived at EDR: 10/28/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 22

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List

List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 01/05/2016
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 38

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 01/05/2016
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 38

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/05/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/18/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 52

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 12/18/2015
Date Data Arrived at EDR: 12/22/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 48
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 04/04/2016
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/10/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 42
Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/21/2016
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 10/14/2015
Date Data Arrived at EDR: 10/15/2015
Date Made Active in Reports: 11/16/2015
Number of Days to Update: 32

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/14/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Annually

Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 12/14/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/10/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing

CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List

Cupa facility list

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 17

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/29/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/17/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 59

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 02/08/2016
Next Scheduled EDR Contact: 05/23/2016
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 11/18/2015
Date Data Arrived at EDR: 11/23/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 18

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 12/09/2015
Date Data Arrived at EDR: 12/10/2015
Date Made Active in Reports: 01/21/2016
Number of Days to Update: 42

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 09/10/2015
Next Scheduled EDR Contact: 12/28/2015
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 10/30/2015
Date Data Arrived at EDR: 12/14/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 56

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/10/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 01/11/2016
Date Data Arrived at EDR: 01/14/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 39

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 01/11/2016
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 01/05/2016
Date Data Arrived at EDR: 01/07/2016
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 32

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/23/2015
Next Scheduled EDR Contact: 04/11/2016
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 12/07/2015
Date Data Arrived at EDR: 12/08/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 9

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 12/04/2015
Next Scheduled EDR Contact: 03/21/2016
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 10/29/2015
Date Data Arrived at EDR: 10/30/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 42

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 08/17/2015
Date Made Active in Reports: 09/03/2015
Number of Days to Update: 17

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/30/2015
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/14/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 09/28/2015
Date Data Arrived at EDR: 10/28/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 22

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/25/2016
Next Scheduled EDR Contact: 05/09/2016
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 11/30/2015
Date Data Arrived at EDR: 12/17/2015
Date Made Active in Reports: 02/08/2016
Number of Days to Update: 53

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/17/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 10/19/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 11/19/2015
Number of Days to Update: 23

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 04/18/2016
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 02/01/2016
Date Data Arrived at EDR: 02/05/2016
Date Made Active in Reports: 02/22/2016
Number of Days to Update: 17

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 02/01/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/18/2016
Next Scheduled EDR Contact: 05/30/2016
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/17/2015
Date Made Active in Reports: 08/12/2015
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/15/2016
Next Scheduled EDR Contact: 04/25/2016
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/02/2015
Date Data Arrived at EDR: 11/08/2015
Date Made Active in Reports: 12/09/2015
Number of Days to Update: 31

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/03/2016
Next Scheduled EDR Contact: 05/16/2016
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/24/2015
Date Made Active in Reports: 08/18/2015
Number of Days to Update: 25

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/19/2016
Next Scheduled EDR Contact: 05/02/2016
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/22/2016
Next Scheduled EDR Contact: 06/06/2016
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 03/19/2015
Date Made Active in Reports: 04/07/2015
Number of Days to Update: 19

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/09/2015
Next Scheduled EDR Contact: 03/28/2016
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

E-1604 LAKE ELSINORE
COLLIER AVENUE
LAKE ELSINORE, CA 92530

TARGET PROPERTY COORDINATES

Latitude (North):	33.69492 - 33° 41' 41.71''
Longitude (West):	117.346894 - 117° 20' 48.82''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	467850.2
UTM Y (Meters):	3728190.8
Elevation:	1268 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5636473 LAKE ELSINORE, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

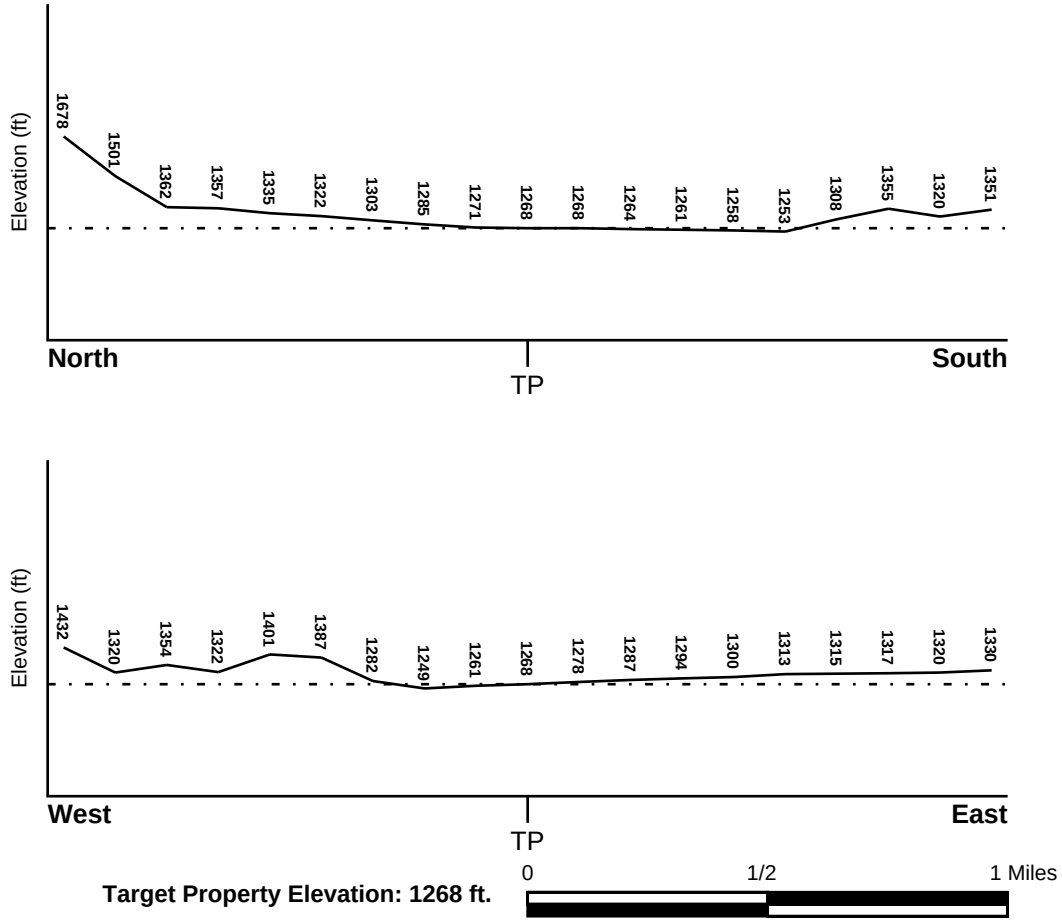
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1268 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
RIVERSIDE, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: 06065C - FEMA DFIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

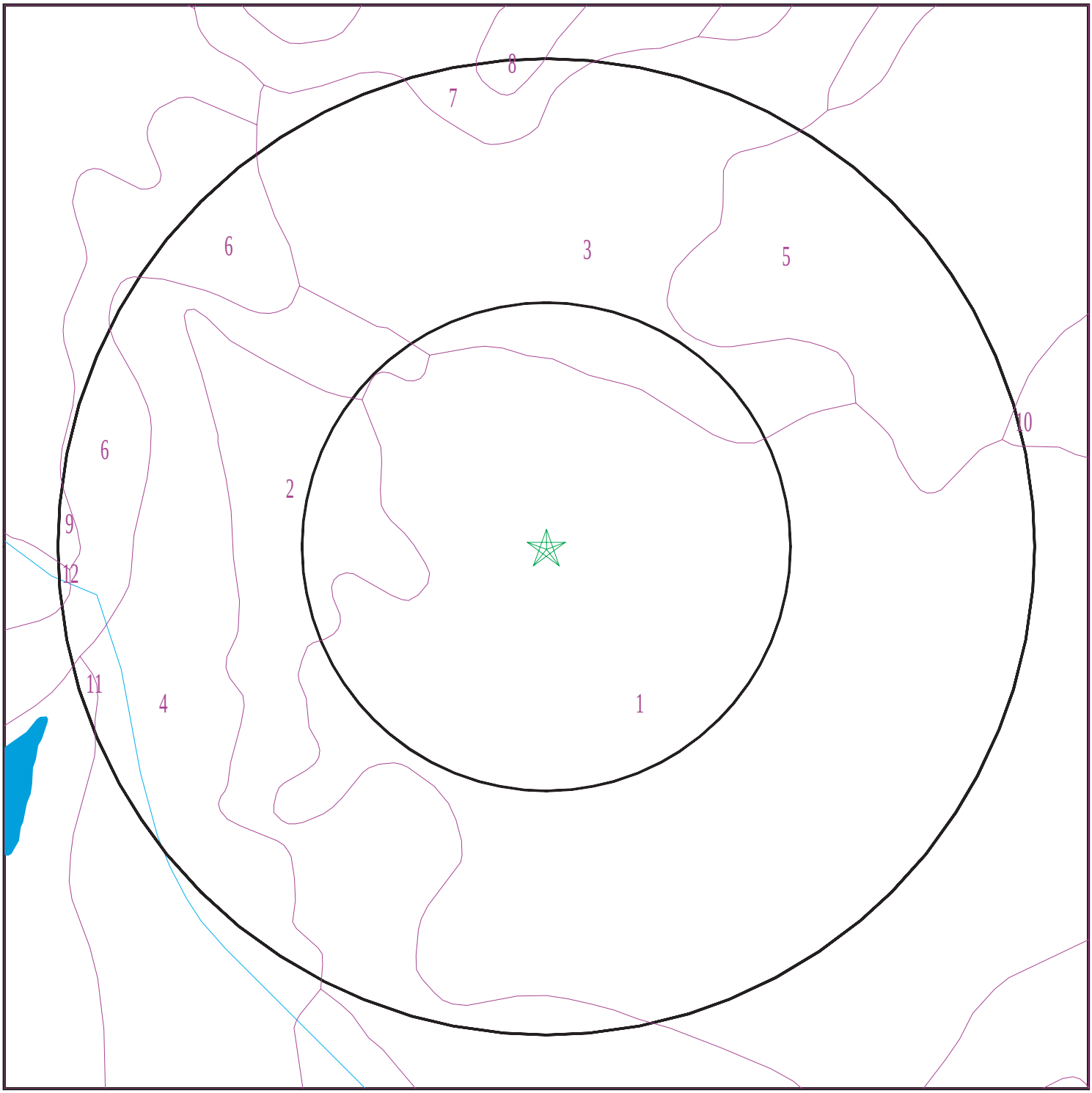
Era:	Mesozoic
System:	Lower Jurassic and Upper Triassic
Series:	Lower Mesozoic
Code:	lMze *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 4552616.2s



SITE NAME:	E-1604 Lake Elsinore	CLIENT:	Geo Rox Engineering
ADDRESS:	Collier Avenue	CONTACT:	Alex
	Lake Elsinore CA 92530	INQUIRY #:	4552616.2s
LAT/LONG:	33.69492 / 117.346894	DATE:	March 02, 2016 2:03 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: GARRETSON

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	59 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.8 Min: 6.1

Soil Map ID: 2

Soil Component Name: PACHAPPA

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.8 Min: 6.1
2	20 inches	62 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.6

Soil Map ID: 3

Soil Component Name: GARRETSON

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	59 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.1

Soil Map ID: 4

Soil Component Name: TRAVER

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 9 Min: 7.4
2	12 inches	38 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4
3	38 inches	59 inches	stratified fine sandy loam to silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4

Soil Map ID: 5

Soil Component Name: ARBUCKLE

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	11 inches	25 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	25 inches	44 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
4	44 inches	68 inches	stratified sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 6

Soil Component Name: TRAVER

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 9 Min: 7.4
2	12 inches	38 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4
3	38 inches	59 inches	stratified fine sandy loam to silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4

Soil Map ID: 7

Soil Component Name: ARBUCKLE

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	25 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	25 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	44 inches	68 inches	stratified very gravelly sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 8

Soil Component Name: ARBUCKLE

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	25 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	25 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	44 inches	68 inches	stratified very gravelly sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 9

Soil Component Name: WILLOWS

Soil Surface Texture: silty clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.42 Min: 0.01	Max: 9 Min: 7.4
2	9 inches	59 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.42 Min: 0.01	Max: 9 Min: 8.5

Soil Map ID: 10

Soil Component Name: ARBUCKLE

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 5.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	25 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	25 inches	44 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
4	44 inches	68 inches	stratified sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 11

Soil Component Name: TRAVER

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 9 Min: 7.4
2	20 inches	59 inches	stratified fine sandy loam to silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 9.6 Min: 8.4

Soil Map ID: 12

Soil Component Name: ALTAMONT

Soil Surface Texture: cobbly clay

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	cobbly clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 7.8 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	18 inches	22 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
3	22 inches	27 inches	weathered bedrock	Not reported	Not reported	Max: 4 Min: 1.4	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

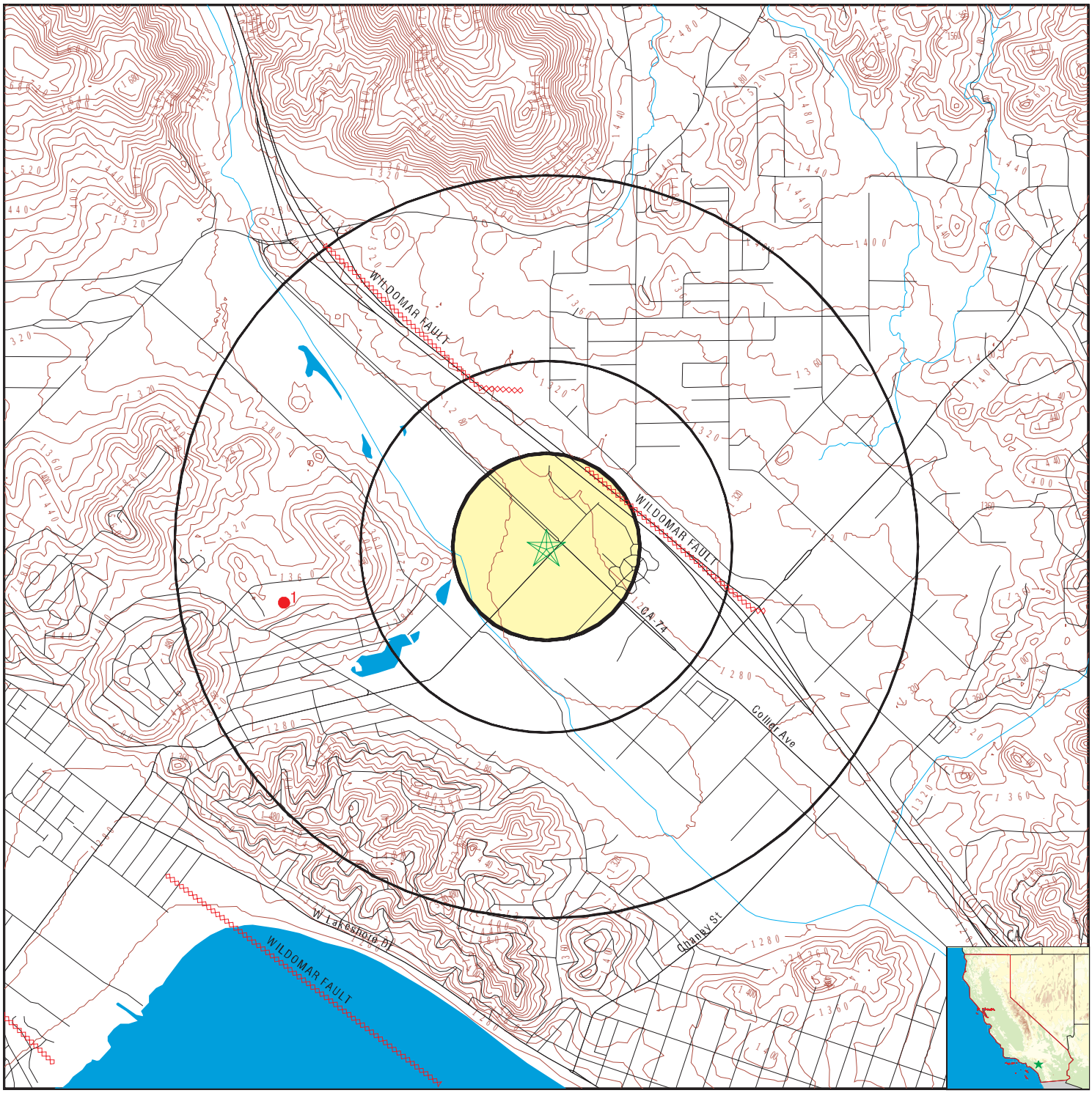
MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CAOG11000222706	1/2 - 1 Mile WSW

PHYSICAL SETTING SOURCE MAP - 4552616.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME: E-1604 Lake Elsinore	CLIENT: Geo Rox Engineering
ADDRESS: Collier Avenue Lake Elsinore CA 92530	CONTACT: Alex
LAT/LONG: 33.69492 / 117.346894	INQUIRY #: 4552616.2s DATE: March 02, 2016 2:03 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1
WSW **OIL_GAS** **CAOG11000222706**
1/2 - 1 Mile

District nun:	1	Api number:	06500093
Blm well:	N	Redrill can:	Not Reported
Dryhole:	Y	Well status:	P
Operator name:	Great Coastal Oil Corp.		
County name:	Riverside	Fieldname:	Any Field
Area name:	Any Area	Section:	36
Township:	05S	Range:	05W
Base meridian:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Not Reported	Wellnumber:	1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	Not Reported
Welldeptha:	0		
Redrillfoo:	0		
Abandonedd:	Not Reported	Completion:	Not Reported
Directiona:	Unknown	Gissymbol:	PDH
Site id:	CAOG11000222706		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92530	6	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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Fax To: Geo Rox Engineering
Contact: Alex
Fax : 949-533-9059
Date: 03/02/2016

Fax From: Robert Glaze
EDR
Phone: 1-800-352-0050

EDR PUR-IQ® Report

"the intelligent way to conduct historical research"

for
E-1604 Lake Elsinore
Collier Avenue
Lake Elsinore, CA 92530
Lat./Long. 33.69492 / 117.346894
EDR Inquiry # 4552616.2s

The EDR PUR-IQ report facilitates historical research planning required to complete the Phase I ESA process. The report identifies the *likelihood* of prior use coverage by searching proprietary EDR-Prior Use Reports® comprising nationwide information on: city directories, fire insurance maps, aerial photographs, historical topographic maps, flood maps and National Wetland Inventory maps.

Potential for EDR Historical (Prior Use) Coverage - Coverage in the following historical information sources may be used as a guide to develop your historical research strategy:

1. City Directory: Coverage may exist for portions of Riverside County, CA.

2. Fire Insurance Map: When you order online any EDR Package or the EDR Radius Map with EDR Sanborn Map Search/Print, you receive site specific Sanborn Map coverage information at no charge.

3. Aerial Photograph: Coverage exists for portions of Riverside County for the following decades: 1930s, 1980s, 1960s, 1950s, 1990s Shipping time 3-5 business days.

4. Topographic Map: The USGS 7.5 min. quad topo sheet(s) associated with this site:

Historical: Coverage exists for RIVERSIDE County

Current: Target Property: TP | 2012 | 5636473 Lake Elsinore, CA

5. Flood Insurance Rate Maps (FEMA) : Coverage is available for RIVERSIDE county.

EDR's network of professional researchers, located throughout the United States, accesses the most extensive national collections of city directory, fire insurance maps, aerial photographs, flood maps and historical topographic map resources available for Lake Elsinore, CA. These collections may be located in multiple libraries throughout the country. To ensure maximum coverage, EDR will often assign researchers at these multiple locations on your behalf. Please call or fax your EDR representative to authorize a search.

EDR - HISTORICAL SOURCE(S) ORDER FORM

Geo Rox Engineering
Alex
Account # 7013183

E-1604 Lake Elsinore
Collier Avenue
Lake Elsinore, CA 92530
RIVERSIDE County
Lat./Long. 33.69492 / 117.346894
EDR Inquiry # 4552616.2s

Should you wish to change or add to your order, fax this form to your EDR account executive:

Robert Glaze
Ph: 1-800-352-0050 Fax: 1-800-231-6802

Reports

___ EDR Sanborn Map® Search/Print

___ EDR Fire Insurance Map Abstract

___ EDR Multi-Tenant Retail Facility® Report

___ EDR City Directory Abstract

___ EDR Aerial Photo Decade Package

___ USGS Aerial 5 Package

___ USGS Aerial 3 Package

___ EDR Historical Topographic Maps

___ Paper Current USGS Topo (7.5 min.)

___ Environmental Lien Search

___ Chain of Title Search

___ NJ MacRaes Industrial Directory Report

___ EDR Telephone Interview

Shipping:

___ Email
___ Express, Next Day Delivery — RUSH SERVICE IS AVAILABLE
___ Express, Second Day Delivery
___ Express, Next day Delivery — Customer Account — Acct # _____
___ Express, Second Day Delivery — Customer Account — Acct # _____
___ U.S. Mail

Thank you

APPENDIX C

THE EDR-AERIAL REPORT

Vacant Lot - Lake Elsinore
Collier Ave
Lake Elsinore, CA 92530

Inquiry Number: 4551235.5
March 01, 2016

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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Thank you for your business.
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with any questions or comments.

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Date EDR Searched Historical Sources:

Aerial Photography March 01, 2016

Target Property:

Collier Ave

Lake Elsinore, CA 92530

Year	***Scale***	***Details***	***Source***
1938	Aerial Photograph. Scale: 1"=500'	Flight Year: 1938	USGS
1949	Aerial Photograph. Scale: 1"=500'	Flight Year: 1949	USGS
1953	Aerial Photograph. Scale: 1"=500'	Flight Year: 1953	USGS
1961	Aerial Photograph. Scale: 1"=500'	Flight Year: 1961	USGS
1967	Aerial Photograph. Scale: 1"=500'	Flight Year: 1967	USGS
1978	Aerial Photograph. Scale: 1"=500'	Flight Year: 1978	USGS
1985	Aerial Photograph. Scale: 1"=500'	Flight Year: 1985	USGS
1989	Aerial Photograph. Scale: 1"=500'	Flight Year: 1989	USGS
1990	Aerial Photograph. Scale: 1"=500'	Flight Year: 1990	USGS
1994	Aerial Photograph. Scale: 1"=500'	/DOQQ - acquisition dates: 1994	USGS/DOQQ
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	USDA/NAIP
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	USDA/NAIP
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	USDA/NAIP
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	USDA/NAIP

INQUIRY #: 4551235.5
YEAR: 1938
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1949
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1953
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1961
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1967
= 500'
N
EDR

INQUIRY #: 4551235.5

YEAR: 1978

N

EDR

= 500'

INQUIRY #: 4551235.5
YEAR: 1985
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1989
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1990
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 1994
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 2005
= 500'
N
EDR

INQUIRY #: 4551235.5
YEAR: 2009
= 500'
N
EDR

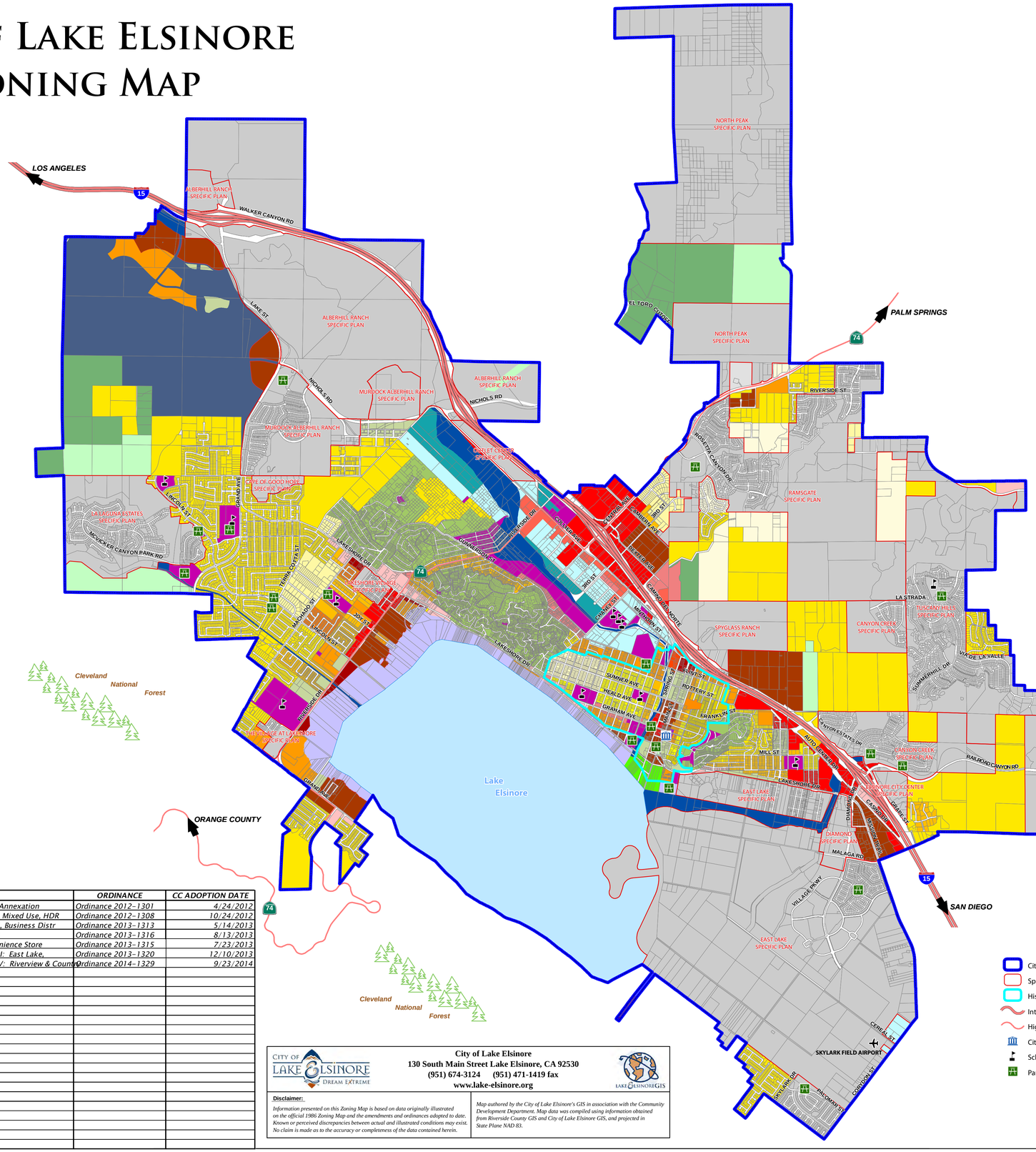
INQUIRY #: 4551235.5
YEAR: 2010
= 500'
N
EDR

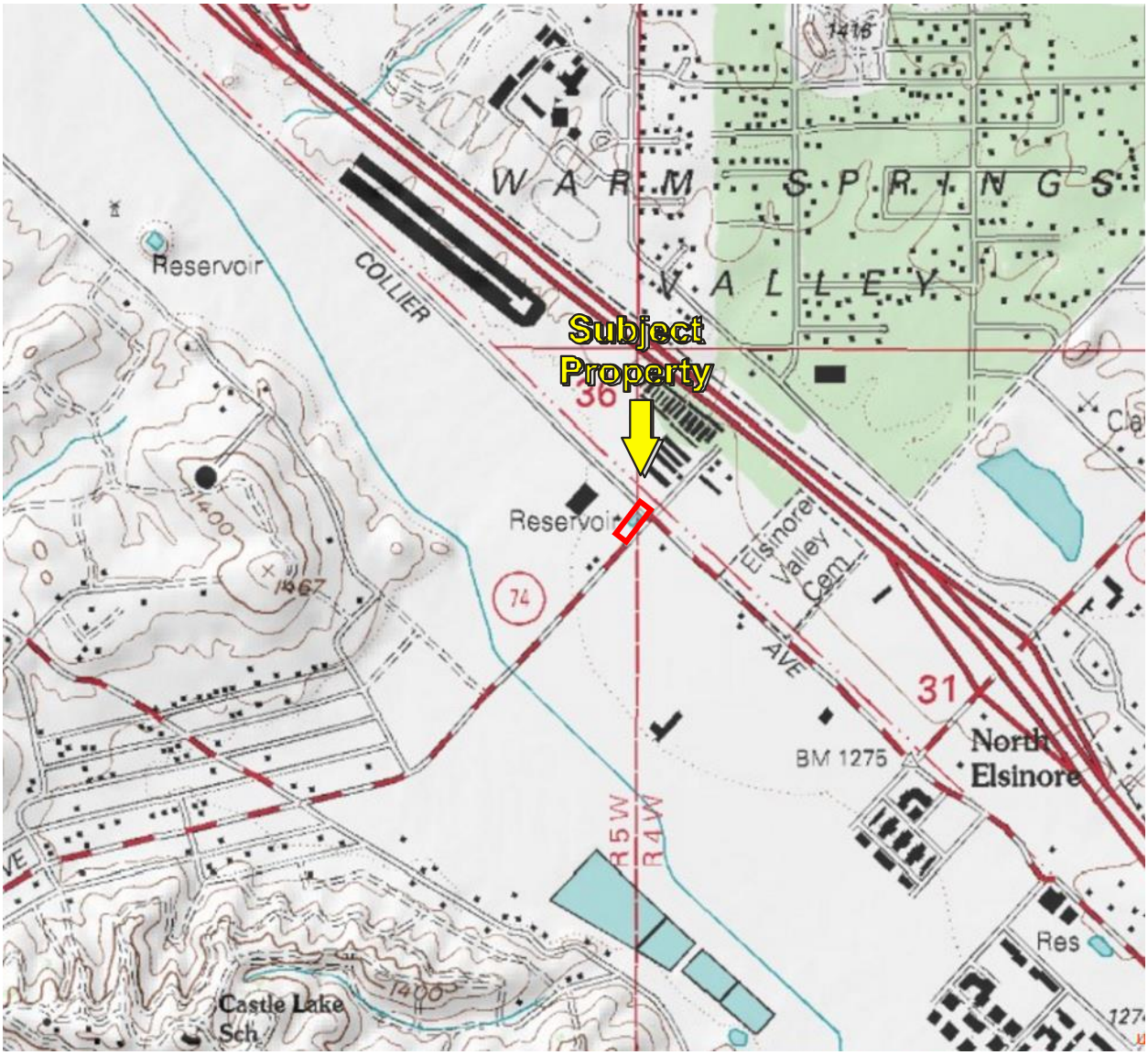
INQUIRY #: 4551235.5
YEAR: 2012
= 500'
N
EDR

APPENDIX D

SUPPORTING DOCUMENTATION

City of Lake Elsinore Zoning Map


LOS ANGELES
ORANGE COUNTY
PALM SPRINGS
SAN DIEGO
Lake Elsinore
Cleveland National Forest
Cleveland National Forest
ALBERHILL RANCH SPECIFIC PLAN
NORTH PEAK SPECIFIC PLAN
MURDOCK ALBERHILL RANCH SPECIFIC PLAN
CANYON CREEK SPECIFIC PLAN
CANYON HILLS SPECIFIC PLAN
CANYON ESTATES SPECIFIC PLAN
RAMSGATE SPECIFIC PLAN
SPYGLASS RANCH SPECIFIC PLAN
TUSCANY HILLS SPECIFIC PLAN
LA LAGUNA ESTATES SPECIFIC PLAN
CAPE OF GOOD HOPE SPECIFIC PLAN
DIAMOND SPECIFIC PLAN
EAST LAKE SPECIFIC PLAN
EAST LAKE SPECIFIC PLAN
LAKESHORE VILLAGE SPECIFIC PLAN
THE VILLAGE AT LAKESHORE SPECIFIC PLAN
ELSINORE CITY CENTER SPECIFIC PLAN
WALKER CANYON RD
NICHOLS RD
RIVERSIDE DR
RAILROAD CANYON RD
MALAGA RD
SKYLARK FIELD AIRPORT
EL TORO CUTOFF
LAKE ST
MAIN ST
GRAHAM AVE
HEALD AVE
SUMNER AVE
POTTERY ST
FRANKLIN ST
PECK ST
MILL ST
AUTO CENTER DR
LAKESHORE DR
CANYON HILLS RD
COTTONWOOD HILLS RD
VILLAGE PKWY
MCVICKER CANYON PARK RD
TERRACOTA ST
MACHADO ST
LINCOLN ST
30TH ST
3RD ST
GRAHAM AVE
RIVERSIDE DR
ROSETTA CANYON DR
RIVERSIDE DR
CANYON ESTATES DR
SUMMERHILL DR
VIA DE LA VALLE
LA STRADA
CERES AVE
CORYDON ST
PALOMAS ST
SKYLARK DR
DIAMOND DR
CASSIA ST
GRUBER ST
JEFFERSON ST
CERES AVE
CORYDON ST
MAITLEN ST
3RD ST
GRAHAM AVE
SUMMERHILL DR
VIA DE LA VALLE
CANYON ESTATES DR
RAILROAD CANYON RD
CANYON HILLS RD
COTTONWOOD HILLS RD
VILLAGE DR
CASSIA ST
GRUBER ST
DIAMOND DR
MALAGA RD
VILLAGE PKWY
CERES AVE
SKYLARK DR
CORYDON ST
POTTERY ST
FRANKLIN ST
PECK ST
MILL ST
AUTO CENTER DR
LAKESHORE DR
CANYON HILLS RD
COTTONWOOD HILLS RD
RAILROAD CANYON RD


W A R M S P R I N G S
V A L L E Y
Reservoir
COLLIER
Subject Property
36
Reservoir
1400
1367
74
Elsinore Valley Cem
AVE
31
BM 1275
North Elsinore
R5W
R4W
Res
Castle Lake Sch
1400

Wednesday, March 2, 2016

Search Again

Property Information Center

Property Information for the 2014-2015 tax year as of January 1, 2014

Property Information

Parcel Number:	378030007-0
Property Address:	29301 RIVERSIDE DR LAKE ELSINORE CA 92530
Legal Description:	Lot 5 MB 008/377 MAP SUBS IN ELSINORE
Property Type:	N/A
Assessment Description:	N/A
Year Built	0000
Square Feet:	N/A
Bedroom:	N/A
Bath:	N/A
Pool:	N
Lot Size:	2.87 Acres

Sales Information

Last Recorded Document:	11/2001
Recording Number:	0573987

Assessed Value Information

Land	460,940
Full Value	460,940
Total Net	460,940

Assessment Information

Assessment Number:	378030007-0
Tax Rate Area:	005-018
Taxability Code:	0-00
Base Year:	2002

Parcel Map

View Parcel Map

Related Property Information

City Sphere:	LAKE ELSINORE
Supervisorial District:	KEVIN JEFFRIES
Landuse Designation:	CITY
Agriculture Preserve:	NOT IN AN AGRICULTURE PRESERVE
School District:	LAKE ELSINORE UNIFIED
Water District:	WMWD
Fema Flood Plan:	FLOOD ZONE 0.2 PCT ANNUAL

Tax Assessment District

CITY OF LAKE ELSINORE ANX
COUNTY FREE LIBRARY
COUNTY STRUCTURE FIRE PROTECTION
CSA 152
ELS MURRIETA ANZA RESOURCE CONS
ELSINORE AREA ELEM SCHOOL FUND
ELSINORE VAL MUN WTR IMP DIST 1
ELSINORE VALLEY CEMETERY
ELSINORE VALLEY MUNICIPAL WATER
FLOOD CONTROL ADMINISTRATION
FLOOD CONTROL ZONE 3
GENERAL
GENERAL PURPOSE
LAKE ELSINORE UNIF IMP NO 96-1
LAKE ELSINORE UNIFIED
METRO WATER WEST 1302999
MT SAN JACINTO JUNIOR COLLEGE
N.W. MOSQUITO & VECTOR CONT DIST
RANCHO LAGUNA RDV 1
RIV CO REG PARK & OPEN SPACE
RIV. CO. OFFICE OF EDUCATION
WESTERN MUNICIPAL WATER

Tuesday, March 8, 2016

Search Again

Property Information Center

Property Information for the 2014-2015 tax year as of January 1, 2014

Property Information

Parcel Number:	378030009-2
Property Address:	
Legal Description:	Lot 5 MB 008/377 MAP SUBS IN ELSINORE
Property Type:	N/A
Assessment Description:	N/A
Year Built	0000
Square Feet:	N/A
Bedroom:	N/A
Bath:	N/A
Pool:	N
Lot Size:	0.08 Acres

Sales Information

Last Recorded Document:	09/2006
Recording Number:	0669997

Assessed Value Information

Land	27,864
Full Value	27,864
Total Net	27,864

Assessment Information

Assessment Number:	378030009-2
Tax Rate Area:	005-018
Taxability Code:	0-00
Base Year:	2007

Parcel Map

View Parcel Map

Related Property Information

City Sphere:	LAKE ELSINORE
Supervisorial District:	KEVIN JEFFRIES
Landuse Designation:	CITY
Agriculture Preserve:	NOT IN AN AGRICULTURE PRESERVE
School District:	LAKE ELSINORE UNIFIED
Water District:	WMWD
Fema Flood Plan:	FLOOD ZONE X

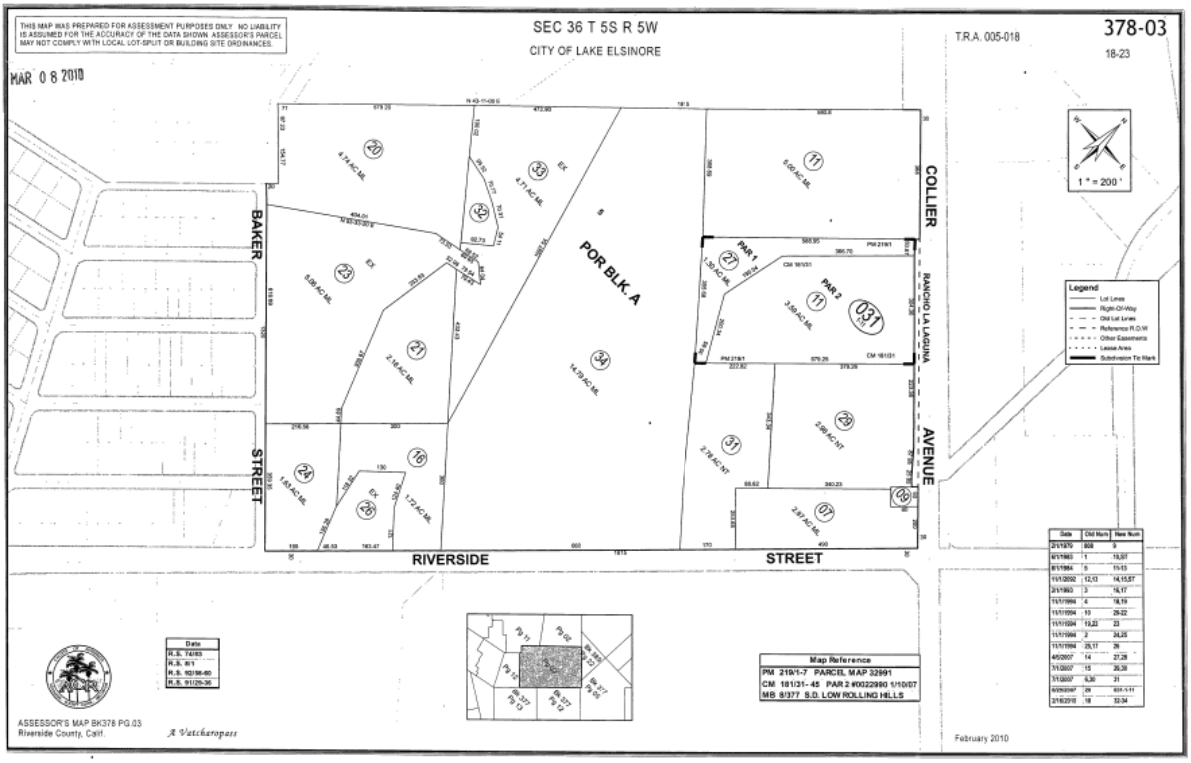
Tax Assessment District

CITY OF LAKE ELSINORE ANX
COUNTY FREE LIBRARY
COUNTY STRUCTURE FIRE PROTECTION
CSA 152
ELS MURRIETA ANZA RESOURCE CONS
ELSINORE AREA ELEM SCHOOL FUND
ELSINORE VAL MUN WTR IMP DIST 1
ELSINORE VALLEY CEMETERY
ELSINORE VALLEY MUNICIPAL WATER
FLOOD CONTROL ADMINISTRATION
FLOOD CONTROL ZONE 3
GENERAL
GENERAL PURPOSE
LAKE ELSINORE UNIF IMP NO 96-1
LAKE ELSINORE UNIFIED
METRO WATER WEST 1302999
MT SAN JACINTO JUNIOR COLLEGE
N.W. MOSQUITO & VECTOR CONT DIST
RANCHO LAGUNA RDV 1
RIV CO REG PARK & OPEN SPACE
RIV. CO. OFFICE OF EDUCATION
WESTERN MUNICIPAL WATER

Parcel Number: 378030007-0
Map Book: 378
Page/Block: 030
Parcel: 7
Check Digit: 0

HOW TO READ THE ASSESSOR'S MAP PAGE

The numerical parcel number on a map page consists of three main segments. The first three digits is the map book number. The second set of three numbers is the page/block number, and the third segment identifies the parcel number.



2.87 AC

GeoRox Engineering
Geotechnical and Environmental Consultanting

User Questionnaire And/Or Prospective Landowner

Description of Site

Legal Site Address: 29301 RIVERSIDE DRIVE, LAKE ELSINORE, CA 92530

Assessor Parcel Number(s): 378-030-007

Current Owner(s): DSGS INC

Phone No.: 562-927-7420

Current Occupant(s): NONE

Phone No.: ~~———~~

Questionnaire:

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
1a. Is the property used for an industrial use?	Yes (No) Unk	Yes No Unk	
1b. Is any adjoining property used for an industrial use?	(Yes) No Unk	Yes No Unk	OFFICE and WAREHOUSING
2a. Did you observe evidence or do you have any prior knowledge that the propertyhas been used for an industrial use in the past?	Yes (No) Unk	Yes No Unk	
2b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used for industrial use in the past?	(Yes) No Unk	Yes No Unk	OFF. & WAREHOUSE

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
3a. Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
3b. Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4a. Did you observe evidence or do you have any prior knowledge that the property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
5a. Are there currently any damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant	Explain in detail any "Yes" answers.

		(if applicable)	(use extra sheet if necessary)
5b. Did you observe evidence or do you have any prior knowledge that there have been previously any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	
6a. Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
6b. Did you observe evidence or do you have any prior knowledge that there have been previously any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
7a. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that originated from a contaminated site?	Yes (No) Unk	Yes No Unk	
7b. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that is of an unknown origin?	Yes (No) Unk	Yes No Unk	
8a. Are there currently any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
8b. Did you observe evidence or do you have any prior knowledge that there have been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
9a. Is there currently any stained soil on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

9b. Did you observe evidence or do you have any prior knowledge that there has been previously, any stained soil on the property?	Yes (No) Unk	Yes No Unk	
10a. Are there currently any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
10b. Did you observe evidence or do you have any prior knowledge that there have been previously, any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
11a. Are there currently any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
11b. Did you observe evidence or do you have any prior knowledge that there have been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
12a. Is there currently evidence of leaks, spills or staining by substances other than water, or foul odors, associated with any flooring, drains, walls, ceilings, or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	
12b. Did you observe evidence or do you have any prior knowledge that there have been previously any leaks, spills, or staining by substances other than water, or foul odors, associated with any flooring drains, walls, ceilings or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

13a. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that contaminants have been identified in the well or system that exceed guidelines applicable to the water system?	Yes No Unk N/A	Yes No Unk	
13b. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that the well has been designated as contaminated by any government environment health agency?	Yes No Unk N/A	Yes No Unk	
14. Does the owner or occupant of the property have any knowledge of environmental liens or govern-mental notification relating to past or recurrent violations of environ-mental laws with respect to the property or any facility located on the property?	Yes (No) Unk To the best of their knowledge *	Yes No Unk	
15a. Has the owner or occupant of the property been informed of the past existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk * To the best of their knowledge	Yes No Unk	
15b. Has the owner or occupant of the property been informed of the current existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	
15c. Has the owner or occupant of the property been informed of the past existence of environmental violations with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

16. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	Yes (No) Unk	Yes No Unk	
17. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concern-ing a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	Yes (No) Unk	Yes No Unk	
18a. Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a storm water system?	Yes (No) Unk *	Yes No Unk	
18b. Does the property discharge waste water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a sanitary sewer system?	Yes (No) Unk *	Yes No Unk	
19. Did you observe evidence or do you have any prior knowledge that any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	Yes (No) Unk *	Yes No Unk	
20. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	Yes (No) Unk	Yes No Unk	

* Not to the best of their knowledge.

This questionnaire was completed by:

Name RON GRAVES

Title Broker

Firm Coldwell Banker Commercial

Address 4660 La Jolla Village Dr.
Suite 1070, San Diego, CA 92121

Phone Number 858 822-9215

Date 3/4/16

BY SMALL

GeoRox Engineering
Geotechnical and Environmental Consultanting

User Questionnaire And/Or Prospective Landowner

Description of Site

Legal Site Address: VACANT LAND

Assessor Parcel Number(s): 378-030-009

Current Owner(s): Christos J & MARY J SMYRNIOTIS

Phone No.:

Current Occupant(s): VACANT

Phone No.: N/A

Questionnaire:

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
1a. Is the property used for an industrial use?	Yes (No) Unk	Yes No Unk	
1b. Is any adjoining property used for an industrial use?	(Yes) No Unk	Yes No Unk	OFFICE and WAREHOUSING
2a. Did you observe evidence or do you have any prior knowledge that the propertyhas been used for an industrial use in the past?	Yes (No) Unk	Yes No Unk	
2b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used for industrial use in the past?	(Yes) No Unk	Yes No Unk	SAME as above

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)
3a. Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
3b. Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4a. Did you observe evidence or do you have any prior knowledge that the property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
4b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes (No) Unk	Yes No Unk	
5a. Are there currently any damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant	Explain in detail any "Yes" answers.

		(if applicable)	(use extra sheet if necessary)
5b. Did you observe evidence or do you have any prior knowledge that there have been previously any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes (No) Unk	Yes No Unk	
6a. Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
6b. Did you observe evidence or do you have any prior knowledge that there have been previously any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes (No) Unk	Yes No Unk	
7a. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that originated from a contaminated site?	Yes (No) Unk	Yes No Unk	
7b. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that is of an unknown origin?	Yes (No) Unk	Yes No Unk	
8a. Are there currently any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
8b. Did you observe evidence or do you have any prior knowledge that there have been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes (No) Unk	Yes No Unk	
9a. Is there currently any stained soil on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

9b. Did you observe evidence or do you have any prior knowledge that there has been previously, any stained soil on the property?	Yes (No) Unk	Yes No Unk	
10a. Are there currently any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
10b. Did you observe evidence or do you have any prior knowledge that there have been previously, any registered or unregistered storage tanks (above or underground) located on the property?	Yes (No) Unk	Yes No Unk	
11a. Are there currently any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
11b. Did you observe evidence or do you have any prior knowledge that there have been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes (No) Unk	Yes No Unk	
12a. Is there currently evidence of leaks, spills or staining by substances other than water, or foul odors, associated with any flooring, drains, walls, ceilings, or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	
12b. Did you observe evidence or do you have any prior knowledge that there have been previously any leaks, spills, or staining by substances other than water, or foul odors, associated with any flooring drains, walls, ceilings or exposed grounds on the property?	Yes (No) Unk	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

13a. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that contaminants have been identified in the well or system that exceed guidelines applicable to the water system?	Yes No Unk N/A	Yes No Unk	
13b. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that the well has been designated as contaminated by any government environment health agency?	Yes No Unk N/A	Yes No Unk	
14. Does the owner or occupant of the property have any knowledge of environmental liens or govern-mental notification relating to past or recurrent violations of environ-mental laws with respect to the property or any facility located on the property?	Yes (No) Unk To the best of their Knowledge *	Yes No Unk	
15a. Has the owner or occupant of the property been informed of the past existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk * To the best of their Knowledge	Yes No Unk	
15b. Has the owner or occupant of the property been informed of the current existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	
15c. Has the owner or occupant of the property been informed of the past existence of environmental violations with respect to the property or any facility located on the property?	Yes (No) Unk *	Yes No Unk	

Question	Owner	Occupant (if applicable)	Explain in detail any "Yes" answers. (use extra sheet if necessary)

16. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	Yes (No) Unk	Yes No Unk	
17. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concern-ing a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	Yes (No) Unk	Yes No Unk	
18a. Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a storm water system?	Yes (No) Unk *	Yes No Unk	
18b. Does the property discharge waste water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a sanitary sewer system?	Yes (No) Unk *	Yes No Unk	
19. Did you observe evidence or do you have any prior knowledge that any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	Yes (No) Unk *	Yes No Unk	
20. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	Yes (No) Unk	Yes No Unk	

* Not to the best of their knowledge.

This questionnaire was completed by:

Name RON GRAVES

Title Broker

Firm Coldwell Banker Commercial

Address 4660 La Jolla Village Dr.
Suite 1070, San Diego, CA 92121

Phone Number 858 822-9215

Date 3/4/16

Elsinore Groundwater Basin

- Groundwater Basin Number: 8-4
- County: Riverside
- Surface Area: 25,700 acres (40.2 square miles)

Basin Boundaries and Hydrology

The Elsinore Groundwater Basin underlies the Elsinore Valley in western Riverside County. The basin is bounded on the southwest by the Santa Ana and Elsinore Mountains along the Willard fault, a splay of the active Elsinore fault zone. The basin adjoins the Temecula Valley Groundwater Basin on the southeast at a low surface drainage divide. The basin is bounded on the northwest by the Temescal Subbasin of the Upper Santa Ana River Valley Groundwater Basin at a constriction in Temescal Wash. The basin is bounded on the northeast by nonwater-bearing rocks of the Peninsular Ranges along the Glen Ivy fault. Average annual precipitation ranges from 12 to 14 inches. Lake Elsinore lies in a closed basin formed between strands of the active Elsinore fault zone.

Hydrogeologic Information

Water Bearing Formations

The Elsinore Groundwater Basin contains alluvial fan, floodplain, and lucustrine deposits, which are underlain by alluvium of the Pauba Formation (DWR 1981). The maximum thickness of sedimentary deposits reaches 2,300 feet beneath Lake Elsinore (DWR 1981). Specific yield for the basin ranges from about 6 to 16 percent and averages about 7.6 percent (SWRB 1956).

Alluvial Fan, Floodplain, and Lacustrine Deposits. These deposits are Late Pleistocene to Holocene in age and form the surficial materials of the basin. Alluvial fan deposits of gravel, sand, silt, and clay are found near the western and northeastern edges of the basin emanating from the adjacent crystalline mountains. The interior of the valley contains floodplain deposits that reach a thickness of about 200 feet and contain stringers of sand and gravel in finer silt and clay. In the zone of inundation of Lake Elsinore, fine-grained lacustrine deposits of sand, silt, and clay reach 800 feet in thickness (DWR 1981). The lake deposits have a specific yield of about 6 percent, whereas the floodplain deposits range from 9 to 12 percent (DWR 1981).

Pauba Formation. The Pleistocene age Pauba Formation is a composed of alluvial sandstone and fanglomerate members (Morton and others 1999) that reach a maximum thickness of about 2,200 feet beneath lake Elsinore (DWR 1981). This is the principal water-bearing unit of the basin, with the most productive wells extracting from alluvial sand and gravel bodies that occur as stringers within less pervious silt- and clay–rich deposits. In general, sediments are coarser near the margins of the basin and become finer toward Lake Elsinore. Specific yield for the Pauba Formation averages about 9 percent (DWR 1981).

Restrictive Structures

Groundwater movement in the basin is strongly influenced by faults cutting the alluvial and lacustrine sediments in Elsinore Groundwater Basin. Differences in groundwater elevation are found across the Wildomar, Willard, and Glen Ivy faults, indicating that they are barriers to groundwater flow (DWR 1953, SWRB 1956; DWR 1981). As many as 8 separate fault bounded blocks are interpreted in the basin and there appears to be little groundwater movement across these bounding faults (DWR 1981).

Recharge Areas

The principal recharge of the basin is from infiltration of stream flow through alluvial fan deposits near the edges of the basin and through gravel deposits along the course of the San Jacinto River. Other contributing sources include infiltration from unlined channels overlying the basin, underflow from saturated alluvium and fractures within the surrounding bedrock mountains and hills, and spreading of water in recharge basins (WE 2000).

Groundwater Level Trends

Groundwater levels within Elsinore Groundwater Basin declined more than 100 feet between 1927 and 1950 (DWR 1953). A hydrograph from one well shows that water level declined about 110 feet in the southern part of the basin from 1967 through 1985. However, a hydrograph from a well in the northern part of the basin shows a rise in water level of about 65 feet from 1963 through 1980. Under natural conditions, groundwater should flow generally toward Lake Elsinore; however, because faults cutting the sediments impede groundwater movement, groundwater flow is dominantly contained within fault blocks in the basin.

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity is estimated to be about 27,000 af (SWRB 1956, DWR 1975), 1,840,000 af (DWR 1981), and 1,400,000 af (EVMWD 2001).

Groundwater in Storage. Groundwater in storage in 1964 and 1975 was estimated to be about 1,000,000 af (DWR 1981). About 245,000 af of available dry storage in 1999 (EVMWD 2001) suggests that about 1,155,000 af of groundwater in storage was available.

Groundwater Budget (Type C)

Mean subsurface inflow is estimated to be about 800 af/yr (SWRB 1956). Total extraction for 1978 is estimated to have been 8,081 af (DWR 1981).

Groundwater Quality

Characterization. Groundwater northeast of Lake Elsinore is calcium sulfate character, whereas groundwater southeast of the lake is calcium bicarbonate (SWRB 1956). Groundwater in the central part of the basin has sodium sulfate-bicarbonate character (DWR 1981). Springs and wells near the town of Elsinore yield water of sodium sulfate character (DWR 1981). The range of TDS content for 17 public wells is 290 to 680 mg/L and the average TDS content is 460 mg/L.

Impairments. Fluoride content exceeding recommended levels has been found in groundwater near the town of Elsinore (DWR 1953; SWRB 1967).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	18	1
Radiological	20	0
Nitrates	18	0
Pesticides	20	0
VOCs and SVOCs	20	1
Inorganics – Secondary	18	4

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 5,400 gal/min (DWR 1978)	Average:
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range: to 2,306 ft (DWR 1978)	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
US Geological Survey	Groundwater levels	1
US Geological Survey	Miscellaneous water quality	1
Department of Health Services and cooperators	Title 22 water quality	18

Basin Management

Groundwater management:	Elsinore Valley Municipal Water District has proposed a groundwater management plan.
Water agencies	
Public	Elsinore Valley Municipal Water District
Private	

References Cited

California Department of Water Resources (DWR). 1953. *Elsinore Basin Investigation.* Bulletin No. 9.

_____, Southern District. 1978. A Preliminary Evaluation of *Ground Water Conditions in the Vicinity of Lake Elsinore. Southern* District Technical Information Record 1080-A-1 34 p.

_____, Southern District. 1981. *Investigatin of Ground Water Supply for Stabilization of Level of Lake Elsinore, Riverside County.* District Report to Department of Parks and Recreation under Interagency agreement 162083. 45 p.

California State Water Resources Board (SWRB). 1956. *Santa Ana River Investigation:* State Water Resources Board Bulletin No. 15. 207 p. [nb: later published in 1959 as DWR Bulletin No. 15).

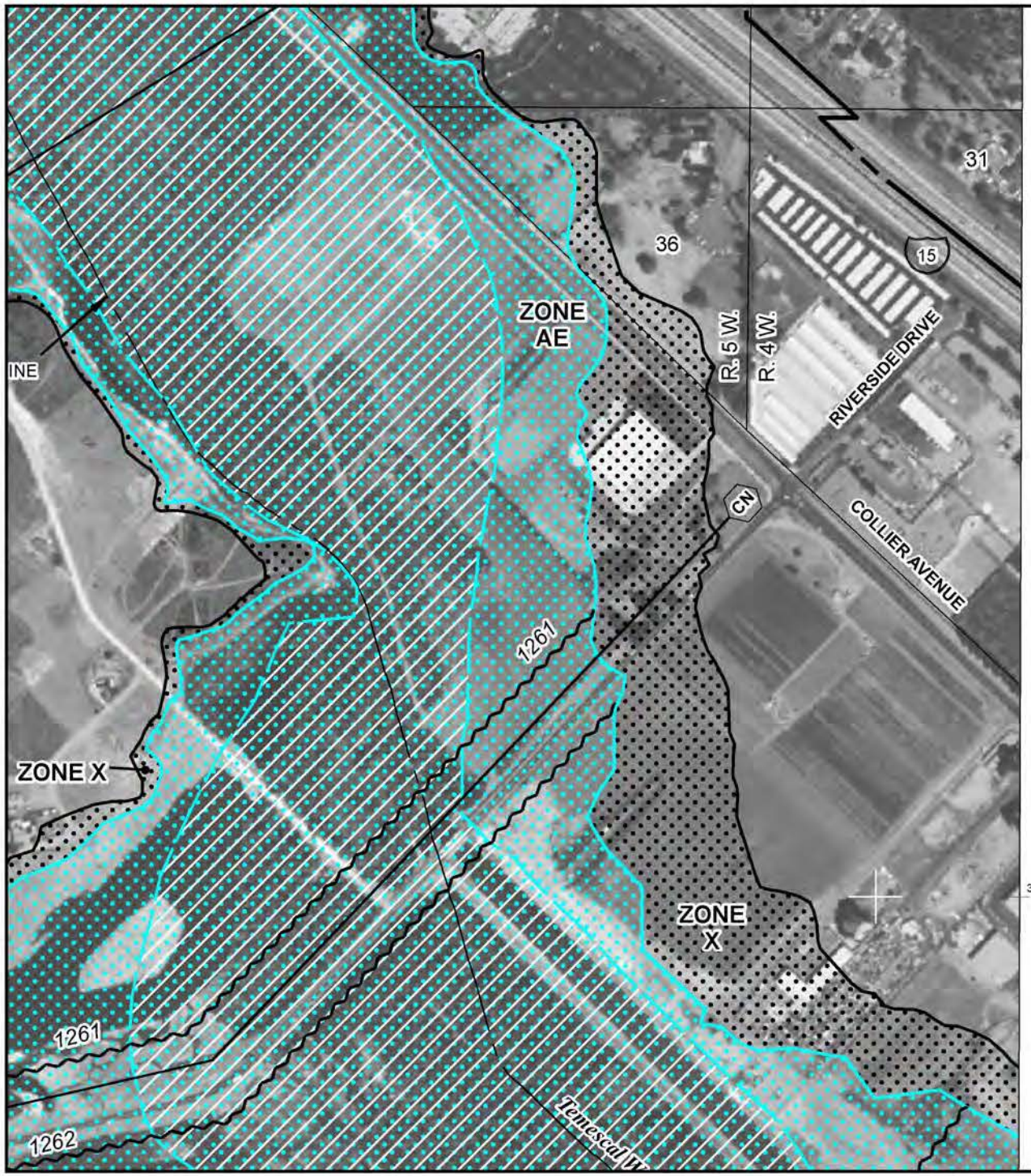
Eastern Valley Municipal Water District (EVMWD). 2001. Elsinore Valley Pilot Recharge Demonstration Project Grant Application.

Morton, D.M., Hauser, R.M., and Ruppert, K.R. 1999. *Preliminary digital geologic map of the Santa Ana 30'x60' quadrangle, southern California, version 1.0.* U.S. Geological Survey Open-File Report 99-172 15p., scale 1:100,000, 2 sheets.

Wildermuth Environmental (WE). 2000. *TIN/TDS Study Phase 2A.*

Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2028G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 2028 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAKE ELSINORE, CITY OF	060636	2028	G
RIVERSIDE COUNTY	060245	2028	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C2028G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

RCRA Waste Code By Year Matrix Report

ID Number: CAD981615784

Entity Type: GENERATOR

Weight (in Tons)

Ship Years

RCRA Code	Description	1993	1994	1998	1999	2000	2001
	Blank/Unknown	**5.0062**	**0.6000**			**0.7506**	**0.4500**
D006	Cadmium			**0.3276**			
D039	Tetrachloroethylene				**1.4826**	**0.3402**	**2.1252**
NONE	Blank/Unknown						
Grand Total		**5.0062**	**0.6000**	**0.3276**	**1.4826**	**1.0908**	**2.5752**

2002	2003	2004	2006	2007	2008	2009	2013
0.3402	**0.5075**	**0.3000**	**2.0000**	**0.7500**	**0.9760**	**1.0000**	**1.0500**
		0.6500					
0.3402	**0.5075**	**0.9500**	**2.0000**	**0.7500**	**0.9760**	**1.0000**	**1.0500**

2015
0.1500
0.1500

The URL you requested has changed. You have been redirected to the new URL. Please update your bookmarks.

ECHO Enforcement and Compliance History Online

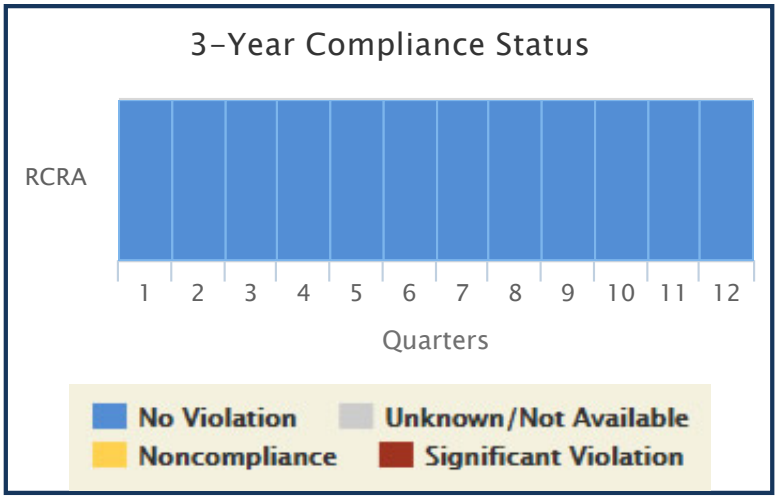
Detailed Facility Report

Facility Summary

E Z PRODUCTS

17999 COLLIER AVE, LAKE ELSINORE, CA 92530

FRS (Facility Registry Service) ID: 110002725141
EPA Region: 09
Latitude: 33.69529
Longitude: -117.34766
Locational Data Source: FRS
Industry: No description found
Indian Country: N



Enforcement and Compliance Summary

Statute	Insp (5 Years)	Date of Last Inspection	Current Compliance Status	Qtrs in NC (Non-Compliance) (of 12)	Qtrs in Significant Violation	Informal Enforcement Actions (5 years)	Formal Enforcement Actions (5 years)	Penalties from Formal Enforcement Actions (5 years)	EPA Cases (5 years)	Penalties from EPA Cases (5 years)
RCRA	--	--	**No Violation**	0	0	--	--	--	--	--

Regulatory Information

Clean Air Act (CAA): No Information
Clean Water Act (CWA): No Information
Resource Conservation and Recovery Act (RCRA): Active (H) SQG (CAD981615784)
Safe Drinking Water Act (SDWA): No Information

Other Regulatory Reports

Air Emissions Inventory (EIS): No Information
Greenhouse Gas Emissions (eGGRT): No Information
Toxic Releases (TRI): No Information

Facility/System Characteristics

Facility/System Characteristics

System	Statute	Identifier	Universe	Status	Areas	Permit Expiration Date	Indian Country	Latitude	Longitude
FRS		110002725141					N	33.69529	-117.34766
RCR	RCRA	CAD981615784	SQG	Active (H)			N	33.695181	-117.34679

Facility Address

System	Statute	Identifier	Facility Name	Facility Address
FRS		110002725141	E Z PRODUCTS	17999 COLLIER AVE, LAKE ELSINORE, CA 92530
RCR	RCRA	CAD981615784	E Z PRODUCTS	17999 COLLIER AVE, LAKE ELSINORE, CA 92530

Facility SIC (Standard Industrial Classification) Codes

System	Identifier	SIC Code	SIC Desc
No data records returned			

Facility NAICS (North American Industry Classification System) Codes

System	Identifier	NAICS Code	NAICS Description
No data records returned			

Facility Tribe Information

Tribal Name	EPA Tribal ID	Distance to Tribe (miles)
Pechanga Reservation	100000198	21.35
Soboba Reservation	100000283	24.79

Enforcement and Compliance

Compliance Monitoring History (5 years)

Statute	Source ID	System	Inspection Type	Lead Agency	Date	Finding
No data records returned						

Entries in italics are not considered inspections in official counts.

Compliance Summary Data

Statute	Source ID	Current SNC (Significant Non-compliance)/HPV (High Priority Violation)	Description	Current As Of	Qtrs in NC (Non-Compliance) (of 12)
RCRA	CAD981615784	No		03/05/2016	0

Three Year Compliance Status by Quarter

Statute	Program/Pollutant/Violation Type	QTR 1	QTR 2	QTR 3	QTR 4	QTR 5	QTR 6	QTR 7	QTR 8	QTR 9	QTR 10	QTR 11	QTR 12
RCRA (Source ID: CAD981615784)		04/01-06/30 2013	07/01-09/30 2013	10/01-12/31 2013	01/01-03/31 2014	04/01-06/30 2014	07/01-09/30 2014	10/01-12/31 2014	01/01-03/31 2015	04/01-06/30 2015	07/01-09/30 2015	10/01-12/31 2015	01/01-03/31 2016
RCRA	Facility-Level Status												

Informal Enforcement Actions (5 Years)

Statute	Source ID	Type of Action	Lead Agency	Date
No data records returned				

Formal Enforcement Actions (5 Years)

Statute	Source ID	Type of Action	Lead Agency	Date	Penalty	Penalty Description
No data records returned						

ICIS (Integrated Compliance Information System) Case History (5 years)

Primary Law/Section	Case No.	Case Type	Lead Agency	Case Name	Issued/Filed Date	Settlement Date	Federal Penalty	State/Local Penalty	SEP (Supplemental Environmental Project) Cost	Comp Action Cost
No data records returned										

Environmental Conditions

Water Quality

Permit ID	Combined Sewer System?	Number of CSO (Combined Sewer Overflow) Outfalls	Watershed (HUC (Hydrologic Unit Code) 8)	Watershed Name (HUC (Hydrologic Unit Code) 8)	Watershed (HUC (Hydrologic Unit Code) 12)	Watershed Name (HUC (Hydrologic Unit Code) 12)	Receiving Waters	Impaired Waters	Impaired Class	Causes of Impairment(s) by Group(s)	Watershed with ESA (Endangered Species Act)-listed Aquatic Species?
No data records returned											

Waterbody Designated Uses

Reach Code	Waterbody Name	Exceptional Use	Recreational Use	Aquatic Life Use	Shellfish Use	Beach Closure Within Last Year	Beach Closure Within Last Two Years
No data records returned							

Air Quality

Non-Attainment Area?	Pollutant(s)
Yes	Ozone
No	Lead
Yes	Particulate Matter

Pollutants

Toxics Release Inventory History of Reported Chemicals Released in Pounds per Year at Site

TRI Facility ID	Year	Total Air Emissions	Surface Water Discharges	Off-Site Transfers to POTWs (Publicly Owned Treatment Works)	Underground Injections	Releases to Land	Total On-site Releases	Total Off-site Releases
No data records returned								

Toxics Release Inventory Total Releases and Transfers in Pounds by Chemical and Year

Chemical Name
No data records returned

Demographic Profile

Demographic Profile of Surrounding Area (3 Miles)

This section provides demographic information regarding the community surrounding the facility. ECHO compliance data alone are not sufficient to determine whether violations at a particular facility had negative impacts on public health or the environment. Statistics are based upon the 2010 US Census and American Community Survey data, and are accurate to the extent that the facility latitude and longitude listed below are correct. The latitude and longitude are obtained from the EPA Locational Reference Table (LRT) when available.

Radius of Area:	3	Land Area:	87%	Households in Area:	10,570
Center latitude:	33.69529	Water Area:	13%	Housing Units in Area:	11,668
Center Longitude:	-117.34766	Population Density:	1,540/sq.mi.	Households on Public Assistance:	352
Total Persons:	37,363	Percent Minority:	65%	Persons Below Poverty Level:	13,362

Race Breakdown	Persons (%)	Age Breakdown	Persons (%)
White:	21,958 (58.77%)	Child 5 years and younger:	3,336 (8.93%)
African-American:	1,672 (4.48%)	Minors 17 years and younger:	11,924 (31.91%)
Hispanic-Origin:	20,028 (53.6%)	Adults 18 years and older:	25,439 (68.09%)
Asian/Pacific Islander:	1,623 (4.34%)	Seniors 65 years and older:	2,310 (6.18%)
American Indian:	397 (1.06%)		
Other/Multiracial:	11,714 (31.35%)		

Education Level (Persons 25 & older)	Persons (%)	Income Breakdown	Households (%)
Less than 9th Grade:	2,038 (10.14%)	Less than $15,000:	1,128 (10.74%)
9th through 12th Grade:	2,795 (13.91%)	$15,000 - $25,000:	964 (9.18%)
High School Diploma:	6,384 (31.76%)	$25,000 - $50,000:	2,439 (23.23%)
Some College/2-yr:	6,071 (30.21%)	$50,000 - $75,000:	2,419 (23.04%)
B.S./B.A. or More:	2,811 (13.99%)	Greater than $75,000:	3,549 (33.8%)

Appendix H

Hydrology Study

Hydrology Study

for

29301 RIVERSIDE DRIVE
LAKE ELSINORE, CA 92530

JUNE 01, 2018

Prepared by:

Rahman Engineering Services, Inc.

5671 Schaefer Ave., Unit # F
Chino, CA 91710

(213) 400-8078

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Appendix A: Soil Type and Runoff Index Numbers .....
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Appendix C: Design Calculations .....

Project Description:

The site comprises of 2 assessor's parcel (lots - APN 378-030-007 AND APN 378-030-009). Currently, the site is vacant, undeveloped land with shrubs, grass and weeds grown throughout the site. The site is located on the west side of the intersection of Riverside Drive and Collier Avenue in the City of Lake Elsinore. The site is approximately 2.40 acres (104,045 sf) with moderate terrain that predominantly slopes from the east to the west; with approximately 8 feet of topographic relief across the site. Drainage flow at the site is dominated by sheet flowing across the property towards the west. Figure 1 shows the site and surrounding features.

The project proposes to develop commercial buildings with associated paved driveway, parking, walkway and landscape throughout. The proposed development consists of two single-story commercial buildings (one restaurant and one food mart with gasoline dispensing island) with total impervious coverage of 91,422 sf.

Purpose and objective:

The purpose and objective of this hydrology study are as follows:

1) to determine the design peak 10-year & 100-year frequency storm runoff for the project site.
2) To establish the finished pad elevation of proposed buildings that will be at least one foot (1-ft) above the water surface elevation of the 100-yr storm event.
3) To determine the hydraulic capacities of proposed storm drainage systems including ribbon gutter and parkway culvert to convey onsite storm runoffs into WQMP BMPS and ultimately to the street gutter in case of heavy rain.

Existing Drainage Pattern:

The watershed for the site is comprised of a single subarea (Subarea C). Currently, the drainage runoff from the site is towards the natural topographic direction from east to the west.

Proposed Drainage Pattern:

The watershed for the site is divided into two subareas; namely Subarea A and Subarea B. Subarea B is the tributary area from the C-store (23,242 sft) and adjacent paved area discharged into the proposed Bioretention basin located north of the driveway from Collier Ave.; and Subarea A is the remainder portion that includes the dispenser area, restaurant and the associated paved parking and driveway areas (62,929 sft). Discharge from the Subarea A is into the proposed Bioretention basin, located west of the driveway from Riverside Drive.

Methodology:

The hydrology calculations performed utilized the Section D -Rational Method of the Riverside County Flood Control and Water Conversation District Hydrology Manual (RCHM), dated April 1978. The 10-Year and 100-Year storm return frequency rainfall was used for existing and developed conditions.

The watershed studied consists of proposed project site is situated within the Riverside County within the 2-year and 100-year l-hour isohyet of 0.57 and 1.45 inches respectively (see enclosed Hydrology Map in Figure 2 to 4). The isohyet for 10-yr 1-hour rainfall was then interpolated from Figure 4 as 0.92 inches. The slope for the rainfall intensity curve for the site area was found to be 0.45 (see Figure 5).

Flood Insurance Rate Maps (FIRM):

The site is located in Zone X of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), Riverside County, California and incorporated areas panel 2028 of 3805 with map number 06065C2028G dated August 28, 2008. A Zone X is designation as areas determined to be outside of the 0.2% annual chance floodplain or areas of 0.2% annual chance flood: areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by leeves from 1% annual chance flood. The majority of the site falls within the later definition of Zone X. The FIRM map for this project is located in Figure 6.

Watershed Precipitation Data:

Precipitation data from the Isohyetal maps of the RCHM was used in this report and is shown below.

Table 1 – Precipitation Data (Rational Method Calculations)

Storm Event	Precipitation (inches)	Ref. Figure/Appendix
10-Yr, 1-Hr	0.92	
25-Yr, 1-Hr	1.12	
100-Yr, 1-Hr	1.45	

Hydrology Calculations & Summary:

Time of Concentration (Tc)

2.55e time of concentration (Tc) was obtained by first defining the subareas and their respective length of flow, elevation difference, and type of development. This data was then plotted onto Figure D-3 (see Figure 7), Time of Concentration Nomograph, in order to obtain the time of concentration for each drainage subarea per RCHM. Subarea Initial Time of Concentrations (Tc) has been shown in Table 2 below:

Table 2 – Time of Concentration

Development Stage (Pre/Post)	Node @ High Elev. (ft)	Node @ Low elev (ft)	Node Elev. Diff. (ft)	Flow length, L (ft)	Tc (min)	Ref. Appendix
Post-dev	1267.10	1264.55	2.55	280	7.6	
Post-dev	1266.25	1265.14	1.11	320	9.5	
Pre-dev	1269.00	1261.00	8.00	510	15.0	

Rainfall Intensity, I (in/hr)

This site-specific precipitation values from Table 1 were plotted onto Plate D-4 (Figure 8) in order to find the rainfall intensities (I), based on the log-log slope of site location (= 0.45) per Figure 5.

Subarea Rainfall Intensity (I) has been shown in table 3 below.

Table 3 – Rainfall Intensity

Subarea	Tc (Min)		100 Yr Rainfall Intensity, I_{100} (in/hr)		25 Yr Rainfall Intensity, I_{25} (in/hr)		10 Yr Rainfall Intensity, I_{10} (in/hr)		Ref. Appendix
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
A(Apn: 378-030-007)		7.6	`	3.65		2.82		2.26	
B(Apn: 378-030-009)		9.5		3.3		2.55		2.06	
A+B	15		2.82		2.08		1.67		

Soil Types and Runoff Index Numbers

Soil types on and near the project site (for on-site tributary) and corresponding Runoff Index Numbers (AMC II) used in this report are shown in Appendix A.

For the entire project site, soil type "B" is shown per Figure 8. For the existing condition, barren soil is selected as the site is 100% undeveloped with single subarea. For the developed condition, the project is composed of pervious (landscape) and impervious (roof, driveway/walkway/retaining wall) areas and the site is divided into two Subareas. Mixed cover has been calculated based on proportioning area of Landscape and Impervious Area.

Table 4 – On-site Pre-developed Runoff Index Numbers

Soil Cover	Soil Type	Quality of Cover	Area (SF)			SCS Curve No. (AMC II)		SCS Curve No. (AMC III)
			Pervious	Imp.	Total			
Barren	B	-	104,045	0	104,045		**86**	**97**
Landscape	B	-	0	0	0		56	
Imp. Area		-	0	0	0		98	
Mixed Cover	B	-				86 (0)	0 (0)	0
						56 (0)		
						98 (0)		

Table 5 – On-site Post-developed Condition Runoff Index Numbers; Subarea A

Soil Cover	Soil Type	Quality of Cover	Area (SF)			SCS Curve No. (AMC II)		SCS Curve No. (AMC III)
			Pervious	Imp.	Total			
Landscape	B	Good		0			56	76
Imp. Area		-	0				98	100
Mixed Cover	B	-					**92**	**98**
			10,605	66,752	77,357	56 (10,605)		
						98 (66,752)		

Table 6 – On-site Post-developed Runoff Index Numbers: Subarea B

Soil Cover	Soil Type	Quality of Cover	Area (SF)			SCS Curve No. (AMC II)		SCS Curve No. (AMC III)
			Pervious	Imp.	Total			
Landscape	B	Good		0			56	76
Imp. Area		-	0				98	100
Mixed Cover	B	-	1,463	25,205	26,668	56 (1,463)	**96**	**99**
						98 (25,205)		

Calculation of Runoff Coefficient, C:

The Runoff Coefficient, C can be calculated based on the % impervious and the Runoff Index based on rainfall intensity (see Appendix B) for the pre- and post-developed conditions and are presented below.

Pre-developed condition (Subarea A+B):
C_{10} = 0.79+((0.81-0.79)/0.5)*.0.17) = 0.80
C_{25}= 0.79+((0.81-0.79)/0.5)*.0.17) = 0.81
C_{100} = 0.83+(0.84-0.83)/0.5)*0.32) = 0.84

Post-developed condition, Subarea A:
C_{10} = 0.89
C_{25} = 0.90
C_{100} = 0.90

Post-developed condition, Subarea B:
C_{10} = 0.90
C_{25} = 0.90
C_{100} = 0.90

Calculation of Flow, Q:

The pre and post-development flow computations were performed and are presented below.

Table 7 – Runoff Flow

Subarea	Develop-ment Stage (Pre/Post)	Area, A (Ac)	Design Storm Frequency		Rainfall Intensity, I (in/hr)	Runoff Coefficient, C	Flow, Q = CIA, (cfs)
			Yr	Hr			
A	Post	1.78	10	1	2.26	0.9	3.61
			100		3.65	0.90	5.83
B	Post	0.61	10	1	2.06	0.9	1.14
			100		3.3	0.90	1.82
A+B	Pre	2.39	10	1	1.67	0.80	3.19
			100		2.82	0.84	5.66

Summary:

For the entire project site, Subarea A+B:

Pre-developed Q_{100} = 5.66 cfs

Pre-developed Q_{25} = 4.02 cfs

Pre-developed Q_{10} = 3.19 cfs

For Subarea A:

Post-developed Q_{100} = 5.83 cfs

Post-developed Q_{25}= 4.51 cfs

Post-developed Q_{10} = 3.57 cfs

For Subarea B:

Post-developed Q_{100} = 1.82 cfs

Post-developed Q_{25}= 1.41 cfs

Post-developed Q_{10} = 1.14 cfs

For Subarea A+B:

Post-developed Q_{100} = 7.75 cfs

Post-developed Q_{25}= 5.92 cfs

Post-developed Q_{10} = 3.75 cfs

Delta Q_{100} = 7.75-5.66 = 2.09 cfs;

Delta Q_{25} = 5.92-4.02 = 1.9 cfs;

Delta Q_{10} = 3.61-3.19 = 0.42 cfs

Results:

This hydrology study indicates that the Q100-yr storm events will produce a runoff of 5.83 cfs for Subarea A and 1.82 cfs for Subarea B respectively and that of and 10-yr storm events will produce a runoff of 3.61 cfs for Subarea A and 1.14 cfs for Subarea B respectively in the post- development stage from the subject site.

The Q25-yr storm events will produce a runoff of 4.51 cfs for Subarea A and 1.41 cfs for Subarea B respectively in the post-development stage from the subject site. Total runoff for 100- yr/25-yr/10-yr storm would be 7.75 cfs/5.92cfs/3.75 cfs respectively.

The differences of flows in 100-yr storm event would be 2.09 cfs or (2.09/5.66*100 =) 37% increase and that of 25-yr would be 1.9 cfs or (1.9/4.02*100=) 47.3% increase and that of 10-yr would be 0.42 cfs or (0.42/3.19*100=) 13.1% increase. The difference in all cases of storm events between the pre-and post-developed conditions are still within the range of moderate increase. Furthermore, the flow pattern would be reversed as opposed to the pre-developed condition and the storm water will be captured in on-site in landscape area where bioretention basins are proposed. Only excess runoff would be allowed to overflow onto street gutters through via parkway culvert. Considering the flow of 25-yr rainfall events, corresponding design storm drain overflow channel of 3' widex 3" deep (metal) for Subarea A and 3-4" PVC (SDR 35) pipe for Subarea B (see Appendix C).

Further analysis was done (see Appendix C) to find out the required minimum pad elevation considering the highest Q at Node 2 which resulted in a channel depth of 0.0782 ft (1") over the entire parking area of Subarea A. Therefore, the proposed minimum pad elevation (1265.33') is okay.

Conclusions:

The increase in runoff cause by this development will be mitigated by containing the 100 year runoff within the street r/w. The on-site BMP and storage facilities are adequate to handle the increase runoff .

FIGURES

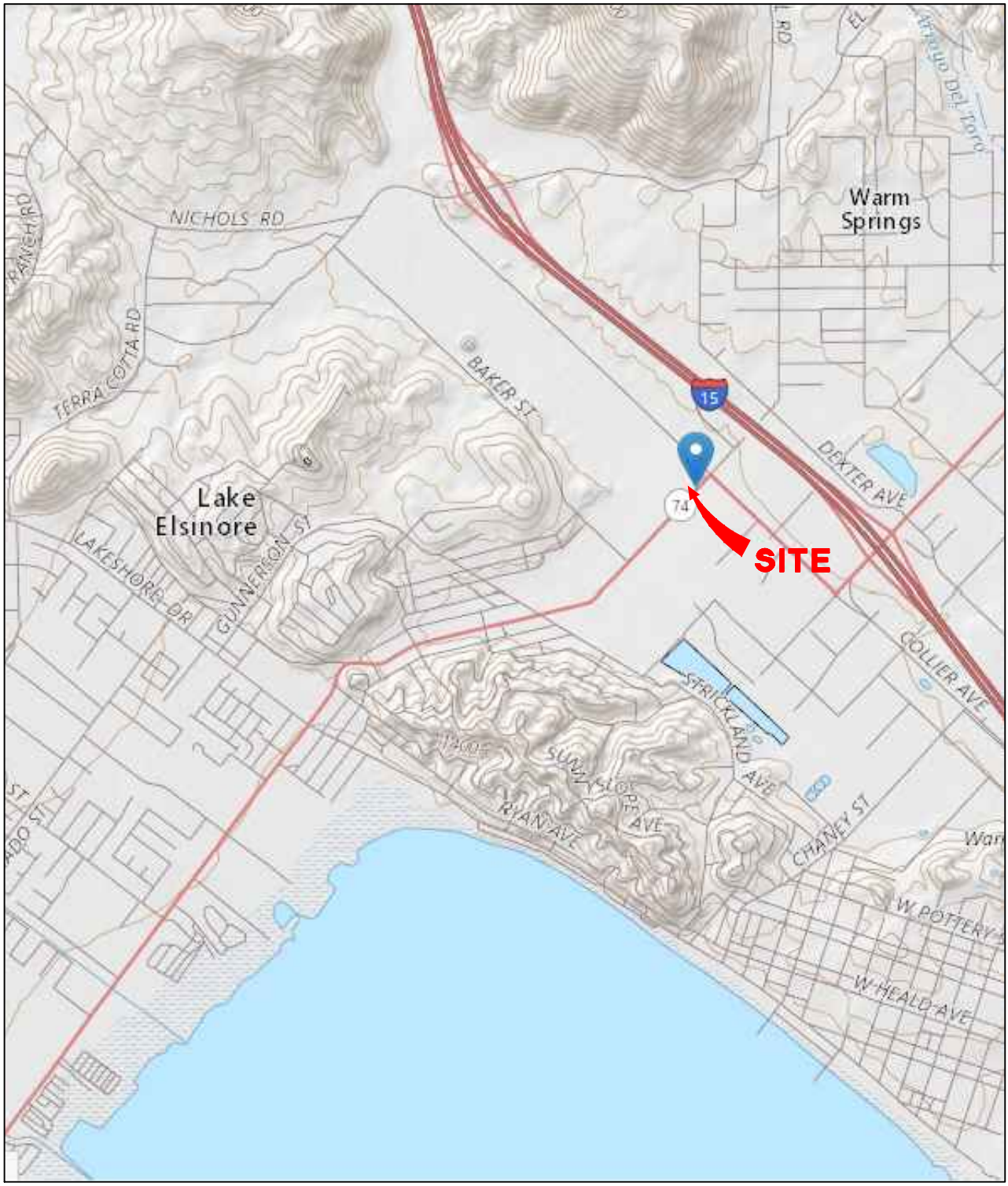


FIGURE 1
SITE VICINITY MAP
NOT TO SCALE

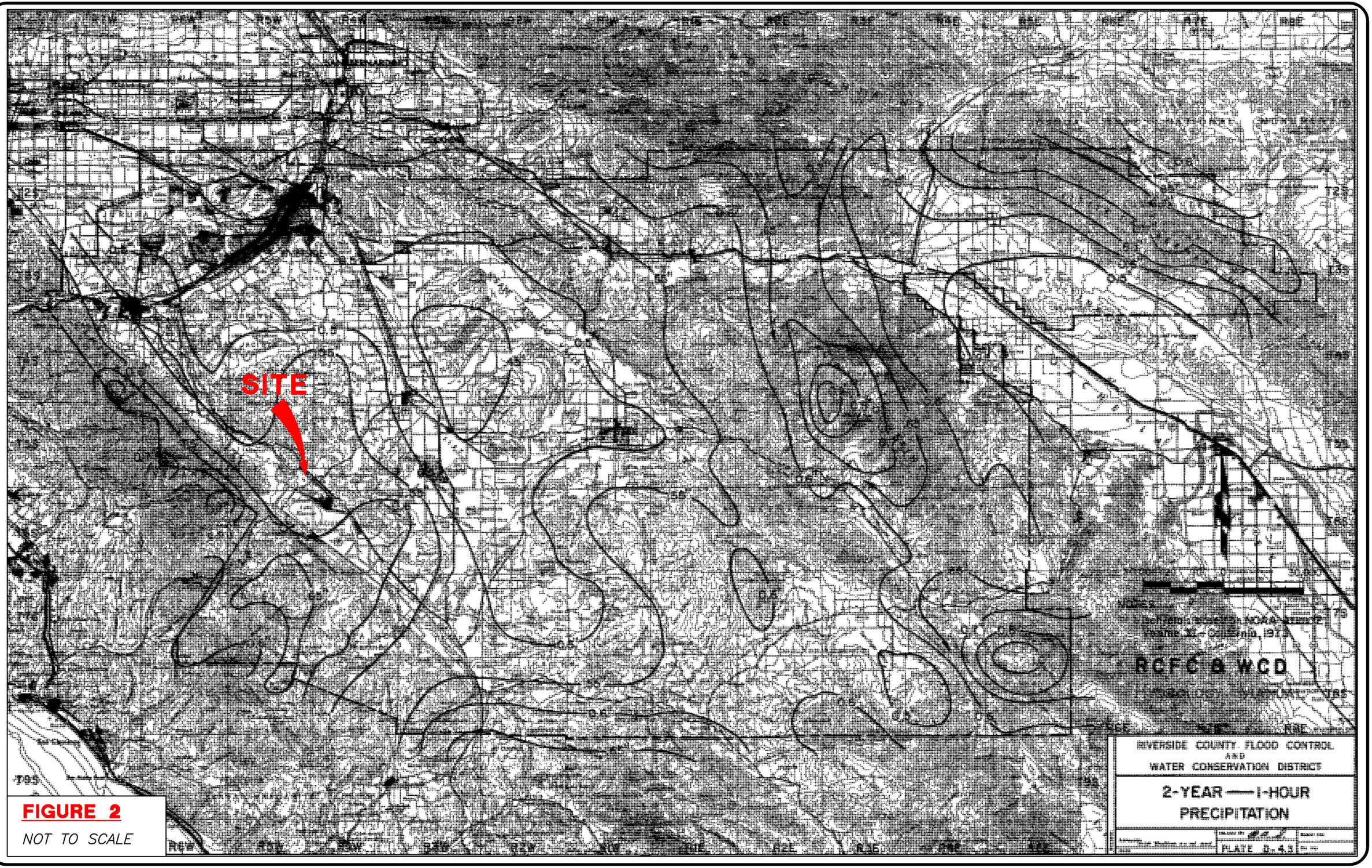


FIGURE 2

NOT TO SCALE

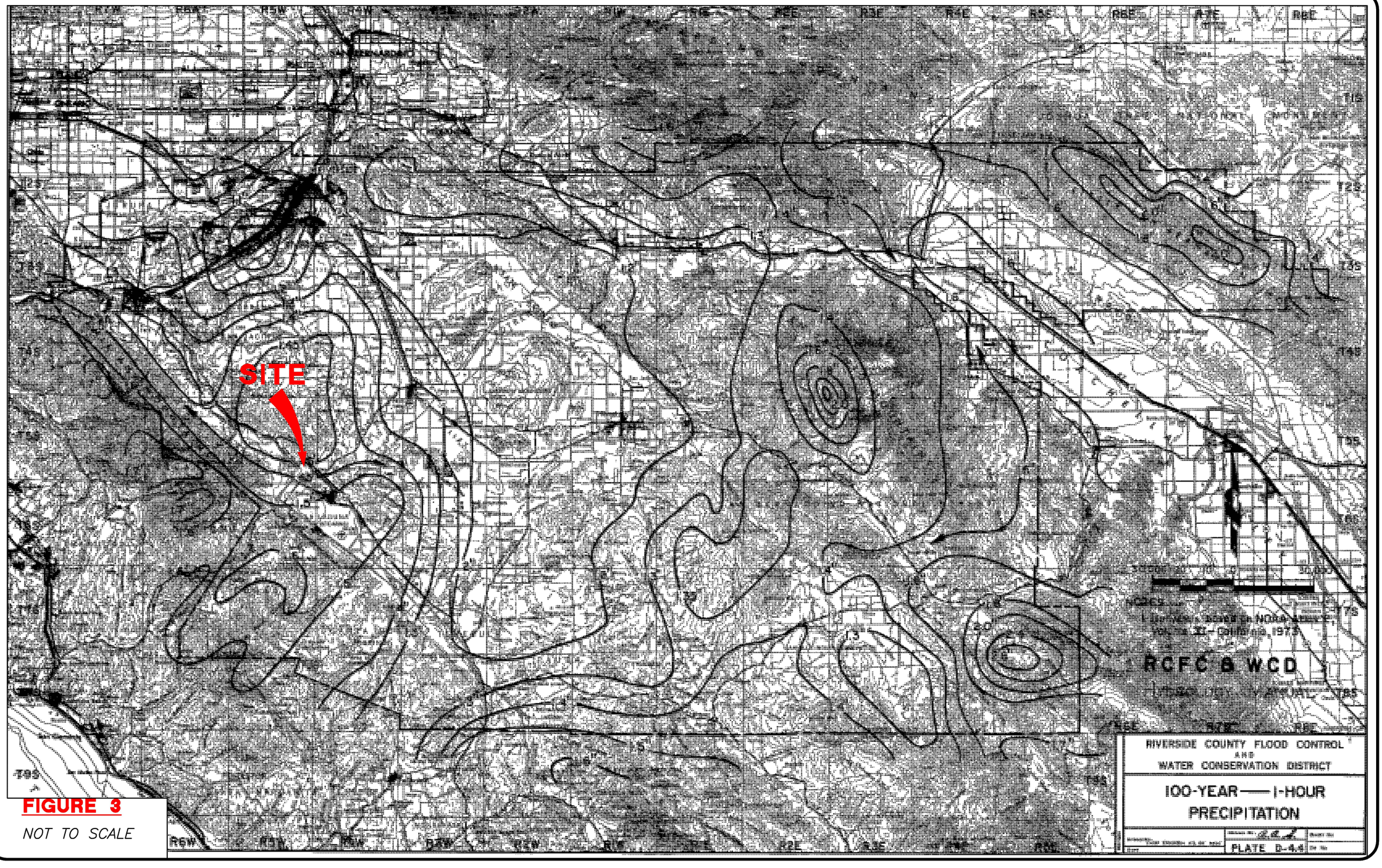
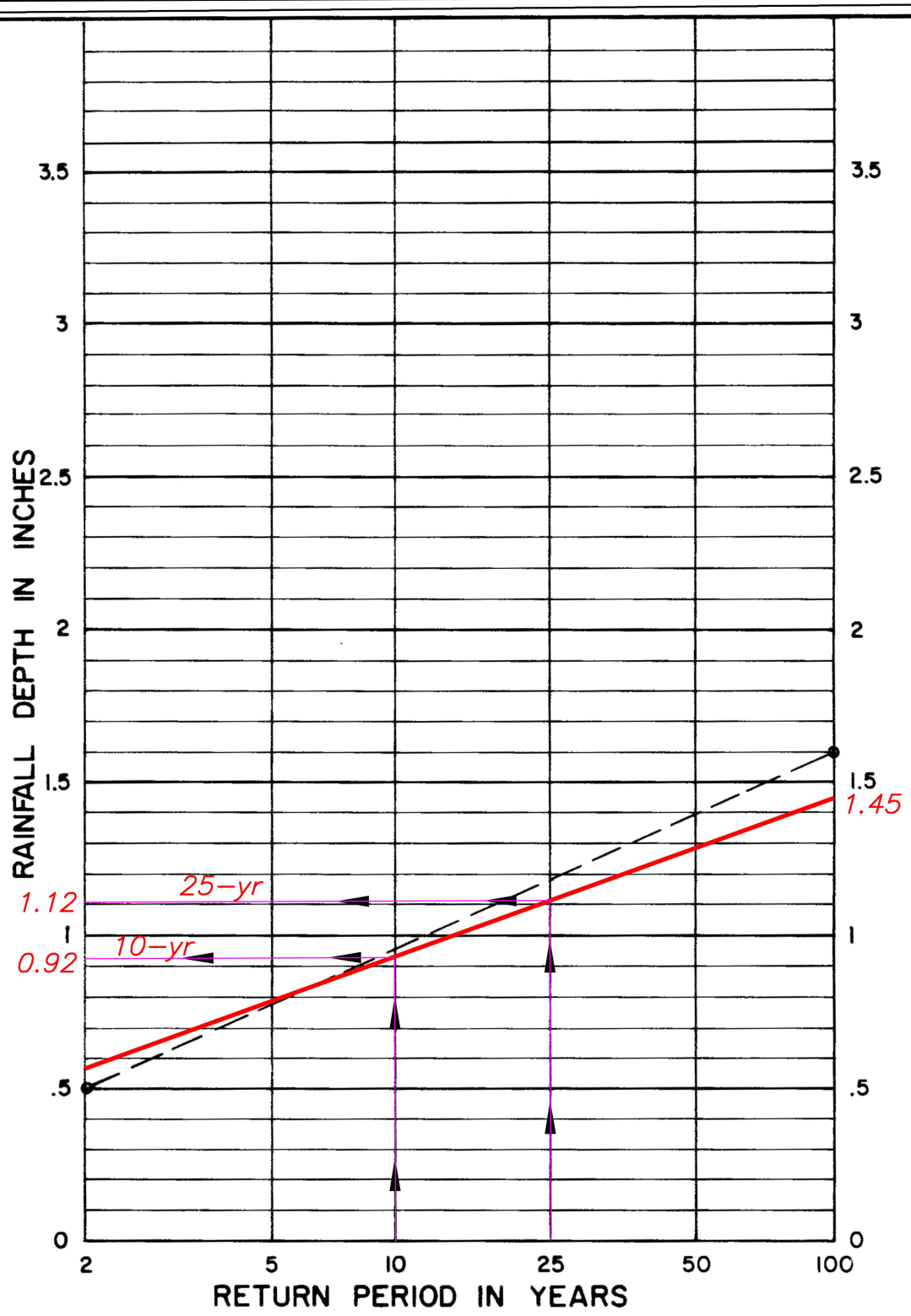


FIGURE 3

NOT TO SCALE



NOTE:

1. For intermediate return periods plot 2-year and 100-year one hour values from maps, then connect points and read value for desired return period. For example given 2-year one hour = .50" and 100-year one hour = 1.60", 25-year one hour = 1.18"

Reference: NOAA Atlas 2, Volume XI - California, 1973.

RCFC & WCD

HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

FIGURE 4

PLATE D-4.5

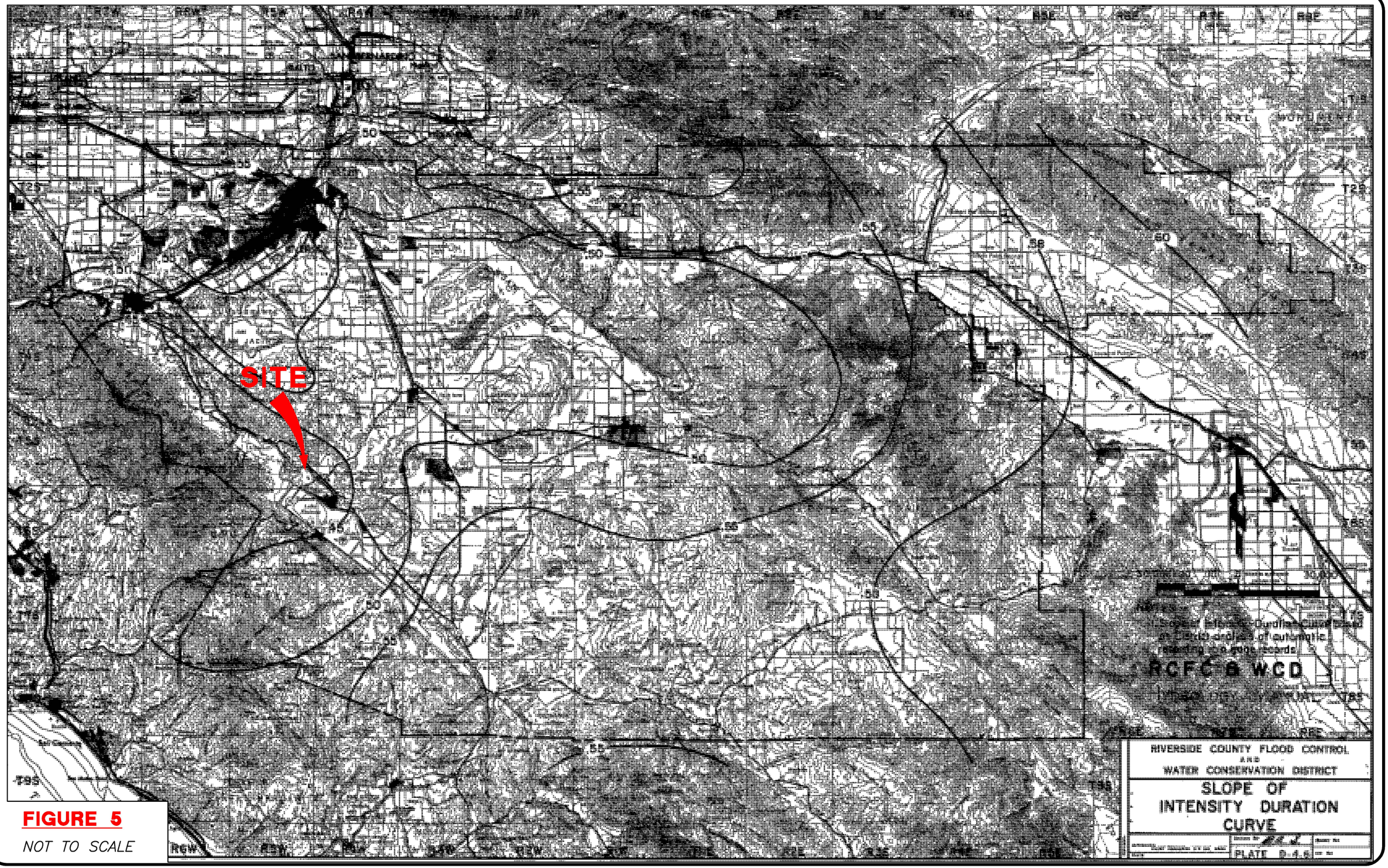
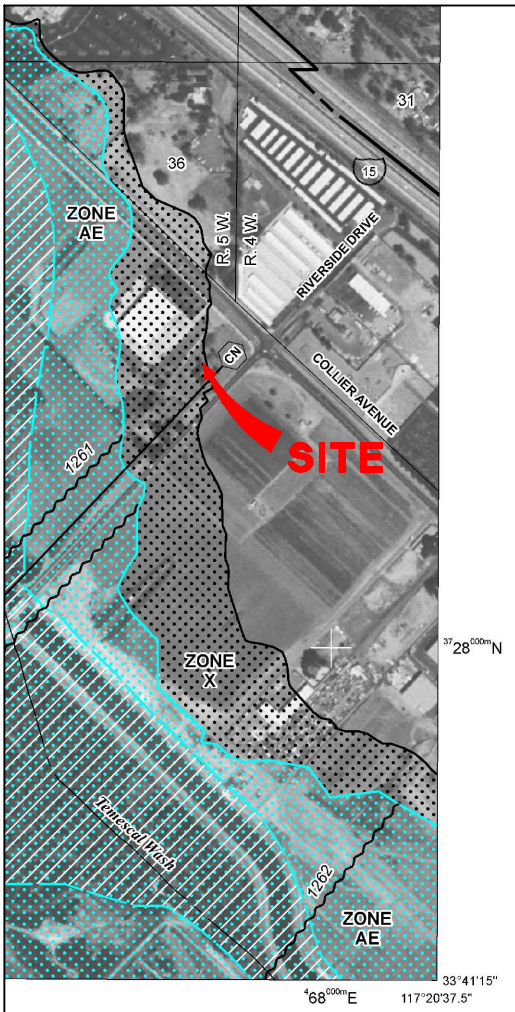


FIGURE 5

NOT TO SCALE



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS 150 0 150 300

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2028G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 2028 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAKE ELSINORE, CITY OF	060636	2028	G
RIVERSIDE COUNTY	060245	2028	G

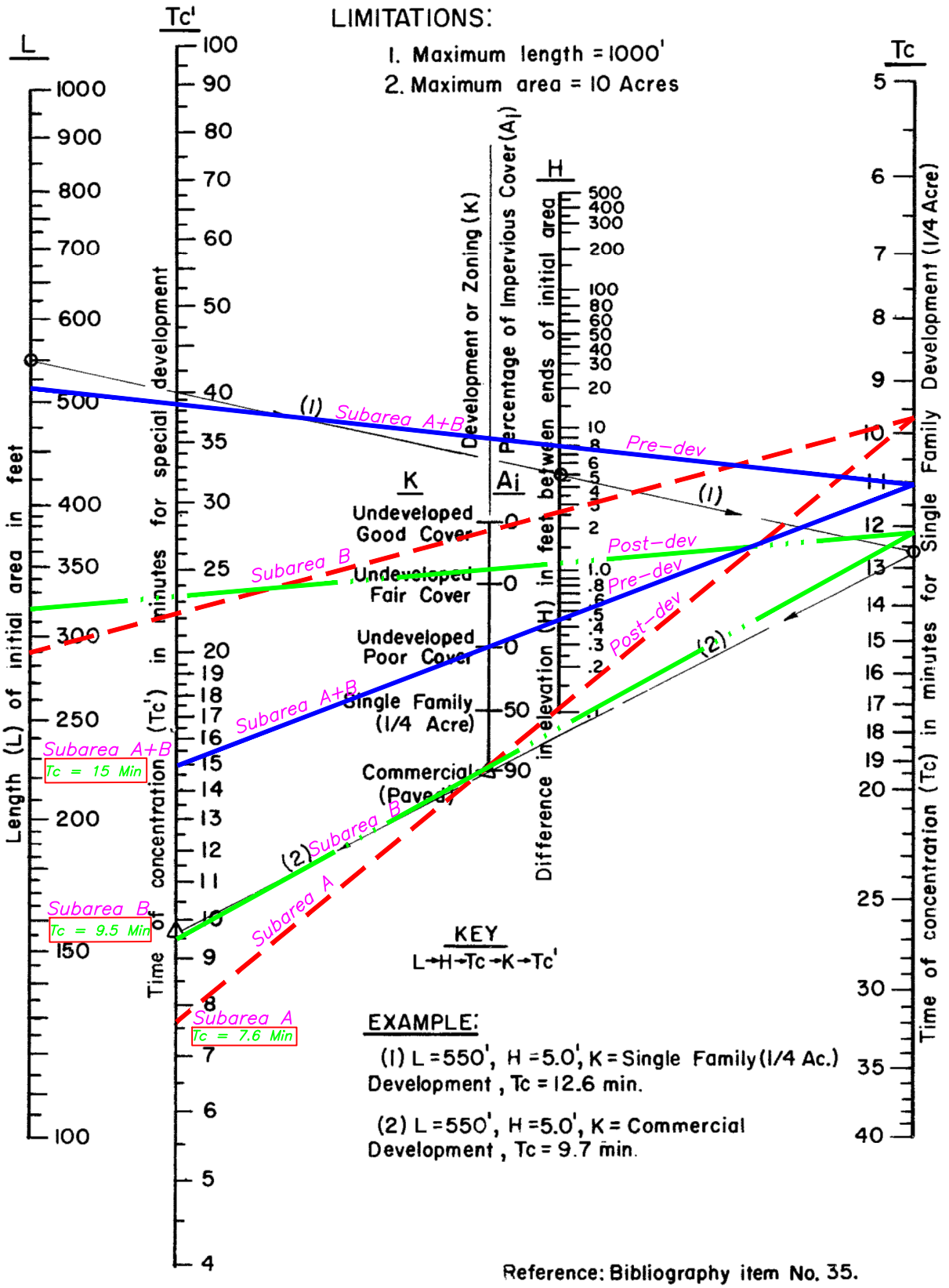
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C2028G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

FIGURE 6
FLOOD INSURANCE RATE MAP (FIRM)
NOT TO SCALE



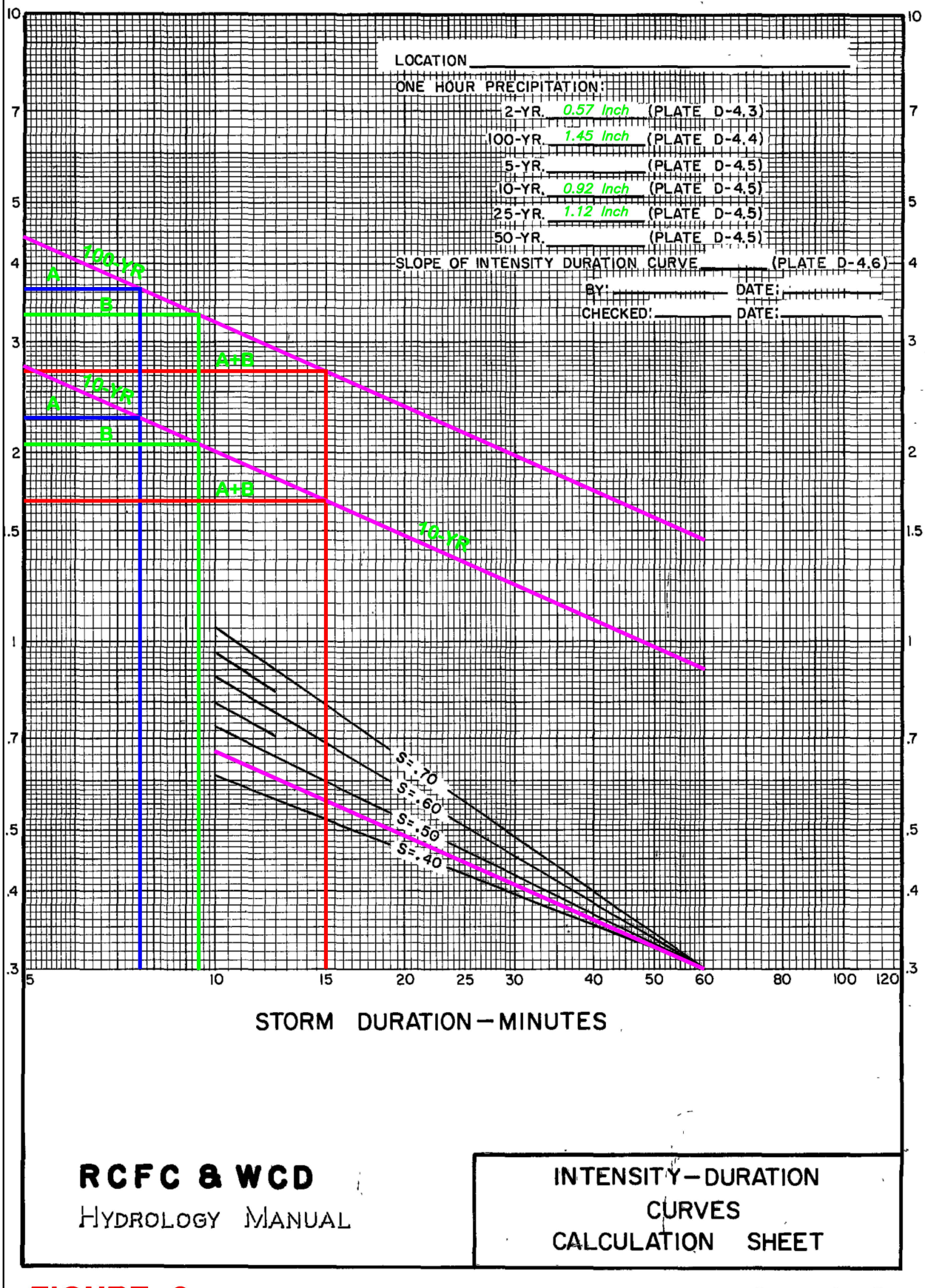
Reference: Bibliography item No. 35.

RCFC & WCD
HYDROLOGY MANUAL

TIME OF CONCENTRATION
FOR INITIAL SUBAREA

FIGURE 7

PLATE D-3



100-YR
I=3.65"/hr
I=3.30"/hr
I=2.82"/hr

10-YR
I=2.26"/hr
I=2.06"/hr
I=1.67"/hr

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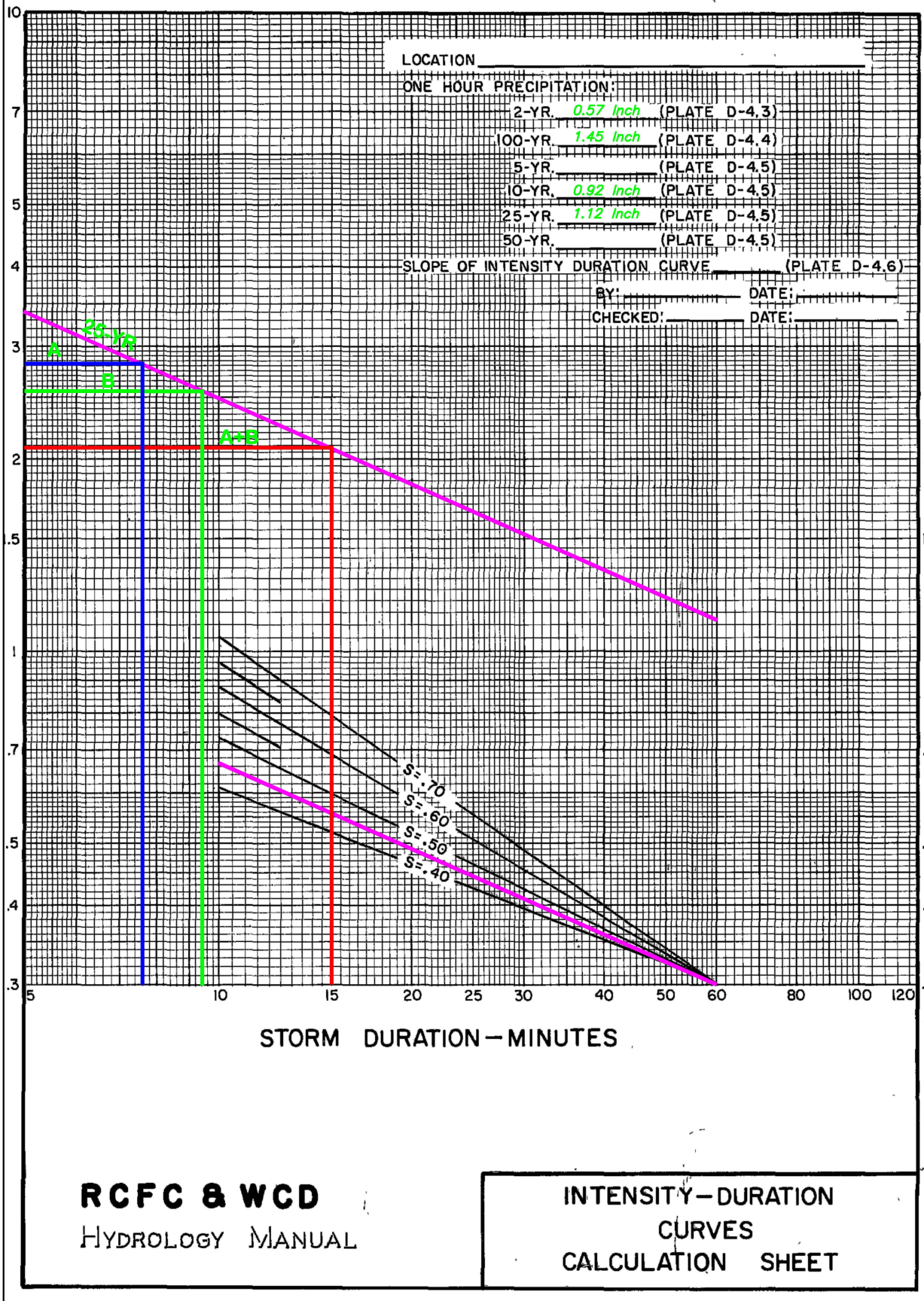
HYDROLOGY MANUAL

INTENSITY-DURATION
CURVES
CALCULATION SHEET

FIGURE 8-a

PLATE D-4.7



25-YR
I=2.82"/hr
I=2.55"/hr
I=2.08"/hr

RCFC & WCD
HYDROLOGY MANUAL

INTENSITY — DURATION
CURVES
CALCULATION SHEET

FIGURE 8-b

PLATE D-4.7

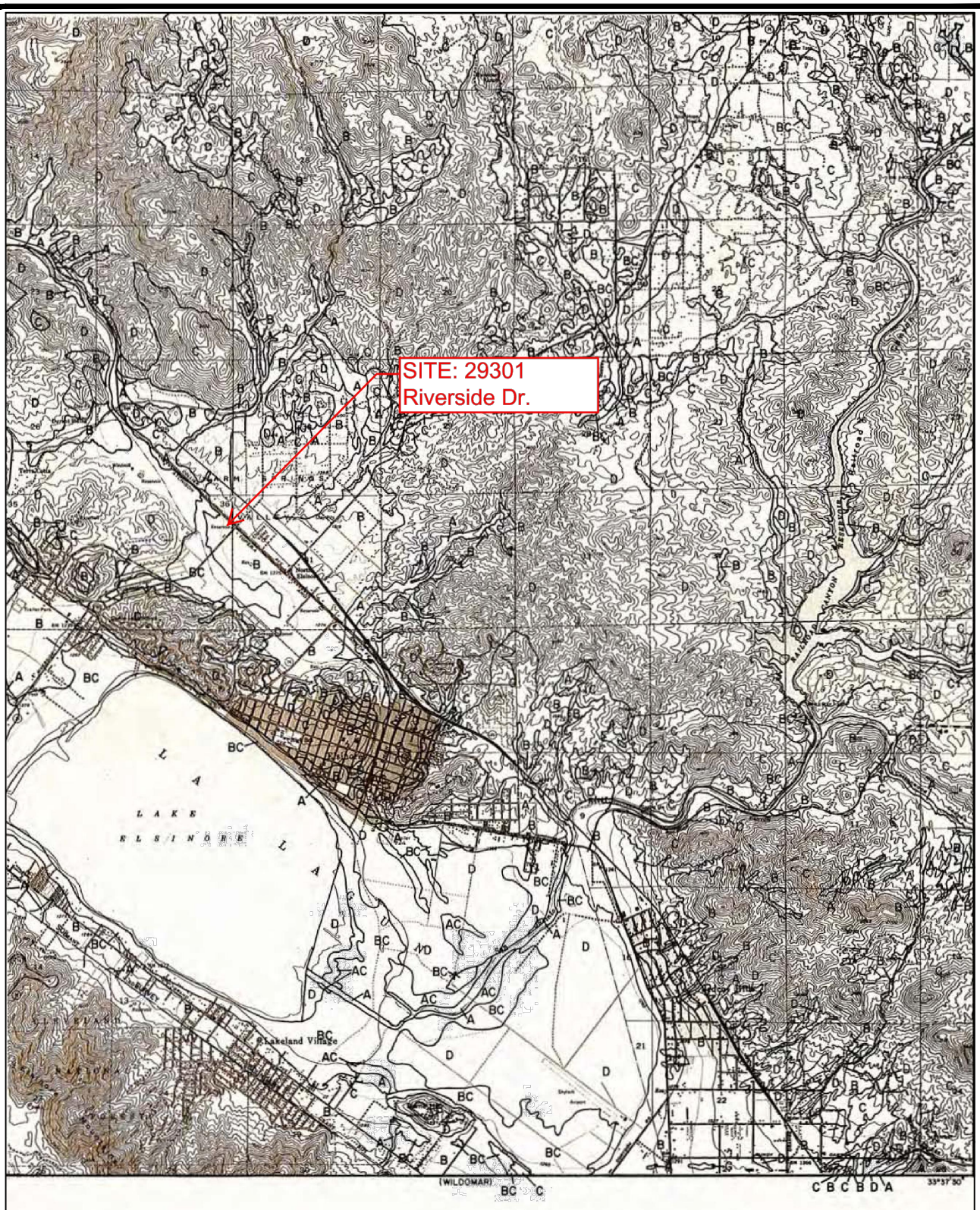
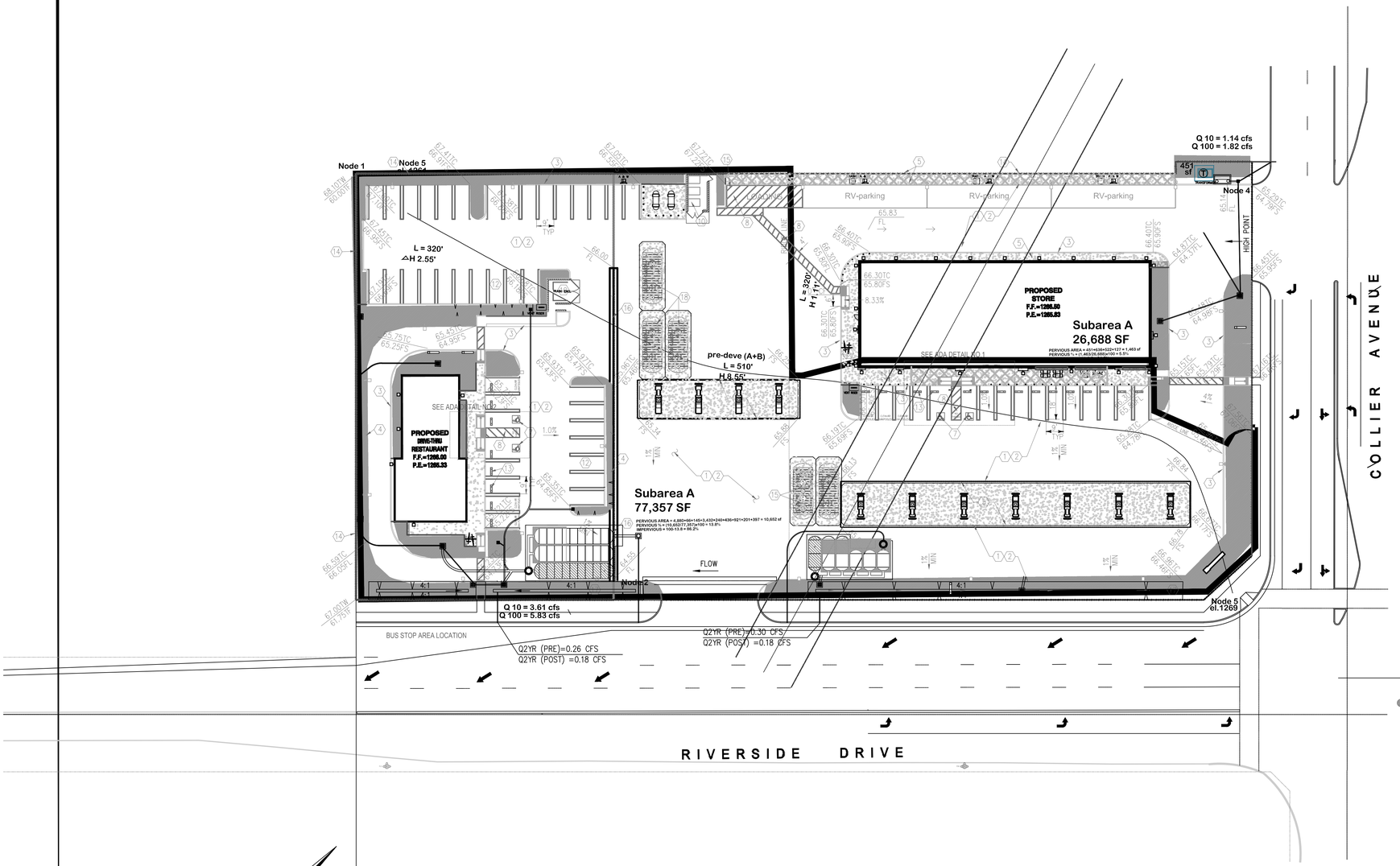

SITE: 29301
Riverside Dr.
LAKE
ELSINORE
Lakeland Village
(WILDOMAR)
LEGEND
SOILS GROUP BOUNDARY
A SOILS GROUP DESIGNATION
RCFC&WCD
HYDROLOGY MANUAL
0 FEET 5000
HYDROLOGIC SOILS GROUP MAP
FOR
ELSINORE
PLATE C-1.41

FIGURE 9



LEGEND

- BLDG./PAVED AREA
- LANDSCAPE
- (17) CONSTRUCTION NOTES (SEE ATTACHED GRADING PLAN)
- (A) OUTLET PIPE, 4" PVC SDR 35

GRAPHIC SCALE

30 0 15 30 60 90

(IN FEET)

1 inch = 30 ft.

Underground Service Alert

Call: TOLL FREE 1-800 227-2600

TWO WORKING DAYS BEFORE YOU DIG

REVISIONS

SEAL: REGISTERED PROFESSIONAL ENGINEER — MOKSUDUR RAHMAN — No. C69263 — Exp. 6-30-18 — CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:

RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:

MOKSUDUR RAHMAN
R.C.E. NO. 36117 EXP. DATE :

ACCEPTED BY:

DATE:

SCALE

Horizontal

1" =30'

Vertical

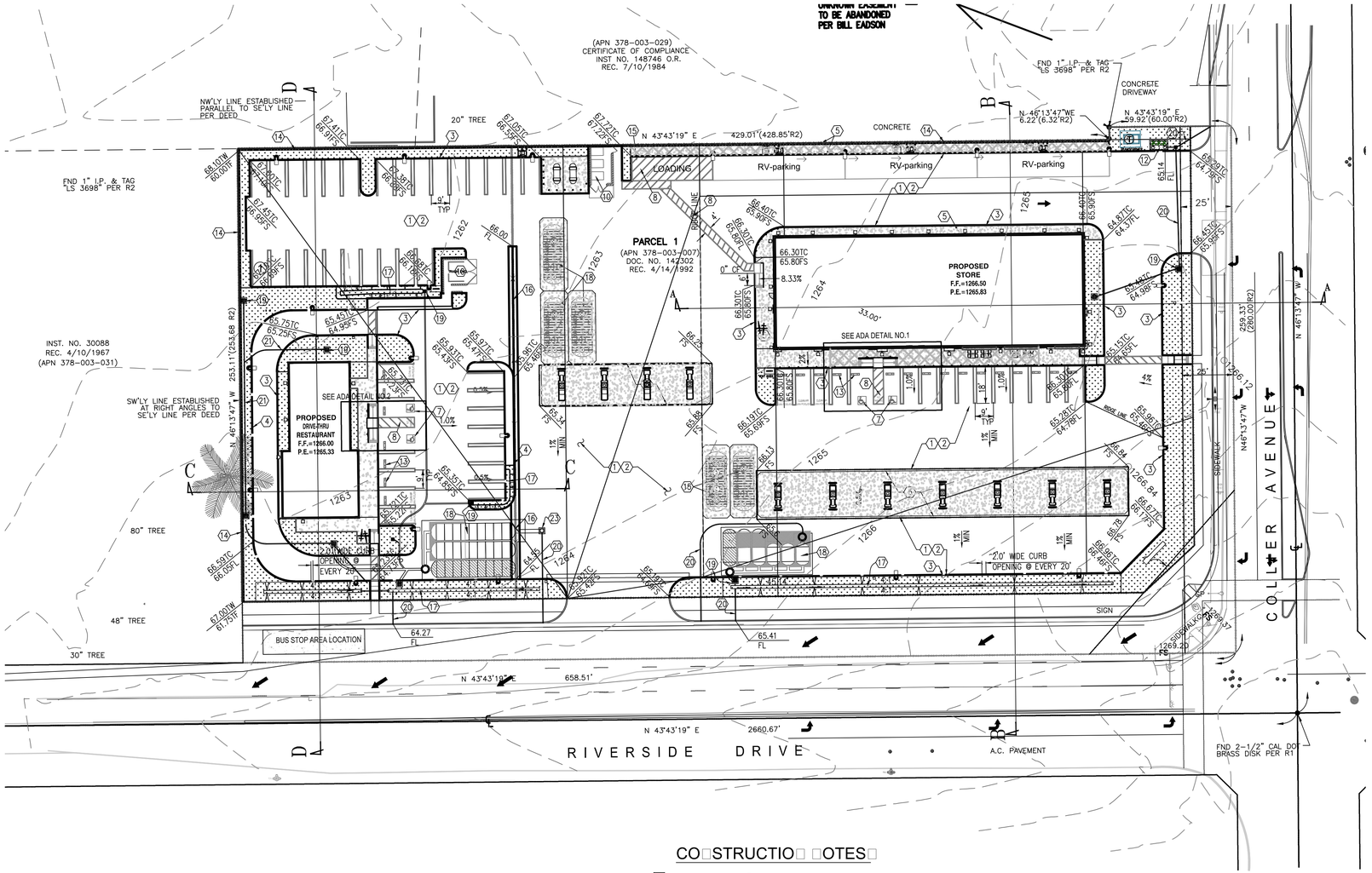
N/A

CITY OF LAKE ELSINORE

HYDROLOGIC SUBAREAS

THE KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CA 92530

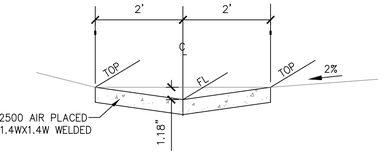
1 OF 1 SHEETS



CONSTRUCTION NOTES

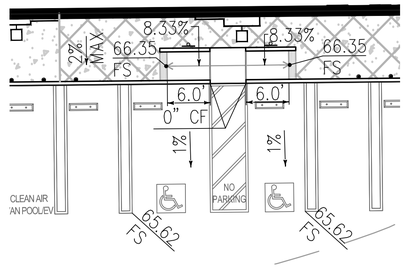
1. CONSTRUCT 3" AC PAVEMENT OR PER SOILS ENGINEER RECOMMENDATIONS
2. CONSTRUCT 6" A.B OR PER SOILS ENGINEER RECOMMENDATIONS
3. CONSTRUCT TYPE 6A CURB PER CITY OF LAKE ELSINORE STD. DWG 202
4. CONSTRUCT TYPE 6 INTERGRAL CURB & GUTTER PER CITY OF LAKE ELSINORE STD. DWG 200
5. CONSTRUCT 4" CONCRETE SLAB/WALKWAY
6. PAINT 4" WHITE SOLID PARKING STRIPES
7. PAINT PAVEMENT ADA MARKING SYMBOL SIGNS
8. PAINT PAVEMENT ADA BLUE HATCH (VAN ACCESSIBLE)
9. INSTALL HANDICAPPED PARKING SIGN
10. CONSTRUCT TRASH ENCLOSURE PER ARCHITECTURAL PLANS.
11. REMOVE EXISTING TREES
12. CONSTRUCT 4'x8' MODULAR WETLAND SYSTEM (MWS-LINEAR) BY BIOCLEAN OR APPROVED EQUAL
13. CONSTRUCT 4' LONG CONCRETE WHEEL STOP
14. CONSTRUCT RETAINING WALL (UNDER SEPARATE PERMIT).
15. UNDERGROUND STORAGE TANKS (BY OYHERS)
16. CONSTRUCT RIBBON GUTTER PER DETAIL HEREON
17. CONSTRUCT BIORETENTION BASIN PER DETAIL PN SHEET 3
18. CONSTRUCT STORMTECH MC-3500 UNDERGROUND CHAMBERS OR APPROVED EQUAL PER DETAIL ON SHEET 3T 3
19. CONSTRUCT 24"x24" JENSEN GRATE INLET OR APPROVED EQUAL W/ FOSSIL FILTER
20. CONSTRUCT 4" PVC PIPE
21. CONSTRUCT 6" PVC PIPE
22. CONSTRUCT 124" PVC PIPE
23. CONSTRUCT 24"x24" JENSEN CONC. MANHOLE OR APPROVED EQUAL W/ FOSSIL FILTER

GRAPHIC SCALE
30 0 15 30 60 90
(IN FEET)
1 inch = 30 ft.



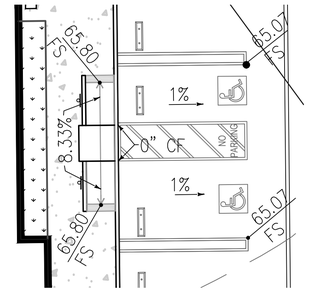
RI□□O□ GUTTER DET□IL

NOT TO SCALE



□D□ DET□IL □O□1

SCALE: 1"=10'



□D□ DET□IL □O□2

SCALE: 1"=10'

NOTE:

1. NO WORK SHALL COMMENCE WITHIN THE ROAD RIGHT OF WAY WITHOUT ISSUANCE OF ENCROACHMENT PERMIT BY TRANSPORTATION DEPARTMENT.
2. SEE STREET IMPROVEMENT PLANS FOR IMPROVEMENTS ALONG RIVERSIDE DRIVE AMD COLLIER AVENUE.

Underground Service Alert
Call: TOLL FREE 1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK
RIVERSIDE COUNTY FLOOD CONTROL DISTRICT BENCHMARK
DESIGNATION: Z 12924
ELEVATION: 1266.57
DESC: FOUND NAIL AND RCFC & WCD TAG FLUSH IN PAVEMENT ON LAKESHORE DRIVE 88 FEET ± EASTERLY OF K-RAILS ON LAKESHORE EASTERLY OF OUTLET

REVISIONS

SEAL: REGISTERED PROFESSIONAL ENGINEER — MOKSUDUR RAHMAN — No. C69263 — Exp. 6-30-20 — CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:
RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:
MOKSUDUR RAHMAN
R.C.E. NO. 36117 EXP. DATE : 6-30-20
ACCEPTED BY:
DATE:

SCALE
Horizontal
1" = 40'
Vertical
N/A

CITY OF LAKE ELSINORE

CONCEPTUAL GRADING PLAN THE KASSAB TRAVEL CENTER 29301 RIVERSIDE DRIVE LAKE ELSINORE, CA 92530

2 OF 3 SHEETS

C:\Land Projects 2004\RRF\2017-PROJECTS\RRF\MR ENGINEERING\KASSAB TRAVEL CENTER\RRF\GRADING\KASSAB-GP-V3.dwg 1-03-19 01:28:32 PM

APPENDICES

APPENDIX A-SOIL COVER TYPE

APPENDIX A

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

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RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

PLATE D-5.5 (1 of 2)

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

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HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

PLATE D-5.6

RUNOFF COEFFICIENT CURVE DATA

The data in the following tables may be used to develop runoff coefficient (C) curves for any combination of runoff index (RI) number and antecedent mositure condition (AMC). For an RI number with an AMC of II (from Plate D-5.5) enter the tables on the following pages and plot the "C" curve data directly on Plate D-5.8. "C" curve data is given for even RI numbers only, but values may easily be interpolated for odd RI numbers.

For an AMC of I or III enter the tabulation on this page with the RI for AMC II, and read the appropriate RI for AMC I or III. Use this revised RI to enter the tables on the following pages to determine "C". For example if RI = 40 for AMC II, then RI = 22 for AMC I and RI = 60 for AMC III.

AMC ADJUSTMENT RELATIONSHIPS

RI FOR AMC II	RI FOR OTHER AMC CONDITIONS: AMC I	AMC III	RI FOR AMC II	RI FOR OTHER AMC CONDITIONS: AMC I	AMC III
10	--	22	55	35	74
11	--	24	56	36	75
12	--	25	57	37	75
13	--	27	58	38	76
14	--	28	59	39	77
15	--	30	60	40	78
16	--	31	61	41	78
17	--	33	62	42	79
18	--	34	63	43	80
19	--	36	64	44	81
20	--	37	65	45	82
21	10	38	66	46	82
22	10	39	67	47	83
23	11	41	68	48	84
24	11	42	69	50	84
25	12	43	70	51	85
26	12	44	71	52	86
27	13	46	72	53	86
28	14	47	73	54	87
29	14	49	74	55	88
30	15	50	75	57	88
31	16	51	76	58	89
32	16	52	77	59	89
33	17	53	78	60	90
34	18	54	79	62	91
35	18	55	80	63	91
36	19	56	81	64	92
37	20	57	82	66	92
38	21	58	83	67	93
39	21	59	84	68	93
40	22	60	85	70	94
41	23	61	86	72	94
42	24	62	87	73	95
43	25	63	88	75	95
44	25	64	89	76	96
45	26	65	90	78	96
46	27	66	91	80	97
47	28	67	92	81	97
48	29	68	93	83	98
49	30	69	94	85	98
50	31	70	95	87	98
51	31	70	96	89	99
52	32	71	97	91	99
53	33	72	98	94	99
54	34	73	99	97	--

APPENDIX B-RUNOFF COEFFICIENT

APPENDIX B

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF COEFFICIENT
CURVE DATA

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 84

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.60	.72	.77	.80	.82	.83	.84	.85	.86	.86
5.	.04	.61	.73	.78	.80	.82	.83	.84	.85	.86	.87
10.	.09	.63	.74	.78	.81	.83	.84	.85	.85	.86	.87
15.	.13	.64	.75	.79	.81	.83	.84	.85	.85	.86	.87
20.	.18	.66	.75	.80	.82	.83	.84	.85	.86	.87	.87
25.	.22	.67	.76	.80	.82	.84	.85	.85	.86	.87	.87
30.	.27	.69	.77	.81	.83	.84	.85	.86	.86	.87	.87
35.	.31	.70	.78	.82	.83	.85	.85	.86	.87	.87	.88
40.	.36	.72	.79	.82	.84	.85	.86	.86	.87	.87	.88
45.	.40	.73	.80	.83	.84	.85	.86	.87	.87	.88	.88
50.	.45	.75	.81	.83	.85	.86	.86	.87	.87	.88	.88
55.	.49	.76	.82	.84	.85	.86	.87	.87	.88	.88	.88
60.	.54	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
65.	.58	.79	.84	.85	.86	.87	.88	.88	.88	.88	.89
70.	.63	.81	.85	.86	.87	.88	.88	.88	.88	.89	.89
75.	.67	.82	.85	.87	.87	.88	.88	.88	.89	.89	.89
80.	.72	.84	.86	.87	.88	.88	.89	.89	.89	.89	.89
85.	.76	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
90.	.81	.87	.88	.89	.89	.89	.89	.89	.89	.90	.90
95.	.86	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 86

10-Yr Rainfall

100-Yr Rainfall

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.63	.74	.79	.81	.83	.84	.85	.85	.86	.87
5.	.04	.64	.75	.79	.82	.83	.84	.85	.86	.86	.87
10.	.09	.65	.76	.80	.82	.84	.85	.85	.86	.87	.87
15.	.13	.67	.76	.80	.83	.84	.85	.86	.86	.87	.87
20.	.18	.68	.77	.81	.83	.84	.85	.86	.86	.87	.87
25.	.22	.70	.78	.81	.83	.85	.85	.86	.87	.87	.88
30.	.27	.71	.79	.82	.84	.85	.86	.86	.87	.87	.88
35.	.31	.72	.80	.83	.84	.85	.86	.87	.87	.88	.88
40.	.36	.74	.80	.83	.85	.86	.86	.87	.87	.88	.88
45.	.40	.75	.81	.84	.85	.86	.87	.87	.87	.88	.88
50.	.45	.76	.82	.84	.86	.86	.87	.87	.88	.88	.88
55.	.49	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
60.	.54	.79	.84	.85	.86	.87	.88	.88	.88	.89	.89
65.	.58	.80	.84	.86	.87	.87	.88	.88	.88	.89	.89
70.	.63	.82	.85	.87	.87	.88	.88	.88	.89	.89	.89
75.	.67	.83	.86	.87	.88	.88	.88	.89	.89	.89	.89
80.	.72	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
85.	.76	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
90.	.81	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
95.	.86	.89	.89	.89	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 88

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.66	.76	.80	.82	.84	.85	.86	.86	.87	.87
5.	.04	.67	.77	.81	.83	.84	.85	.86	.86	.87	.87
10.	.09	.68	.78	.81	.83	.85	.85	.86	.86	.87	.88
15.	.13	.70	.78	.82	.84	.85	.86	.86	.87	.87	.88
20.	.18	.71	.79	.82	.84	.85	.86	.86	.87	.87	.88
25.	.22	.72	.80	.83	.84	.85	.86	.87	.87	.88	.88
30.	.27	.73	.80	.83	.85	.86	.86	.87	.87	.88	.88
35.	.31	.74	.81	.84	.85	.86	.87	.87	.87	.88	.88
40.	.36	.76	.82	.84	.85	.86	.87	.87	.88	.88	.88
45.	.40	.77	.82	.85	.86	.87	.87	.88	.88	.88	.89
50.	.45	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
55.	.49	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
60.	.54	.80	.84	.86	.87	.88	.88	.88	.88	.89	.89
65.	.58	.82	.85	.87	.87	.88	.88	.88	.89	.89	.89
70.	.63	.83	.86	.87	.87	.88	.88	.88	.89	.89	.89
75.	.67	.84	.87	.88	.88	.88	.89	.89	.89	.89	.89
80.	.72	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
85.	.76	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
90.	.81	.88	.89	.89	.89	.89	.90	.90	.90	.90	.90
95.	.86	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 90

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.69	.78	.82	.84	.85	.86	.86	.87	.87	.88
5.	.04	.70	.79	.82	.84	.85	.86	.87	.87	.88	.88
10.	.09	.71	.80	.83	.84	.85	.86	.87	.87	.88	.88
15.	.13	.73	.80	.83	.85	.86	.86	.87	.87	.88	.88
20.	.18	.74	.81	.84	.85	.86	.87	.87	.87	.88	.88
25.	.22	.75	.81	.84	.85	.86	.87	.87	.88	.88	.88
30.	.27	.76	.82	.84	.86	.86	.87	.87	.88	.88	.88
35.	.31	.77	.82	.85	.86	.87	.87	.88	.88	.88	.89
40.	.36	.78	.83	.85	.86	.87	.87	.88	.88	.88	.89
45.	.40	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
50.	.45	.80	.84	.86	.87	.87	.88	.88	.88	.89	.89
55.	.49	.81	.85	.86	.87	.88	.88	.88	.89	.89	.89
60.	.54	.82	.85	.87	.88	.88	.88	.89	.89	.89	.89
65.	.58	.83	.86	.87	.88	.88	.89	.89	.89	.89	.89
70.	.63	.84	.87	.88	.88	.88	.89	.89	.89	.89	.89
75.	.67	.85	.87	.88	.88	.89	.89	.89	.89	.89	.89
80.	.72	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
85.	.76	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
90.	.81	.88	.89	.89	.89	.89	.90	.90	.90	.90	.90
95.	.86	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENT CURVE DATA

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 92

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.73	.81	.84	.85	.86	.87	.87	.87	.88	.88
5.	.04	.74	.81	.84	.85	.86	.87	.87	.88	.88	.88
10.	.09	.75	.82	.84	.86	.86	.87	.87	.88	.88	.88
15.	.13	.76	.82	.85	.86	.87	.87	.88	.88	.88	.89
20.	.18	.76	.83	.85	.86	.87	.87	.88	.88	.88	.89
25.	.22	.77	.83	.85	.86	.87	.87	.88	.88	.88	.89
30.	.27	.78	.83	.85	.87	.87	.88	.88	.88	.89	.89
35.	.31	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
40.	.36	.80	.84	.86	.87	.88	.88	.88	.88	.89	.89
45.	.40	.81	.85	.86	.87	.88	.88	.88	.89	.89	.89
50.	.45	.82	.85	.87	.88	.88	.88	.89	.89	.89	.89
55.	.49	.82									
60.	.54	.83									
65.	.58	.84	.87	.88	.88	.89	.89				
70.	.63	.85	.87	.88	.89	.89	.89	.89	.89	.89	.89
75.	.67	.86	.88	.88	.89	.89	.89	.89	.89	.89	.90
80.	.72	.87	.88	.89	.89	.89	.89	.89	.89	.90	.90
85.	.76	.87	.89	.89	.89	.89	.89	.90	.90	.90	.90
90.	.81	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
95.	.86	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

10-Yr Rainfall

100-Yr Rainfall

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 94

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.77	.83	.85	.86	.87	.88	.88	.88	.88	.89
5.	.04	.78	.83	.85	.87	.87	.88	.88	.88	.89	.89
10.	.09	.78	.84	.86	.87	.87	.88	.88	.88	.89	.89
15.	.13	.79	.84	.86	.87	.87	.88	.88	.88	.89	.89
20.	.18	.80	.84	.86	.87	.88	.88	.88	.89	.89	.89
25.	.22	.80	.85	.86	.87	.88	.88	.88	.89	.89	.89
30.	.27	.81	.85	.87	.87	.88	.88	.89	.89	.89	.89
35.	.31	.81	.85	.87	.88	.88	.88	.89	.89	.89	.89
40.	.36	.82	.86	.87	.88	.88	.89	.89	.89	.89	.89
45.	.40	.83	.86	.87	.88	.88	.89	.89	.89	.89	.89
50.	.45	.83	.86	.88	.88	.89	.89	.89	.89	.89	.89
55.	.49	.84	.87	.88	.88	.89	.89	.89	.89	.89	.89
60.	.54	.85	.87	.88	.89	.89	.89	.89	.89	.89	.89
65.	.58	.85	.88	.88	.89	.89	.89	.89	.89	.89	.90
70.	.63	.86	.88	.89	.89	.89	.89	.89	.89	.90	.90
75.	.67	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
80.	.72	.87	.89	.89	.89	.89	.90	.90	.90	.90	.90
85.	.76	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
90.	.81	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
95.	.86	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 96

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.81	.85	.87	.88	.88	.88	.89	.89	.89	.89
5.	.04	.81	.85	.87	.88	.88	.88	.89	.89	.89	.89
10.	.09	.82	.86	.87	.88	.88	.89	.89	.89	.89	.89
15.	.13	.82	.86	.87	.88	.88	.89	.89	.89	.89	.89
20.	.18	.83	.86	.87	.88	.88	.89	.89	.89	.89	.89
25.	.22	.83	.86	.88	.88	.89	.89	.89	.89	.89	.89
30.	.27	.84	.87	.88	.88	.89	.89	.89	.89	.89	.89
35.	.31	.84	.87	.88	.88	.89	.89	.89	.89	.89	.89
40.	.36	.85	.87	.88	.89	.89	.89	.89	.89	.89	.90
45.	.40	.85	.87	.88	.89	.89	.89	.89	.89	.89	.90
50.	.45	.85	.88	.88	.89	.89	.89	.89	.89	.90	.90
55.	.49	.86	.88	.89	.89	.89	.89	.89	.89	.90	.90
60.	.54	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
65.	.58	.87					89				
70.	.63	.87					90				
75.	.67	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
80.	.72	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
85.	.76	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
90.	.81	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
95.	.86	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

10-Yr Rainfall

100-Yr Rainfall

RUNOFF COEFFICIENTS FOR RI INDEX NO. = 98

IMPERVIOUS PERCENT	INTENSITY - INCHES/HOUR										
	.0	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0
0.	.00	.85	.88	.88	.89	.89	.89	.89	.89	.90	.90
5.	.04	.86	.88	.88	.89	.89	.89	.89	.89	.90	.90
10.	.09	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
15.	.13	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
20.	.18	.86	.88	.89	.89	.89	.89	.89	.90	.90	.90
25.	.22	.87	.88	.89	.89	.89	.89	.89	.90	.90	.90
30.	.27	.87	.88	.89	.89	.89	.89	.90	.90	.90	.90
35.	.31	.87	.88	.89	.89	.89	.89	.90	.90	.90	.90
40.	.36	.87	.89	.89	.89	.89	.90	.90	.90	.90	.90
45.	.40	.87	.89	.89	.89	.89	.90	.90	.90	.90	.90
50.	.45	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
55.	.49	.88	.89	.89	.89	.90	.90	.90	.90	.90	.90
60.	.54	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
65.	.58	.88	.89	.89	.90	.90	.90	.90	.90	.90	.90
70.	.63	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
75.	.67	.89	.89	.90	.90	.90	.90	.90	.90	.90	.90
80.	.72	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
85.	.76	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90
90.	.81	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
95.	.86	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90
100.	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90	.90

APPENDIX C-DESIGN CALCULATIONS

Subarea A

Hydraulic Analysis Report

Project Data

Project Title:

Designer:

Project Date: Sunday, December 31, 2017

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width: 3.0000 ft

Longitudinal Slope: 0.0300 ft/ft

Manning's n: 0.0130

Flow: 4.5100 cfs

Result Parameters

Depth: 0.2253 ft

Area of Flow: 0.6758 ft^2

Wetted Perimeter: 3.4505 ft

Hydraulic Radius: 0.1958 ft

Average Velocity: 6.6739 ft/s

Top Width: 3.0000 ft

Froude Number: 2.4780

Critical Depth: 0.4125 ft

Critical Velocity: 3.6445 ft/s

Critical Slope: 0.0046 ft/ft

Critical Top Width: 3.00 ft

Calculated Max Shear Stress: 0.4217 lb/ft^2

Calculated Avg Shear Stress: 0.3666 lb/ft^2

Subarea B

Hydraulic Analysis Report

Project Data

Project Title:

Designer:

Project Date: Tuesday, January 02, 2018

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Circular

Pipe Diameter: 0.3300 ft

Longitudinal Slope: 0.0500 ft/ft

Manning's n: 0.0090

Flow: 0.5000 cfs

Result Parameters

Depth: 0.2306 ft

Area of Flow: 0.0638 ft^2

Wetted Perimeter: 0.6534 ft

Hydraulic Radius: 0.0977 ft

Average Velocity: 7.8319 ft/s

Top Width: 0.3028 ft

Froude Number: 3.0057

Critical Depth: 0.3251 ft

Critical Velocity: 5.8639 ft/s

Critical Slope: 0.0317 ft/ft

Critical Top Width: 0.08 ft

Calculated Max Shear Stress: 0.7196 lb/ft^2

Calculated Avg Shear Stress: 0.3049 lb/ft^2

Appendix I

Project Specific Water Quality Management Plan

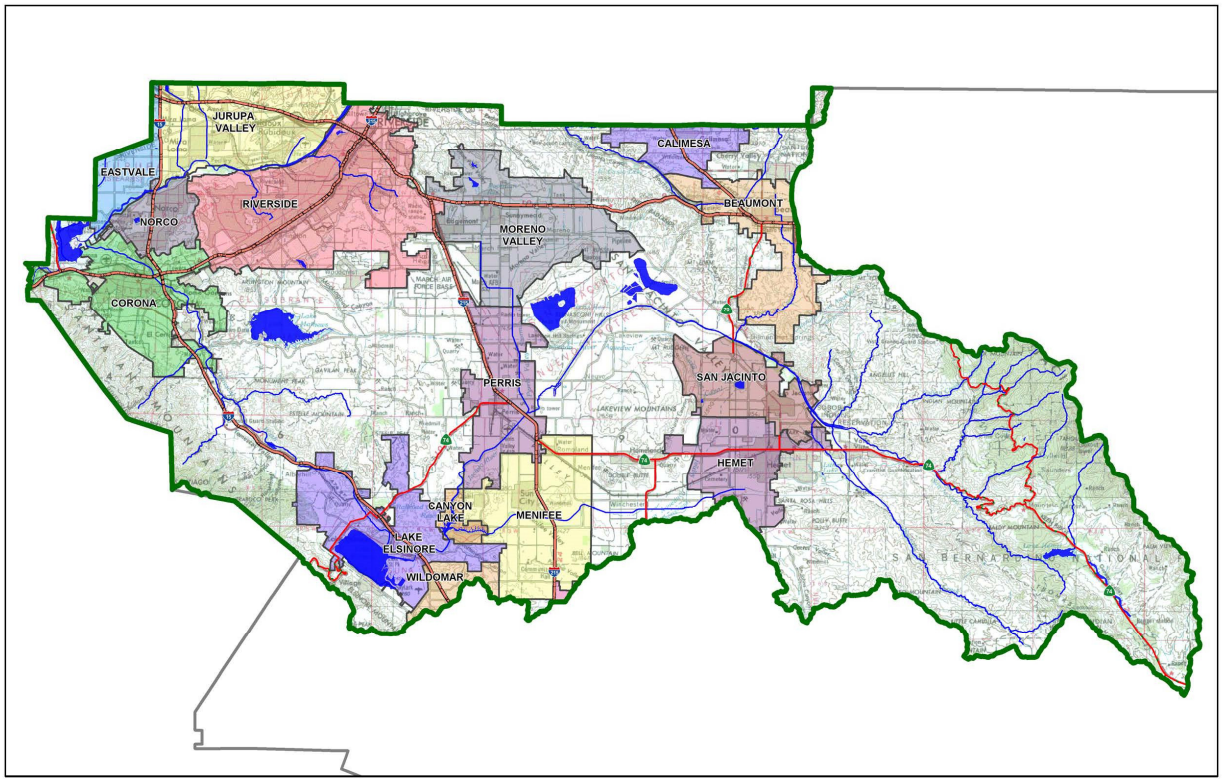
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: KASSAB TRAVEL CENTER

Development No: PA-2016-00112

Design Review/Case No: PWQMP-2018-00001



☒ **Preliminary**
☐ **Final**

Original Date Prepared: JULY 15, 2017

Revision Date(s): October 4, 2018
December 27, 2018

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

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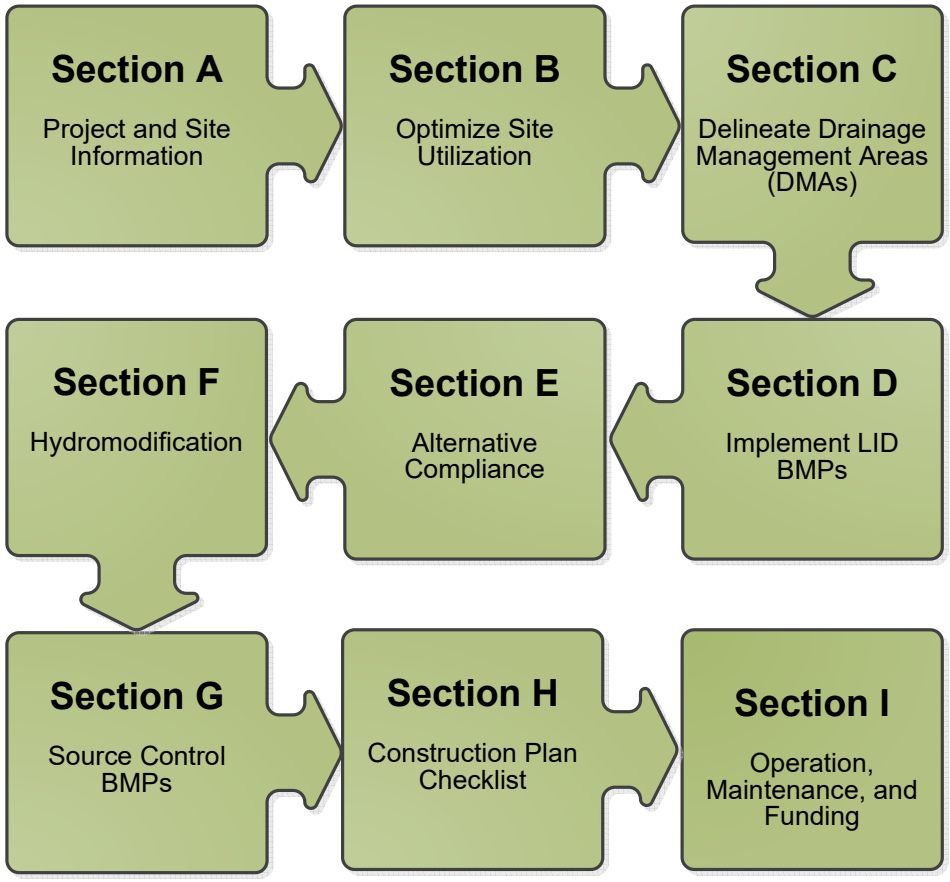
A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Ron Kassab by Moksud Rahman, PE for the Kassab Travel Center facility project.

This WQMP is intended to comply with the requirements of CITY OF LAKE ELSINORE for ORD. # (Municipal Code Section 754.2), which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under CITY OF LAKE ELSINORE Water Quality Ordinance (Municipal Code Section 754.2).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

↗Owner's Signature

12/21/2018

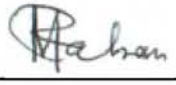
Date

Ron Kassab

Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."



Preparer's Signature

Date:

Moksudur Rahman , PE

Professional Civil Engineer

Preparer's Licensure: PE C69263

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	COMMERCIAL
Planning Area:	I-15 CORRIDOR
Community Name:	LAKE ELSINORE
Development Name:	I-15 CORRIDOR/ NORTH ELSINORE
PROJECT LOCATION	
Latitude & Longitude (DMS): LAT: 33º 41' 41.65" Long: 117º 20' 49.64"	
Project Watershed and Sub-Watershed: Santa Ana River , Temescal Reach	
APN(s): 378-030-007 & 009	
Map Book and Page No.: Page 866 Grid C1 & C2	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Commercial
Proposed or Potential SIC Code(s)	
Area of Impervious Project Footprint (SF)	92,011 SF
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	92,011 SF
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	0
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	N/A
What is the Water Quality Design Storm Depth for the project?	0.70

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
TEMESCAL WASH	PH, INDICATOR BACTERIA	REC1, REC2, WARM, WILD	RARE (5.4 MILES)
SANTA ANA RIVER	COPPER, LEAD, PATHOGENS, INDICATOR BACTERIA, PATHOGENS	AGR, GWR, REC1, REC2, WARM, WILD, RARE	RARE

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☐ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* City of Lake Elsinore Grading permit City of Lake Elsinore Building permit	☒ Y	☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

NO. EXISTING DRAINAGE PATTERN WAS NOT PRESERVE BECAUSE ADJACENT PROPERTIES WOULD NOT ALLOW TO ACCEPT THE INCREASE RUNOFF SO PROJECT WAS DESIGN TO FLOW TOWARDS THE LANDSACPE AREAS THEN OUT TO THE STREETS.

Did you identify and protect existing vegetation? If so, how? If not, why?

NO. WHOLE SITE WILL BE DEVELOPED.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

YES, BY CONCENTRATING THE DEVELOPMENT ON PORTIONS OF THE SITE WITH LESS PERMEABLE SOIL AND PRESERVE THE SITE THAT CAN PROMOTE INFILTRATION. SOME LANDSCAPE AREAS ARE CONSIDERED SELF TREATING AREAS WHICH PRESERVE NATURAL INFILTRATION AND SOME AREAS BIORETENTION BMP WILL BE CONSTRUCTED.

Did you identify and minimize impervious area? If so, how? If not, why?

YES, BY INCORPORATING LANDSCAPE AREAS TO MINIMIZE IMPERVIOUS AREAS

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

YES, ALL DRAINAGE FLOWS WILL BE CAPTURED BY THE PROPOSED RIBBON GUTTERS TOWARDS TO THE PROPOSED BMPS.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DMA "A"	Mixed type (A.C pavement, landscape	27,456	TYPE "D"
DMA "B"	Mixed type (A.C pavement, landscape, Roof)	26,397	TYPE "D"
DMA "C"	Landscape	1,457	TYPE "A"
DMA "D"	Mixed type (A.C pavement, landscape	5,536	TYPE "D"
DMA "E"	Mixed type (A.C pavement, landscape	3,383	TYPE "D"
DMA "F"	Mixed type (A.C pavement, landscape, roof)	4,697	TYPE "D"
DMA "G"	Mixed type (A.C pavement, landscape	5,672	TYPE "D"
DMA "H"	Mixed type (A.C pavement, landscape	29,939	TYPE "D"

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA "C"	1,457	GRASS VEGETATION	SPRINKLER SYSTEM

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name / ID	[C] from Table C.4 =	Required Retention Depth (inches)
		[A]	[B]		[C]	[D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product		Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]	DMA name /ID	[D]	[C]/[D]

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA A	LANDSCAPE AREAS/BIORETENTION
DMA B	BIOFILTRATION (PROPRIETARY)
DMA D	BIORETENTION
DMA E	LANDSCAPE AREAS
DMA F	LANDSCAPE AREAS
DMA G	BIORETENTION
DMA H	LANDSCAPE AREAS/BIORETENTION

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: A, B, D, G & H	X	
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment –

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: _____0.29 ac_____

Type of Landscaping (Conservation Design or Active Turf): ___CONSERVATION DESIGN

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 0.25ac

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: 1.32

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: _____0.33_____AC

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	**Available Irrigated Landscape (Step 1)**
_____0.33_____AC	_____0.29_____ AC

Note: The proposed project cannot meet or exceed the minimum ratio, therefore Harvest and use is not feasible.

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: ____35_____

Project Type: COMMERCIAL

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 0.25 AC

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 150

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: _____37.5_____

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
_____37.5_____	_____35__

Note: The proposed project cannot meet or exceed the minimum demand, therefore Harvest and use is not feasible.

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

N/A

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: N/A

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: N/A

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: N/A

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required useN/A

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
N/A	N/A

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

X LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA A	☐	☐	☒	☐	☐
DMA B	☐	☐	☐	☒	☐
	☐	☐	☐	☐	☐
DMA D	☐	☐	☒	☐	☐
DMA E	☐	☐	☒	☐	☐
DMA F	☐	☐	☒	☐	☐
DMA G	☐		☒		
DMA H			☒		

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Insert narrative description here.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Areas x Runoff Factor**	***Enter BMP Name / Identifier Here*** ***BIO-RETENTION NO.1***		
	[A]		[B]	[C]	[A] x [C]			
DMA A	*27,456*	*MIXED TYPE*	*0.86*	*0.67*	*18,396*	*Design Storm Depth (in)*	*Design Capture Volume,* ***V_{BMP}*** *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	27,456				18,396	0.70	1080.30	1,140

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

NOTE: THE DMA RUMOFF FACTOR WAS AUTOMATICALLY CALCULATED FRPM THE WORKSHEET FOR CALCULATING THE VOLUME bmp, SEE APPENDIX 6.

						Modular wetlands		
DMA B	26,327	MIXED TYPE	0.96	0.82	21,588	0.70	1267.7	1500

						BIORETENTION		
DMA D	5,536	MIXED TYPE	1.0	0.89	4,927	0.70	288.10	312

+

						BIORETENTION		
DMA E	3,383	A.C PVMT	0.42	0.29	981.07	0.70	60.80	176

						BIORETENTION		
DMA F	4,697	A.C PVMT	0.64	0.44	2066.60	0.70	120.8	121

						BIORETENTION		
DMA G	5,612	A.C PVMT	0.62	0.42	2357	0.70	139.0	176

						BIORETENTION		
DMA H	29,939	MIX TYPE	0.95	.81	24,251	0.70	1409.30	1410

IMPERVIOUS FRACTION CALCULATION

A. DMA-A

TOTAL AREA = 0.63 AC
A.C PAVEMENT = 0.53 AC
LANDSCAPING = 0.10 AC

If= (0.63)(1.0) + (0.53)(1.0) + (0.10)(0.10) / 0.63

IMPERVIOUS FRACTION (If) = 0.86

B. DMA-B

TOTAL AREA = 0.61AC
A.C PAVEMENT and ROOF= 0.58 AC
LANDSCAPING = 0.03 AC

If= (0.58)(1.0) + (0.03)(0.10) /0.61

IMPERVIOUS FRACTION (If) = 0.96

C. DMA-D

TOTAL AREA = 0.12 AC
A.C PAVEMENT=0.12 AC

If= (0.12)(1.0) / 0.12

IMPERVIOUS FRACTION (If) = 1.0

D. DMA-E

TOTAL AREA = 0.11AC
A.C PAVEMENT=0.04
LANDSCAPING = 0.07AC

If= (0.04)(1.0)+(0.07)(0.10) / 0.11

IMPERVIOUS FRACTION (If) = 0.42

E. DMA-F

TOTAL AREA = 0.11 AC
A.C PAVEMENT AND ROOF=0.07

If= 0.07)(1.0) / 0.11

IMPERVIOUS FRACTION (If) = 0.64

F. DMA-G

TOTAL AREA = 0.13 AC
A.C PAVEMENT =0.11
LANDSCAPING = 0.02AC

If= 0.11)(1.0)+(0.02)(0.1) / 0.13

IMPERVIOUS FRACTION (If) = 0.62

G. DMA-H

TOTAL AREA = 0.69 AC
A.C PAVEMENT AND ROOF=0.65
LANDSCAPING=0.04 AC

If= 0.65)(1.0)+(0.04)(0.10) / 0.69

IMPERVIOUS FRACTION (If) = 0.95

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address some of the Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

List DMAs here.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☒ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☒ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☒	☒	☐	☐	☐	☐	☐	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
Total Credit Percentage[1]	

[1]Cannot Exceed 50%

[2]Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Area x Runoff Factor**		***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12

[H] is from the Total Credit Percentage as Calculated from Table E.2 above

[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
Modular Wetlands	Bacterial Indicators, Metals, Trash & Debris	90%

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.
[2] Cross Reference Table E.1 above to populate this column.
[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	N/A	N/A	N/A
Volume (Cubic Feet)	N/A	N/A	N/A

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

HCOC IS MITIGATED BY ACHIEVING CONDITION C. DISCHARGE FROM THE SITE WAS LIMITED TO A FLOW RATE NOT GREATER THAN 10% OF THE PRE-DEVELOPED 2 YEAR PEAK FLOW. SEE APPENDIX 7 FOR SUPPORTING CALCULATIONS.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm Drain Inlets	*Mark all Inlets " Only Rain Down the storm drain*	*-Maintain and periodically repaint or replace inlet markings* *-Provide stormwater pollution prevention information to new site owners, lessees or operators* *-Include in Lease agreement: "Tenant shall not allow anyone to discharge anything to storm drains or store or deposit materials so as to create a potential discharge to storm drains".*
Landscape/Outdoor Pesticide Use	*Design Landscaping to Minimize Irrigation and Runoff, to promote*	*Maintain Landscaping using minimum or no pesticides.*

	surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution	
Parking lots, sidewalks, plazas		*Sweep parking lots regularly to prevent accumulation of liter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer and not to storm drain.* *Sweep plazas, sidewalks and parking lots regularly to prevent accumulation of liter and debris. Collect debris from presuure washing to prevent entry to storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to sanitary sewer not to storm drain.*
Roofings, Gutters & Trims	Avoid roofing. Gutters & trim made of copper and other unprotected metals that may leach into runoff.	

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)
BMP NO.1	LANDSCAPE AREA/BIORETENTION	SHT 2 OF GRADING PLANS
BMP NO. 2	BIOCLEAN MODULAR WETLANDS	SHT 2 OF GRADING PLANS
BMP NO.3	LANDSCAPE	SHTC 2 OF GRADING PLAN
BMP NO.4	BIORETENTION	SHT 2 OF GRADING PLAN
BMP NO.5	LANDSCAPE AREA	SHT 2 OF GRADING PLAN
BMP NO.6	LANDSCAPE AREA	SHT 2 OF GRADING PLANS
BMP NO.7	BIORETENTION	SHT 2 OF GRADING PLAN
BMP NO.8	LANDSCAPE AREA/BIORETENTION	SHT 2 OF GRADING PLAN

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: Insert text here.

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

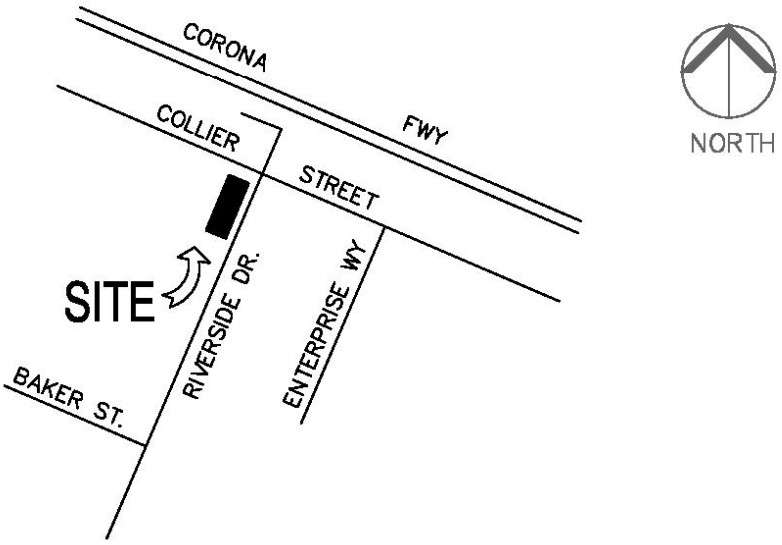
☒ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

THIS SECTION WILL BE ADDRESSED AND COMPLETED AT THE TIME OF FINAL WQMP SUBMITTAL.

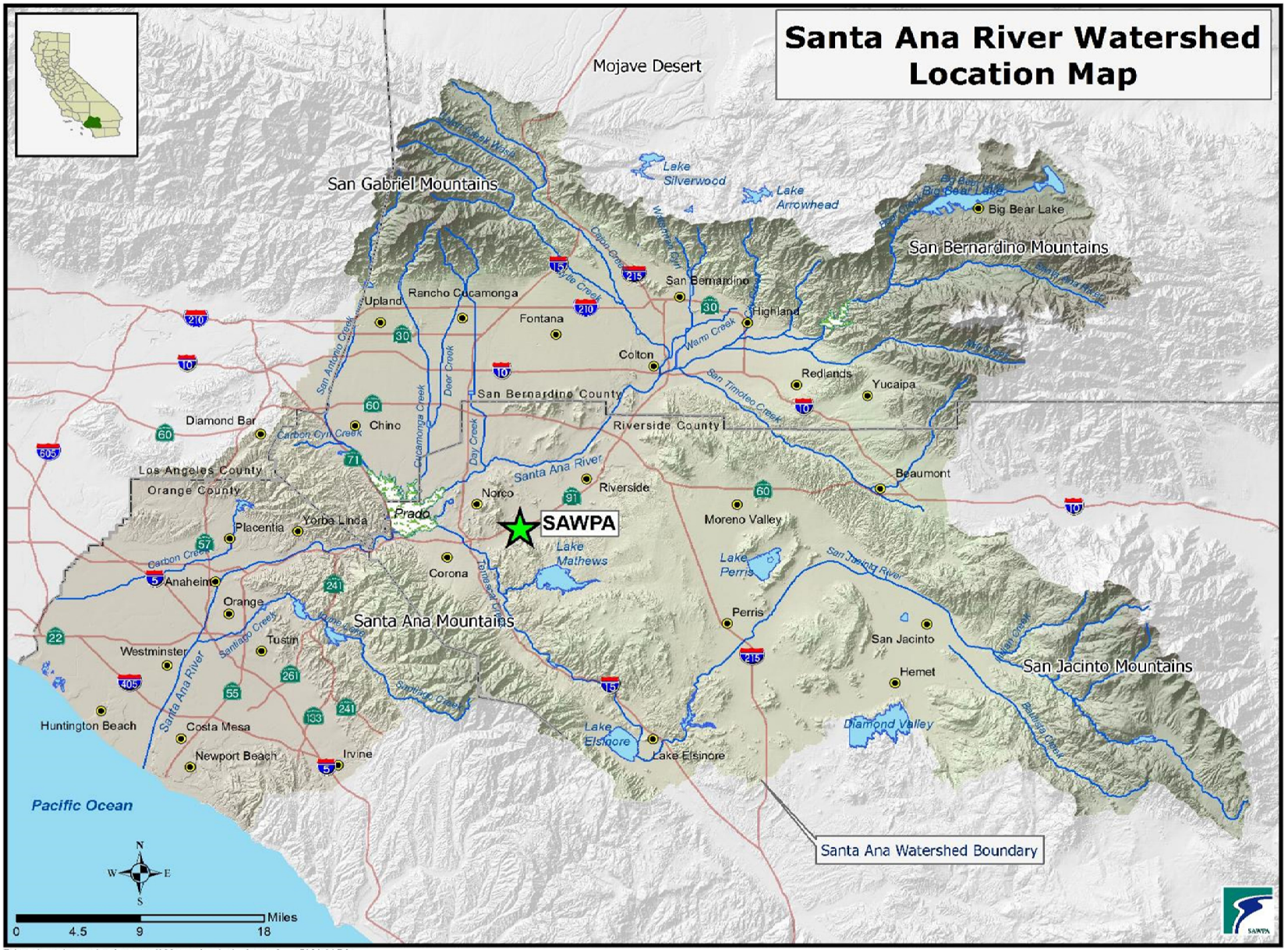
Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map



VICINITY MAP:

NOT TO SCALE


Santa Ana River Watershed
Location Map
Mojave Desert
San Gabriel Mountains
San Bernardino Mountains
San Jacinto Mountains
Santa Ana Mountains
Lake Silverwood
Lake Arrowhead
Big Bear Lake
Rancho Cucamonga
Upland
Fontana
San Bernardino
Highland
Colton
Redlands
Yucaipa
San Bernardino County
Riverside County
Los Angeles County
Orange County
Diamond Bar
Chino
Norco
Riverside
Prado
SAWPA
Lake Mathews
Lake Perris
Moreno Valley
Beaumont
Placentia
Yorba Linda
Corona
Anaheim
Orange
Tustin
Westminster
Perris
San Jacinto
Hemet
Huntington Beach
Costa Mesa
Newport Beach
Irvine
Lake Elsinore
Diamond Valley
Pacific Ocean
Santa Ana River
Santa Ana Watershed Boundary
N
W
E
S
Miles
0
4.5
9
18
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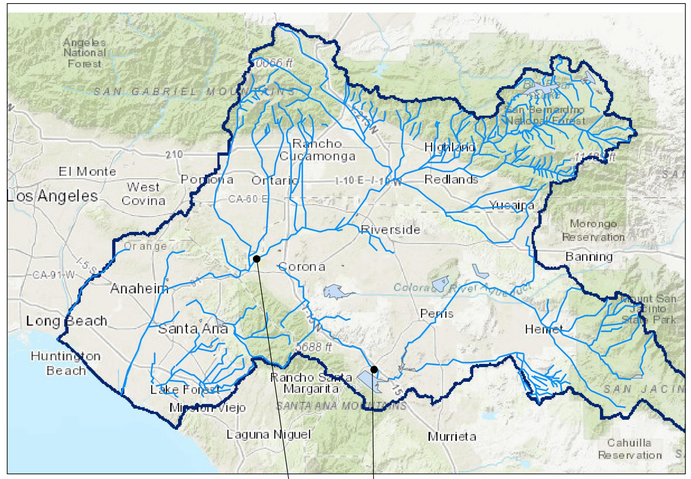
□ □□ □MP SITE PL□□



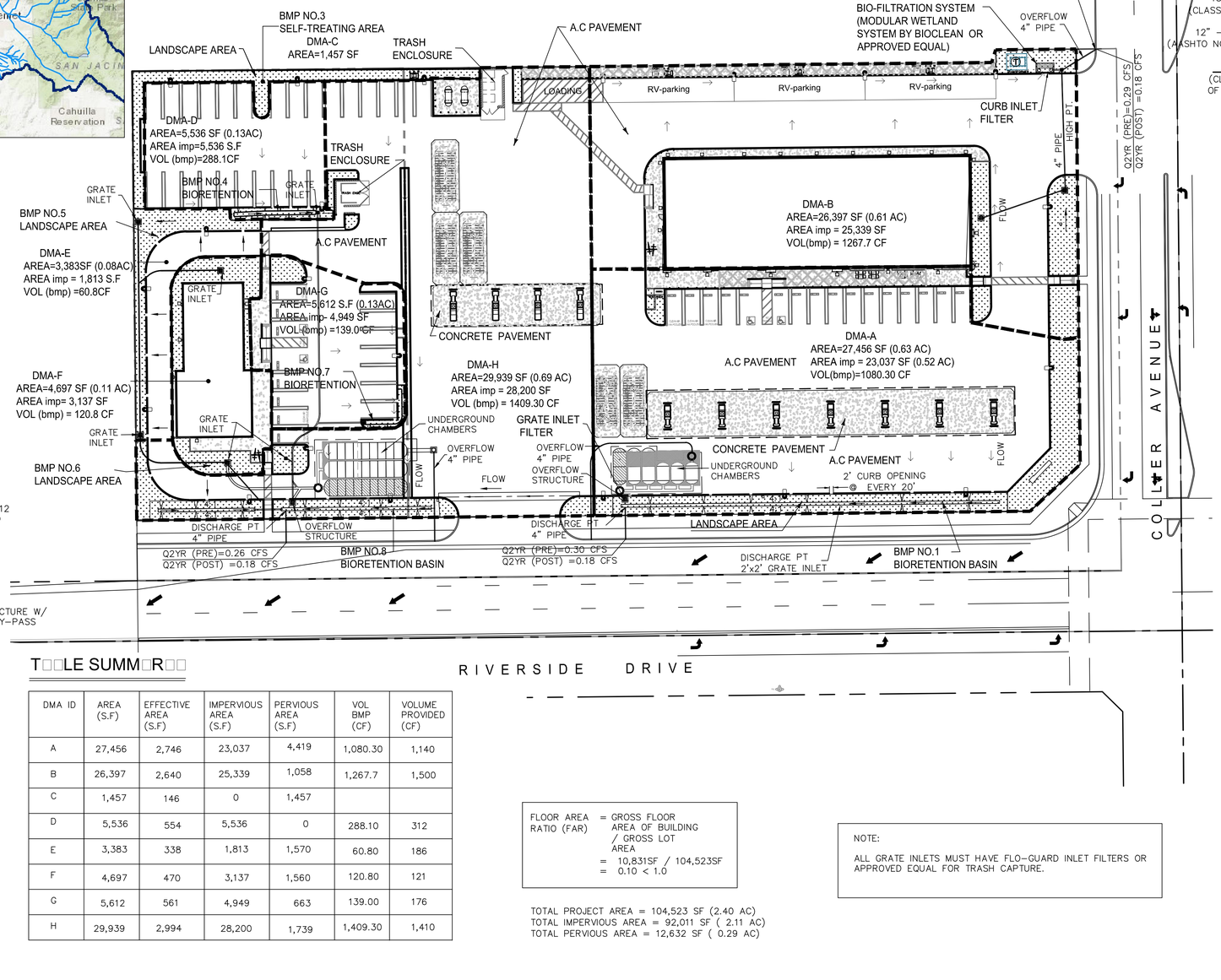
LOCATION MAP

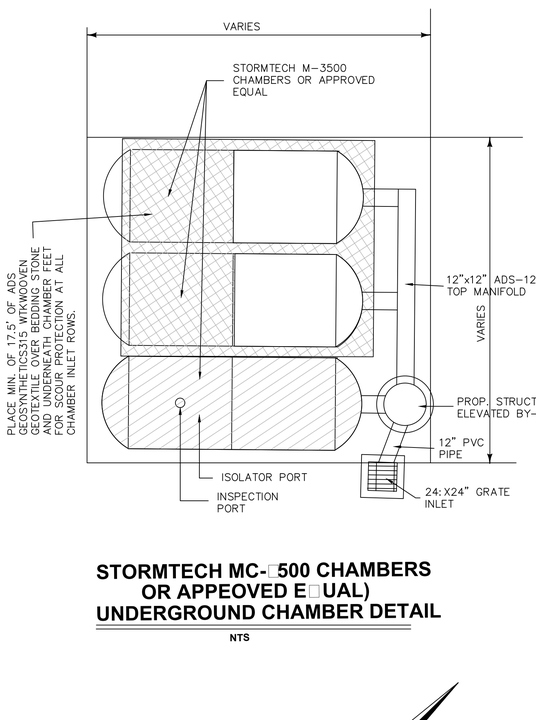
NTS

LEGE□D OR □E□ TO S□M□OLS

- PROPERTY LINE
- PROPOSED SLOPE
- 1950 — PROPOSED ELEV.
- (1940) — EXISTING ELEV.
- DRAINAGE FLOW
- DRAINAGE BOUNDARY

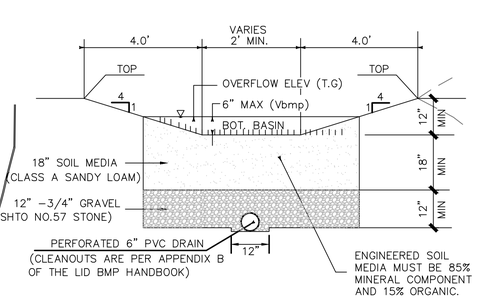
FULL TRASH CAPTURE DEVICES:
1. CURB INLET FILTER
2. FLO-GUARD GRATE INLET INSERTS





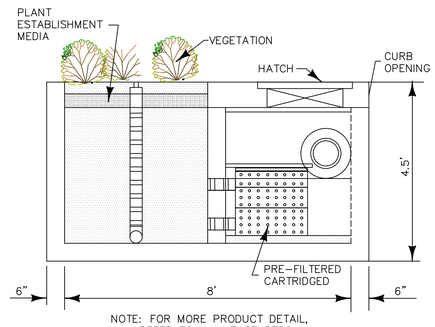
STORMTECH MC-□500 CHAMBERS OR APPEOVED E□UAL) UNDERGROUND CHAMBER DETAIL

NTS



TYPICAL BIORETENTION DETAIL

NTS



NOTE: FOR MORE PRODUCT DETAIL, REFER TO MANUFACTURERS STD, DETAILS

BIOCLEAN MODULAR WETLAND SYSTEM

NTS

T□□LE SUMM□R□□

DMA ID	AREA (S.F)	EFFECTIVE AREA (S.F)	IMPERVIOUS AREA (S.F)	PERVIOUS AREA (S.F)	VOL. BMP (CF)	VOLUME PROVIDED (CF)
A	27,456	2,746	23,037	4,419	1,080.30	1,140
B	26,397	2,640	25,339	1,058	1,267.7	1,500
C	1,457	146	0	1,457		
D	5,536	554	5,536	0	288.10	312
E	3,383	338	1,813	1,570	60.80	186
F	4,697	470	3,137	1,560	120.80	121
G	5,612	561	4,949	663	139.00	176
H	29,939	2,994	28,200	1,739	1,409.30	1,410

FLOOR AREA RATIO (FAR) = GROSS FLOOR AREA OF BUILDING / GROSS LOT AREA
= 10,831SF / 104,523SF
= 0.10 < 1.0

TOTAL PROJECT AREA = 104,523 SF (2.40 AC)
TOTAL IMPERVIOUS AREA = 92,011 SF (2.11 AC)
TOTAL PERVIOUS AREA = 12,632 SF (0.29 AC)

NOTE:

ALL GRATE INLETS MUST HAVE FLO-GUARD INLET FILTERS OR APPROVED EQUAL FOR TRASH CAPTURE.

SOURCE CO□TROL □MP□S

NON- STRUCTURAL SOURCE BMP
EDUCATION OF PROPERTY OWNERS, TENANTS, AND OCUPANYS ON STORMWATER BMP'S
SPILL CONTINGENCY PLAN
HAZARDOUS MATERIAL DISCLOSUE COMPIANCE
UNIFORM FIRE CODE IMPLEMENTATION
LITER/DEBRIS CONTROL PTOGRAM
EMPLOYEE TRAINING
VACUUM SWEEPING OF PRIVATE STREETS AND PARKIBG LOTS.
OTHER NON STRUCTURAL MEASURES FOR PUBLIC AGENCY PROJECTS.
COMPLY WITH ALL NPDES PERMITS.

STRUCTURAL SOURCE BMP
DESIGN AND CONSTRUCT TRASH AND AND WASTE STORAGE TO REDUCE POLLUTION INTRODUCTION.
USE EFFICIENT IRRIGATION SYSTEM AND LANDSCAPE DESIGN, WATER CONSERVATION.
FINISH GRADE OF LANDSCAPE AREAS IS 1" TO 2' BELOW TOP OF CURB, SIDEWALK OR PAVEMENT.
MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES
SWEEP PARKING LOTS REGILARLY TO PREVENT ACCUMULATION OF TRASH AND DEBRIS
MARK INLETS "ONLY RAIN DOWN THE STORM DRAIN".

GRAPHIC SCALE
30 0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

Underground Service Alert
Call: TOLL FREE
1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK
RIVERSIDE COUNTY FLOOD CONTROL DISTRICT BENCHMARK
DESIGNATION: Z 12924
ELEVATION: 1266.57
DESC: FOUND NAIL AND RCFC & WCD TAG FLUSH IN PAVEMENT ON LAKESHORE DRIVE .88 FEET ± EASTERLY OF K-RAILS ON LAKESHORE EASTERLY OF OUTLET

REVISIONS

SEAL: REGISTERED PROFESSIONAL ENGINEER — MOKSUDUR RAHMAN — No. C69263 — Exp. 6-30-20 — CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:
RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:
MOKSUDUR RAHMAN
R.C.E. NO. C69263 EXP. DATE :
ACCEPTED BY:
DATE:

SCALE
Horizontal
1" = 30'
Vertical
N/A

CITY OF LAKE ELSINORE

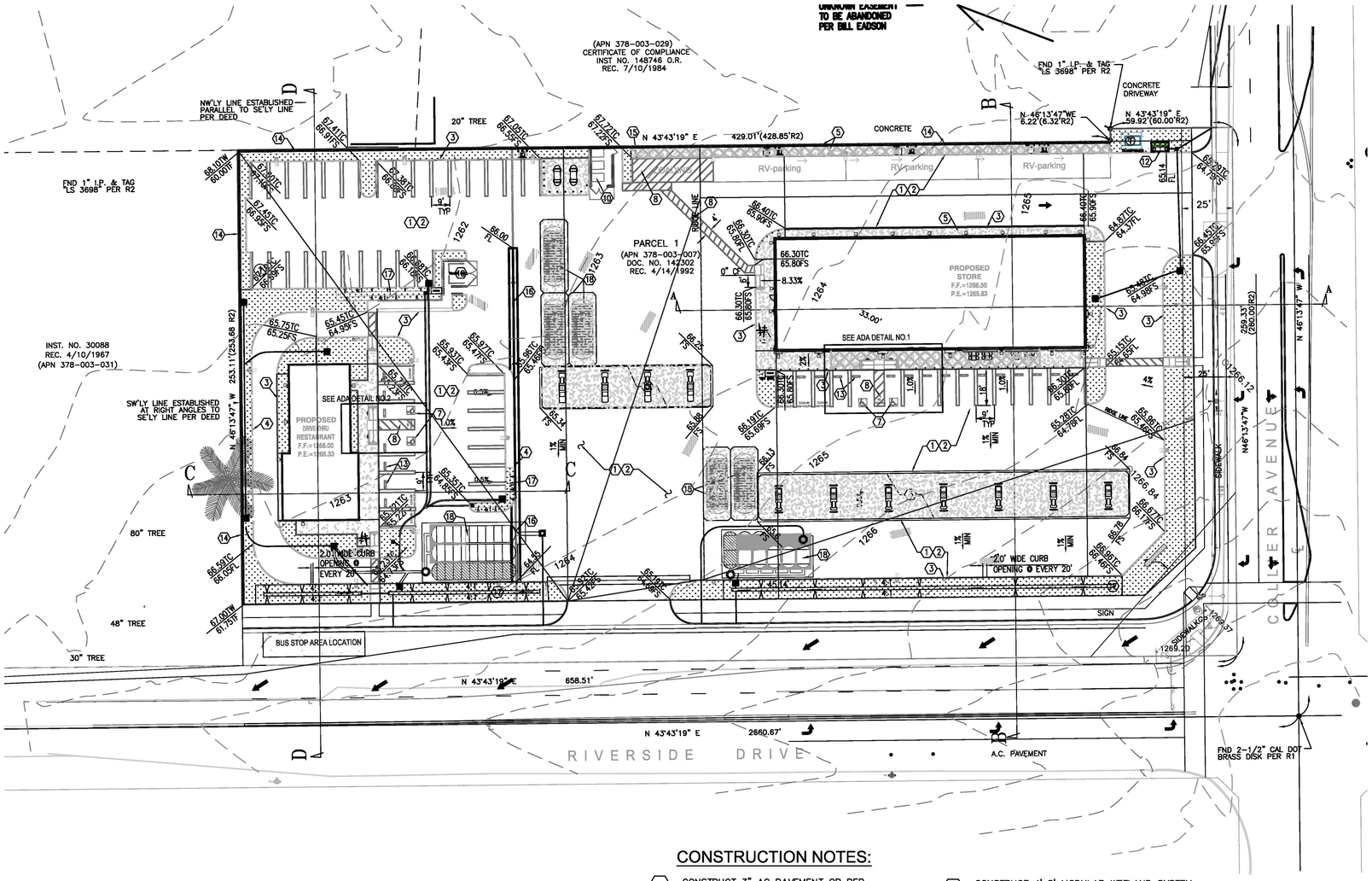
W.Q.M.P
THE KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CA 92530

1 OF 1 SHEETS

C:\Land Projects 2018\RR\2017-PROJECTS\RR\MR ENGINEERING\KASSAB TRAVEL CENTER\RR WQMP\K-WQMP SITE PLAN-V4.dwg 1-03-19 11:01:28 AM

Appendix 2: Construction Plans

Grading and Drainage Plans



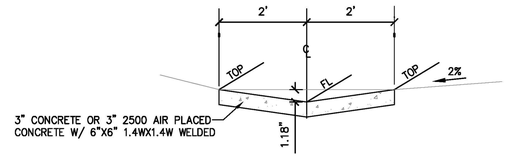
GRAPHIC SCALE

30 0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

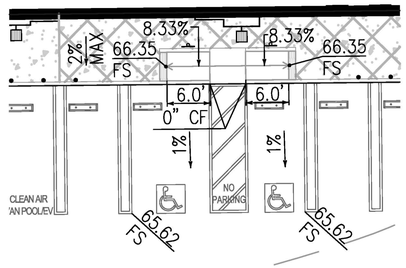
CONSTRUCTION NOTES:

1. CONSTRUCT 3" AC PAVEMENT OR PER SOILS ENGINEER RECOMMENDATIONS
2. CONSTRUCT 6" A.B OR PER SOILS ENGINEER RECOMMENDATIONS
3. CONSTRUCT TYPE 6A CURB PER CITY OF LAKE ELSINORE STD. DWG 202
4. CONSTRUCT TYPE 6 INTERGRAL CURB & GUTTER PER CITY OF LAKE ELSINORE STD. DWG 200
5. CONSTRUCT 4" CONCRETE SLAB/WALKWAY
6. PAINT 4" WHITE SOLID PARKING STRIPES
7. PAINT PAVEMENT ADA MARKING SYMBOL SIGNS
8. PAINT PAVEMENT ADA BLUE HATCH (VAN ACCESSIBLE)
9. INSTALL HANDICAPPED PARKING SIGN
10. CONSTRUCT TRASH ENCLOSURE PER ARCHITECTURAL PLANS.
11. REMOVE EXISTING TREES
12. CONSTRUCT 4'x8' MODULAR WETLAND SYSTEM (MWS-LINEAR) BY BIOCLEAN OR APPROVED EQUAL
13. CONSTRUCT 4' LONG CONCRETE WHEEL STOP
14. CONSTRUCT RETAINING WALL (UNDER SEPARATE PERMIT).
15. UNDERGROUND STORAGE TANKS (BY OYHERS)
16. CONSTRUCT RIBBON GUTTER PER DETAIL HEREON
17. CONSTRUCT BIORETENTION BASIN PER DETAIL PN SHEET 3
18. CONSTRUCT STORMTECH MC-3500 UNDERGROUND CHAMBERS OR APPROVED EQUAL PER DETAIL ON SHEET 3T 3
19. CONSTRUCT 24"x24" JENSEN GRATE INLET OR APPROVED EQUAL



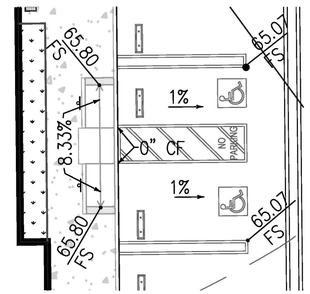
RIBBON GUTTER DETAIL

NOT TO SCALE



ADA DETAIL NO.1

SCALE: 1"=10'



ADA DETAIL NO.2

SCALE: 1"=10'

NOTE:

1. NO WORK SHALL COMMENCE WITHIN THE ROAD RIGHT OF WAY WITHOUT ISSUANCE OF ENCROACHMENT PERMIT BY TRANSPORTATION DEPARTMENT.
2. SEE STREET IMPROVEMENT PLANS FOR IMPROVEMENTS ALONG RIVERSIDE DRIVE AMD COLLIER AVENUE.

Underground Service Alert

Call: TOLL FREE 1-800 227-2600

TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK

RIVERSIDE COUNTY FLOOD CONTROL DISTRICT BENCHMARK
DESIGNATION: Z 12924
ELEVATION: 1266.57
DESC: FOUND NAIL AND RCFC & WCD TAG FLUSH IN PAVEMENT ON LAKESHORE DRIVE 88 FEET ± EASTERLY OF K-RAILS ON LAKESHORE EASTERLY OF OUTLET

REVISIONS

SEAL: REGISTERED PROFESSIONAL ENGINEER — MOKSUDUR RAHMAN — No. C69263 — Exp. 6-30-20 — CIVIL — STATE OF CALIFORNIA

PLANS PREPARED BY:

RAHMAN ENGINEERING
6939 SCHAEFER AVE, SUITE # D-170,
CHINO, CA 91710
TEL: (213) 400 - 8078

PREPARED BY:

MOKSUDUR RAHMAN
R.C.E. NO. 36117 EXP. DATE : 6-30-20

ACCEPTED BY:

DATE:

SCALE

Horizontal 1" = 40'

Vertical N/A

CITY OF LAKE ELSINORE

CONCEPTUAL GRADING PLAN THE KASSAB TRAVEL CENTER 29301 RIVERSIDE DRIVE LAKE ELSINORE, CA 92530

2 OF 3 SHEETS

C:\Land Projects 2004\PRF\2017-PROJECTS\PRF\MR ENGINEERING\KASSAB TRAVEL CENTER\PRF\GRADING\KASSAB-GP-V3.dwg 12-04-18 05:55:46 AM

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017
Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: **Infiltration/Percolation Testing for Stormwater Retention**
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

As requested, we have performed percolation/infiltration testing on the subject site in order to determine the infiltration potential of the surface soils. The percolation rates determined should be useful in assessing stormwater retention needs. It is our understanding that on-site stormwater retention will be required. It is proposed to collect the stormwater runoff within subsurface percolation chambers. This report presents the results of our study, discussion of our findings, and provides percolation rates for the subject system.

PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to determine the general percolation rates and physical characteristics of the onsite soils in order to provide design parameters for the proposed onsite infiltration system. Services provided for this study are in accordance with our agreement and consisted of the following:

- Site exploration consisting of the excavation and logging of three test holes;
- Percolation testing in the test holes (P-1, P-2 and P-3);
- Compilation of this report, which presents the results of our study and provides percolation rates for the design of an onsite infiltration system.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The subject property is presently occupied by a vacant land. The project consists of construction of Gas Station, RV Fueling Station and associated improvements. Further information regarding proposed development and test hole locations is shown on Figure 1, Percolation Test Holes Location Map.

FIELD INVESTIGATION

Our field investigation consisted of excavating three shallow exploratory test holes, which were also used as percolation test holes. Hollow-stem drilled equipment was utilized to excavate the exploratory test holes. An engineer logged and observed the test holes excavations. Soil classification was based on visual observation. The approximate locations of the exploratory and

percolation test holes are shown on Figure 1 (Percolation Test Holes Location Map). Logs of the exploratory test holes are presented in Appendix A.

SUBSURFACE SOILS CONDITIONS

SOIL PROFILE

The soils encountered within our test holes consisted of native soil materials. Native soils encountered within the exploratory test holes consisted primarily of sandy clay and clay. A more detailed description of these materials is provided in the exploratory test holes logs included in the enclosed Appendix A. Soils encountered were classified according to the Unified Soil Classification System (USCS).

GROUNDWATER

Groundwater was not encountered within the exploratory test holes to the maximum explored depth of 5 feet below ground surface (bgs). Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

PERCOLATION TESTING AND PROCEDURE

Percolation testing was performed to assess the general percolation rates of the onsite soils for the design of an onsite infiltration system.

The continuous pre-soak (falling-head) test procedure was utilized for testing. Water was allowed to presoak in each test hole prior to obtaining test readings. Following the presoak period, the drop in water level in each hole was monitored every 10 to 30 minutes to determine the appropriate method for testing. Test holes were refilled following each reading or when the water depth was below 6 inches. Test times ranged from 120 to 150 minutes. The drop in water level was recorded to the nearest $1/10^{th}$ inch to produce conservative water level readings.

SUMMARY OF INFILTRATION TEST RESULTS

Tests results are summarized below:

Test Hole No.	Rate (Inch/Hour)
1	1.3
2	1.4
3	1.2

Based on the obtained field data, 1.2 inches per hour should be utilized in the design of the proposed onsite drain system. The base of the system should be founded into natural soils.

It should be noted that the infiltration rates determined are ultimate rates based upon field test results. An appropriate safety factor should be applied to account for subsoil inconsistencies and potential silting of the percolating soils. The safety factor should be determined with consideration to other factors in the stormwater retention system design (particularly stormwater volume estimates) and the safety factors associated with those design components.

The Storm water Manager's Resource Center (SMRC) web site (http://www.stormwatercenter.net/) includes guidelines for disposal of storm water with respect to setback of structures. It is included in the criteria that infiltration facilities should be setback 10 feet down-gradient from structures. In order to avoid potential adversely impacting any existing structures, we recommend that any infiltration system be kept a horizontal distance of at least 10 feet from the edge of new building and the property line.

LIMITATIONS

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering and engineering geologic principals and practice within our opinion at this time in Southern California. Our conclusions and recommendations are based on the results of the field investigations, combined with an interpolation of subsurface conditions between and beyond exploration locations.

As the project evolves, our continued consultation and construction monitoring should be considered. GeoBoden should review plans and specifications to ensure the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this study are valid. Where significant design changes occur, GeoBoden may be required to augment or modify these recommendations. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and/or modified recommendations. This report was written for Client, and the design team members, and only for the proposed development described herein. We are not responsible for technical interpretations made by others, or exploratory information that has not been described or documented in this report. Specific questions or interpretations concerning our findings and conclusions may require written clarification.

We appreciate the opportunity to provide service to you on this project. If you have questions regarding this letter or the data included, please contact the undersigned.

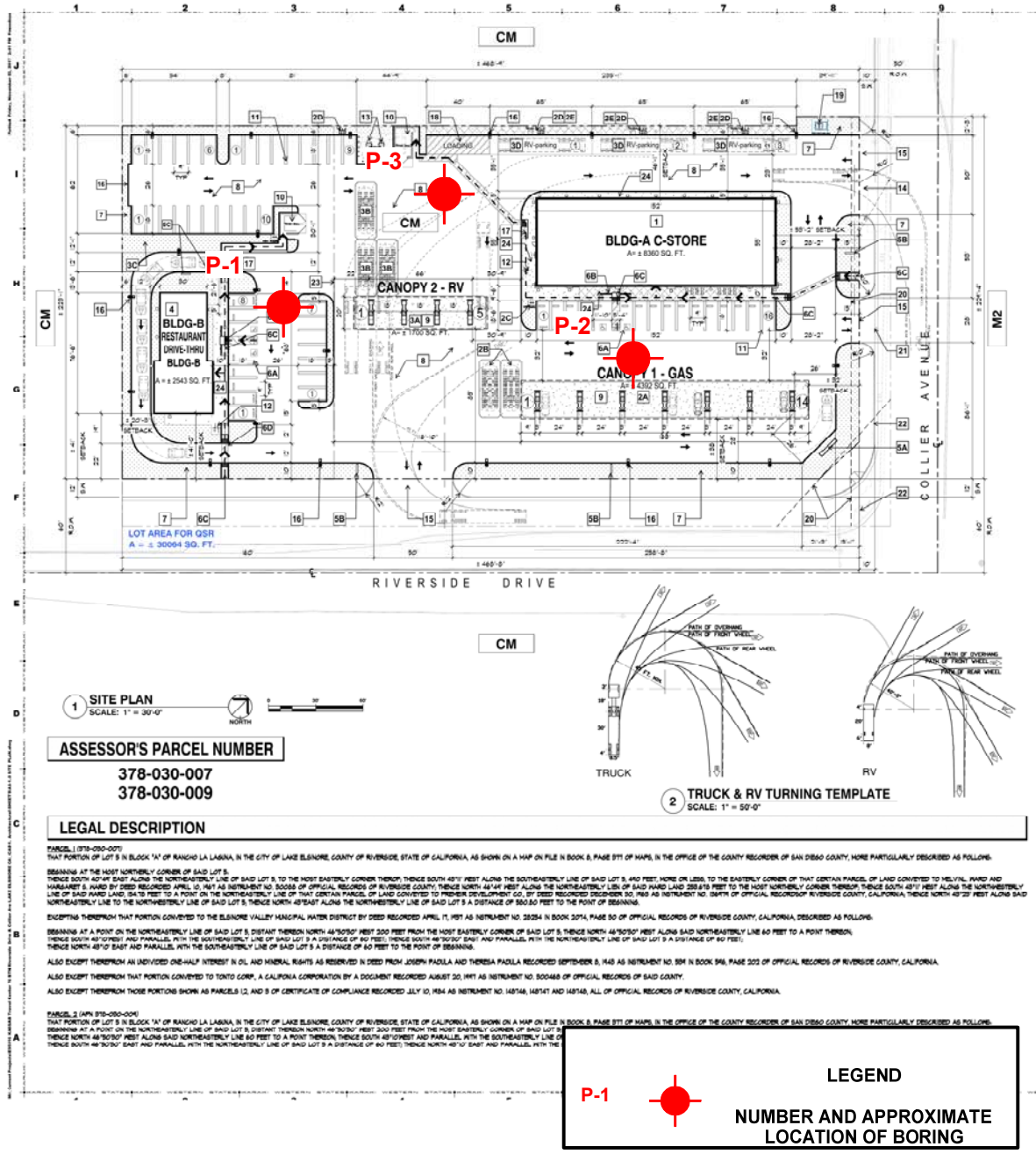
Sincerely,
GEOBODEN, INC.

Cyrus Radvar
Principal Engineer, G.E. 2742

Copies: 3/Addressee

Attachments:

Figure 1 – Percolation Test Holes Location Map
Appendix A – Test Holes Logs



ASSESSOR'S PARCEL NUMBER

378-030-007
378-030-009

LEGAL DESCRIPTION

PARCEL 1 (378-030-007)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 5;
THENCE SOUTH 40°49' EAST ALONG THE NORTHEASTERLY LINE OF SAID LOT 5, TO THE MOST EASTERLY CORNER THEREOF; THENCE SOUTH 49°11' WEST ALONG THE SOUTHEASTERLY LINE OF SAID LOT 5, 440 FEET, MORE OR LESS, TO THE EASTERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO MELVIN L. WARD AND MARGARET S. WARD BY DEED RECORDED APRIL 10, 1961 AS INSTRUMENT NO. 30058 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY; THENCE NORTH 40°49' WEST ALONG THE NORTHEASTERLY LINE OF SAID WARD LAND, 284.78 FEET TO A POINT ON THE NORTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND CONVEYED TO PIONEER DEVELOPMENT CO., BY DEED RECORDED DECEMBER 30, 1960 AS INSTRUMENT NO. 138479 OF OFFICIAL RECORDSOF RIVERSIDE COUNTY, CALIFORNIA; THENCE NORTH 49°23' WEST ALONG SAID NORTHEASTERLY LINE TO THE NORTHWESTERLY LINE OF SAID LOT 5; THENCE NORTH 49°EAST ALONG THE NORTHWESTERLY LINE OF SAID LOT 5 A DISTANCE OF 550.50 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT BY DEED RECORDED APRIL 17, 1957 AS INSTRUMENT NO. 28254 IN BOOK 3074, PAGE 50 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5; THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON;
THENCE SOUTH 40°10'10" WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET;
THENCE NORTH 40°10' EAST AND PARALLEL WITH THE SOUTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF INTEREST IN OIL AND MINERAL RIGHTS AS RESERVED IN DEED FROM JOSEPH PADILLA AND THERESA PADILLA RECORDED SEPTEMBER 8, 1948 AS INSTRUMENT NO. 594 IN BOOK 596, PAGE 202 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO TONTO CORP., A CALIFONIA CORPORATION BY A DOCUMENT RECORDED AUGUST 20, 1991 AS INSTRUMENT NO. 300468 OF OFFICIAL RECORDS OF SAID COUNTY.

ALSO EXCEPT THEREFROM THOSE PORTIONS SHOWN AS PARCELS 12, AND 9 OF CERTIFICATE OF COMPLIANCE RECORDED JULY 10, 1984 AS INSTRUMENT NO. 148746, 148747 AND 148748, ALL OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (APN 378-030-004)
THAT PORTION OF LOT 5 IN BLOCK "A" OF RANCHO LA LAGUNA, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN ON A MAP ON FILE IN BOOK 8, PAGE 571 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF SAID LOT 5, DISTANT THEREON NORTH 40°50'50" WEST 300 FEET FROM THE MOST EASTERLY CORNER OF SAID LOT 5;
THENCE NORTH 49°50'50" WEST ALONG SAID NORTHEASTERLY LINE 60 FEET TO A POINT THEREON; THENCE SOUTH 40°10' WEST AND PARALLEL WITH THE SOUTHEASTERLY LINE
THENCE SOUTH 49°50'50" EAST AND PARALLEL WITH THE NORTHEASTERLY LINE OF SAID LOT 5 A DISTANCE OF 60 FEET; THENCE NORTH 40°10' EAST AND PARALLEL WITH THE

P-1 — **LEGEND**

NUMBER AND APPROXIMATE LOCATION OF BORING

LEGEND

- NO. OF PARKING SPACES
- ACCESSIBLE PARKING
- PROPERTY LINE (BEFORE R.O.W. DEDICATION)
- PROPERTY LINE (AFTER R.O.W. DEDICATION)
- HANDICAP PATH OF TRAVEL
- CONCRETE PAVING AREA
- LANDSCAPED AREA
- DECORATIVE STAMPED CONCRETE
- WALL MOUNTED AREA LIGHTS
- DIRECTIONAL ARROW
- AREA LIGHTS
- (E) FIRE HYDRANT

SITE KEY NOTES

1 CONVENIENCE STORE
2A GAS STATION CANOPY AND FUEL DISPENSERS FOR AUTOS
2B UNDERGROUND STORAGE TANK
2C VENT RISER WITH CARBON CANISTER
2D AIR & WATER UNIT
2E TRASH BIN
3A GAS STATION CANOPY AND FUEL DISPENSERS OR R.V. & TRUCKS
3B UNDERGROUND STORAGE TANK
3C VENT RISER WITH CARBON CANISTER
3D RV PARKING W/ DUMP STATION
4 FASTFOOD WITH DRIVE-THRU
5A MONUMENT SIGN (UNDER SEPARATE PERMIT)
5B PRICE SIGN (UNDER SEPARATE PERMIT)
5C DRIVE THRU MENU BOARD SIGN
6A ACCESSIBLE PARKING (WITH WHEELCHAIR WHERE REQUIRED)
6B ACCESSIBLE PARKING SIGN
6C ADA ACCESSIBLE RAMP & TRUNCATED DOME PAVER
6D ADA ACCESSIBLE PATH STRIPING (2% MAX CROSS SLOPE)
7 LANDSCAPE WITH 6" CONCRETE CURB
8 ASPHALT PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
9 CONCRETE PAVING - ALL WEATHER SURFACE TO SUPPORT 75,000 LBS PER FIRE DEPT REQUIREMENTS
10 TRASH ENCLOSURE (PER CITY STANDARD WHERE APPLICABLE)
11 PARKING STRIPING AS PER CITY STANDARDS (WITH WHEELCHAIR WHERE REQUIRED)
12 BIKE PARKING RACK
13 PROPANE TANK
14 (E) DRIVEWAY TO REMOVE, CONSTRUCT (N) SIDEWALK PER CITY STANDARDS
15 (N) DRIVEWAY PER CITY STANDARDS NO. 108A
16 AREA LIGHTS
17 SERVICE RAMP
18 SERVICE LOADING AREA
19 PROPOSED LOCATION OF TRANSFORMER
20 (E) WATER & TELEPHONE EASEMENT
21 (E) POWER POLE (TO BE RELOCATED PER CITY R.O.W. WIDENING)
22 (E) CURB, GUTTER & SIDEWALK (TO BE RELOCATED PER CITY R.O.W. WIDENING)
23 PROPOSED NEW PARCEL LINE FOR QSR WITH DRIVE-THRU
24 CONCRETE WALKWAY

VICINITY MAP

PROJECT DATA

ZONING	C-M (COMMERCIAL MANUFACTURING)	
LAND USE	COMMERCIAL	
AREA OF SITE	± 124,045 S.F. (± 2.85 ACRES) (BEFORE R.O.W. DEDICATION) ± 104,824 S.F. (± 2.34 ACRES) (AFTER R.O.W. DEDICATION)	
BLDG SETBACKS	REQUIRED	PROPOSED
FRONT	20'-0"	20'-0" / 41'-0"
REAR	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	46'-1"
SIDE (YARD)	0'-0" (5'-0" IF ADJACENT TO R-ZONE)	20'-9"
SIDE (STREET)	15'-0"	52'-0" / 51'-0"
LANDSCAPE AREA	12%	16.45% (± 17,140 S.F.)
FLOOR AREA RATIO	-	0.152
LOT COVERAGE	-	18.2%
MAXIMUM HEIGHT	45'-0"	± 26'-0"
PARKING (SEE PARKING COMPUTATION BELOW)	64	75

BUILDING DATA

(N) BLDG-A CONVENIENCE STORE

AREA	± 8,360 SF
OCCUPANCY	M
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 26'-0"
FIRE SPRINKLER	YES

(N) BLDG CANOPY (FOR AUTOS)

AREA	± 4,312 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 18'-0"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG CANOPY (FOR R.V.s)

AREA	± 1,700 SF
OCCUPANCY	M
TYPE OF CONST	II-B
NUMBER OF STORY	1
BLDG HEIGHT	± 14'-8"
(CANOPY CLEARANCE)	± 13'-0"
FIRE SPRINKLER	NONE

(N) BLDG-B FASTFOOD REATAURANT W/ DRIVE-THRU

AREA	± 2,543 SF
OCCUPANCY	A-2
TYPE OF CONST	V-B
NUMBER OF STORY	1
BLDG HEIGHT	± 22'-2"
FIRE SPRINKLER	NONE

PARKING ANALYSIS

PARKING STANDARDS

TYPE	SIZE
REGULAR	9'-0" X 18'-0"
PARALLEL	8'-0" X 23'-0"
HANDICAP	11'-0" X 18'-0" VAN ACCESSIBLE
LOADING	12'-0" X 40'-0" (TYPE-B)

PARKING REQUIREMENTS

USE	REQUIRED	PROPOSED
C-STORE (RETAIL AREA) (± 8,760 SF)	17	14 (4 CANOPIES)
FORMULA: 1 SP PER 400 SF (CM-DISTRICT)		
C-STORE (QSR AREA) (± 1,800 SF)	21	25
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		
FASTFOOD RESTAURANT	31	31
FORMULA: 1 SP PER 45 SF OF CUSTOMER AREA, PLUS 1 SP PER 200 SF OF NON-CUSTOMER AREA		

HANDICAP PARKING REQUIREMENTS

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (3)		(4)

CLEAN AIR VEHICLE PARKING

FORMULA	REQUIRED	PROPOSED
51-75 PARKING SPACES (6)		(6)

TOTAL PARKING SPACES	64	75

KARAKI WSe
WESTERN STATES ENGINEERING
A DESIGN-BUILD COMPANY
4667 E. LA PALMA STE. 707
TEL: (714)693-9300 FAX: (714)693-1002
CONSULTANT/ SEALS

SUBMITTAL
NO. DESCRIPTION BY DATE
1
2
3
4

REVISIONS
NO. DESCRIPTION BY DATE
△
△
△
△

OWNER NAME & ADDRESS
MR. RON KASSAB

PROJECT NAME & ADDRESS
THE KASSAB TRAVEL CENTER
Gas Station, RV Fueling Station
QSR w/ Drive-Thru
29301 RIVERSIDE DRIVE
LAKE ELSINORE CA 92530

NOTE TO CONTRACTOR

CONFIDENTIALITY STATEMENT

DESIGNED BY: WS
DRAWN BY: WS
CHECKED BY: JK
DATE DRAWN: 11.03.17
SCALE: 1" = 30'-0"
SHEET TITLE
SITE PLAN

BLDG SHEET NUMBER
AS-1.0
JOB No E95010
CUP No. CUP NO.

GEOBODEN INC. Geotechnical Consultants	PERCOLATION BORING LOCATION PLAN Proposed Kassab Travel Center 29301 Riverside Drive Lake Elsinore, California	Figure By S.R. Map No. XX Date 12-30-17 Project No. Lake Elsinore Figure No. 2

GEOBODEN, INC.

BORING NUMBER P-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER P-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER P-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		SANDY CLAY (CL): strong brown, moist, fine sand										
2.5												
5.0		Bottom of borehole at 5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 5.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 12:06 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\PERCOLATION\LOGS.GPJ

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE

Lake Elsinore, California

Prepared for:
MR. RON KASSAB

Prepared by:
GEOBODEN INC.
Irvine, CA 92620

December 30, 2017

Project No. Lake Elsinore-1-01

GEOBODEN INC.

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

MR. RON KASSAB

Prepared by:

GEOBODEN INC.
5 Hodgenville, Suite A.
Irvine, California 92620

December 30, 2017

JOB NO. Lake Elsinore-1-01

GEOBODEN, INC.
Geotechnical Consultants

December 30, 2017 Project No. Lake Elsinore-1-01

Attention: Mr. Ron Kassab

Subject: Geotechnical Investigation Report
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

GeoBoden, Inc. (GeoBoden) is pleased to submit herewith our geotechnical investigation report for the Proposed Kassab Travel Center to be constructed at 29301 Riverside Drive in the city of Lake Elsinore, California.

This report presents the results of our field investigation, laboratory testing and our engineering judgment, opinions, conclusions and recommendations pertaining to geotechnical design aspects of the proposed development.

It has been a pleasure to be of service to you on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please do not hesitate to contact us.

Respectfully submitted,
GEOBODEN, INC.

Cyrus Radvar,
Principal Engineer, G.E. 2742

Copies: 4/Addressee

GEOTECHNICAL INVESTIGATION REPORT

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

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GEOTECHNICAL INVESTIGATION REPORT
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
Lake Elsinore, California

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by GeoBoden, Inc. (GeoBoden) for the Proposed Kassab Travel Center to be located at 29301 Riverside Drive in Lake Elsinore, California. The general location of the project is shown on Figure 1.

The purposes of this investigation were to determine the geotechnical properties of subsurface soil conditions, to evaluate their in-place characteristics, evaluate site seismicity, and to provide geotechnical recommendations with respect to site grading and for design and construction of proposed foundations and other site improvements.

The scope of the authorized investigation included performing a site reconnaissance, conducting field exploration and laboratory testing programs, performing engineering analyses, and preparing this Geotechnical Investigation Report. Evaluation of environmental issues or the potential presence of hazardous materials was not within the scope of services provided.

This report has been prepared for RON KASSAB and their other project team members, to be used solely in the development of facilities described herein. This report may not contain sufficient information for other uses or the purposes of other parties.

2.0 SITE LOCATION AND PROJECT DESCRIPTION

The site is located at 29301 Riverside Drive in Lake Elsinore, California. The site is bounded by Collier Avenue on the east, by an existing building on the north, by a vacant land on the west, and by Riverside Drive on the south. The subject property is presently occupied by a vacant land.

The maximum column load for the new building will be about 75 kips, and the line load will be about 3 kips per lineal feet. Currently, it is our understanding that the proposed building will consist of masonry construction with slab on-grade.

3.0 GEOTECHNICAL INVESTIGATION

Our geotechnical investigation included a field exploration program and a laboratory testing programs. These programs were performed in accordance with our scope of services. The field exploration and laboratory testing programs are briefly described below. A more detailed description of the field exploration and laboratory testing programs is provided in Appendix A and Appendix B, respectively.

3.1 FIELD EXPLORATION PROGRAM

The field exploration program was initiated on December 18, 2017 under the supervision of an engineer. Eight (8) exploratory borings were drilled using a truck-mounted drilling rig equipped with 8-inch diameter hollow stem augers. The borings were advanced to depths of ranging from 11.5 to 31.5 feet (below ground surface). The approximate locations of exploratory borings are shown on Figure 2.

Logs of subsurface conditions encountered in the borings were prepared in the field by a representative of our firm. Soil samples consisting of relatively undisturbed brass ring samples and Standard Penetration Tests (SPT) samples were collected at approximately 5-foot depth intervals and were returned to the laboratory for testing. The SPTs were performed in accordance with ASTM D 1586. Final boring logs were prepared from the field logs and are presented in Appendix A.

3.2 LABORATORY TESTING

Selected samples collected during drilling activities were tested in the laboratory to assist in evaluating controlling engineering properties of subsurface materials at the site. Physical tests performed included moisture and density determination, consolidation, expansion index, No. 200 Sieve, Atterberg limits, and corrosion. The results of laboratory are presented in Appendix B.

4.0 DISCUSSION OF FINDINGS

The following discussion of findings for the site is based on the results of the field exploration and laboratory testing programs.

4.1 SITE AND SUBSURFACE CONDITIONS

Observed subsurface native soils consisted of sandy clay, clay, clay with sand, sand and sand with silt to the maximum explored depth of 31.5 feet below ground surface (bgs).

Based on blow counts recorded during sampling, the clayey soils encountered within borings were found to be firm to stiff. The sandy soil was found to be medium dense. For a more detailed description of the subsurface materials refer to the boring logs included in Appendix A of this report.

4.2 GROUNDWATER CONDITIONS

Groundwater was encountered within our exploratory boring B-1 through B-5 at 15 feet bgs. Based on information from the nearby wells (http://www.water.ca.gov/waterdatalibrary/), the historic high ground water level in the site vicinity is at a depth of greater than 50 feet beneath the existing ground surface.

Fluctuations of the groundwater table, localized zones of perched water, and rise in soil moisture content should be anticipated during the rainy season. Irrigation of landscaped areas can also lead to an increase in soil moisture content and fluctuations of intermittent shallow perched groundwater levels.

4.3 SOIL ENGINEERING PROPERTIES

Physical tests were performed on the relatively undisturbed samples to characterize the engineering properties of the native soils. Moisture content determination was performed on the samples to evaluate the in-situ moisture content. Moisture content and dry unit weight results are included in Appendix B.

4.4 CONSOLIDATION CHARACTERISTICS

Consolidation tests were performed on samples of the existing fill and native overburden soils recovered from the boring. Results of the consolidation tests indicate that the overburden material will have moderate compressibility under the anticipated loads. These characteristics are compatible with the allowable bearing capacity values and corresponding settlement estimates presented in Foundations Section of our report.

4.5 COLLAPSE POTENTIALS

Results of consolidation tests on samples of native soil indicate that the native soils will have low collapse potential. Removal and recompaction of the surficial soils is expected to reduce the anticipated amount of total differential settlement within the site.

4.6 EXPANSIVE SOILS

Preliminary laboratory testing of representative sample of onsite soils indicate that these materials exhibit LOW expansion potential. We anticipate that the design and performance of the proposed new building will not be affected by expansion of onsite soils.

5.0 STRONG GROUND MOTION POTENTIAL

The project site is located in a seismically active area typical of Southern California and likely to be subjected to a strong ground shaking due to earthquakes on nearby faults.

The Elsinore (Glen Ivy) rev fault is the closest known active fault, located 1.91-km of the site with an anticipated maximum moment magnitude (M_w) of 7.7.

5.1 CBC DESIGN PARAMETERS

To accommodate effects of ground shaking produced by regional seismic events, seismic design can, at the discretion of the designing Structural Engineer, be performed in accordance with the 2016 edition of the California Building Code (CBC). Table below, 2016 CBC Seismic Parameters, lists (next) seismic design parameters based on the 2016 CBC methodology, which is based on ASCE/SEI 7-10:

2016 CBC Seismic Design Parameters	Value
Site Latitude (decimal degrees)	33.6947
Site Longitude (decimal degrees)	-117.3471
Site Class Definition (ASCE 7 Table 20.3-1)	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Figure 1613.3.1(1))	2.293
Mapped Spectral Response Acceleration at 1s Period, S_1 (Figure 1613.3.1(2))	0.915
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613.3.3(1))	1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613.3.3(2))	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16-37)	2.293
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16-38)	1.372
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16-39)	1.528
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16-40)	0.915

6.0 LIQUEFACTION POTENTIAL

For liquefaction to occur, all of three key ingredients are required: liquefaction-susceptible soils, groundwater within a depth of 50 feet or less, and strong earthquake shaking. Soils susceptible to liquefaction are generally saturated loose to medium dense sands and non-plastic silt deposits below the water table.

Groundwater was encountered within our borings B-1 through B-5 at 15 feet. Historic high groundwater at the site is as deep as 50 feet. Soil materials encountered within our borings are clayey soil. It is our opinion that potential for liquefaction at the site is low.

7.0 DESIGN RECOMMENDATIONS

Based upon the results of our investigation, the proposed development is considered geotechnically feasible provided the recommendations presented herein are incorporated into the design and construction. If changes in the design of the structure are made or variations or changed conditions are encountered during construction, GeoBoden should be contacted to evaluate their effects on these recommendations. The following geotechnical engineering recommendations for the proposed buildings are based on observations from the field investigation program and the physical test results.

7.1 EARTHWORK

All earthworks, including excavation, backfill and preparation of subgrade, should be performed in accordance with the geotechnical recommendations presented in this report and applicable portions of the grading code of local regulatory agencies. All earthwork should be performed under the observation and testing of a qualified geotechnical engineer.

7.2 SITE AND FOUNDATION PREPARATION

All site preparation should be observed by experienced personnel reporting to the project Geotechnical Engineer. Our field monitoring services are an essential continuation of our prior studies to confirm and correlate the findings and our prior recommendations with the actual subsurface conditions exposed during construction, and to confirm that suitable fill soils are placed and properly compacted.

Clearing operations should include the removal of all surface vegetation. Large shrubs, when removed, should be grubbed out to include their stumps and major root systems.

In general, all fill soils within the proposed building footprints should be overexcavated and replaced with engineered fill. As a minimum, removals should extend to competent native soils. At least 3 feet of compacted fill should be provided underneath all spread footings and floor slabs. The compacted fill should extend laterally a minimum of 5 feet beyond the foundation footprints, where possible. All existing low-density, near-surface soils will require removal to competent material from areas to receive newly compacted fill. The basis for establishing a competent exposed surface on which to place fill should consist of competent materials exhibiting an in-place relative compaction of at least 85 percent. Prior to placing structural fill, exposed bottom surfaces in each removal area approved for fill should first be scarified to a depth of at least 6 inches, water or air dried as necessary to achieve 3 percent above optimum moisture conditions, and then recompacted in place to a minimum relative compaction of 90 percent.

Based on the observations made in our borings and the results of pertinent laboratory tests, anticipated depths of removal of unsuitable soils will range from 4 to 5 feet. However, actual removal depths will have to be determined during grading on the basis of in-grading observations and testing performed by a representative of geotechnical consultants.

To provide support for foundations for minor structures and for at-grade concrete walks and slabs, all existing fill and disturbed natural soils should be excavated and replaced with properly compacted fill. Any required fill should be properly compacted as specified below.

At least the upper six (6) inches of all excavated surfaces should be scarified and moisture conditioned to 3 percent above optimum moisture, if necessary, and compacted to at least 90 percent relative compaction as per ASTM Standard D1557 test method, prior to placing any fill and/or structures.

7.3 FILL PLACEMENT AND COMPACTION REQUIREMENTS

Material for engineered fill should be select free of organic material, debris, and other deleterious substances, and should not contain fragments greater than 3 inches in maximum dimension. On-site excavated soils that meet these requirements may be used to backfill the excavated building pad area.

All fill should be placed in 6-inch-thick maximum lifts, watered or air dried as necessary to 3 percent above optimum moisture content, and then compacted in place to a maximum relative compaction of 90 percent. The laboratory maximum dry density and optimum moisture content for each change in soil type should be determined in accordance with Test Method ASTM D 1557. A representative of the project consultant should be present on-site during grading operations to verify proper placement and compaction of all fill, as well as to verify compliance with the other geotechnical recommendations presented herein.

Imported soils, if any, should consist of clean materials exhibiting a VERY LOW expansion potential (Expansion Index less than 20). Soils to be imported should be approved by the project geotechnical consultant prior to importation.

7.4 GEOTECHNICAL OBSERVATIONS

Exposed bottom surfaces in each removal area should be observed and approved by the project geotechnical consultant prior to placing fill. No fill should be placed without prior approval from the geotechnical consultant.

The project geotechnical consultant should be present on site during grading operations to verify proper placement and compaction of fill, as well as to verify compliance with the recommendations presented herein.

7.5 UTILITY TRENCH BACKFIL

All utility trench backfill should be compacted to a minimum relative compaction of 90 percent. Trench backfill materials should be placed in lifts no greater than approximately 6 inches in thickness, watered or air-dried as necessary to 3 percent above optimum moisture content, and then mechanically compacted in place to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should probe and test the backfills to verify adequate compaction.

As an alternative for shallow trenches where pipe or utility lines may be damaged by mechanical compaction equipment, such as under floor slabs, imported clean sand exhibiting a sand equivalent (SE) value of 30 or greater may be utilized. The sand backfill materials should be watered to achieve 3 percent above optimum moisture conditions and then tamped into place. No specific relative compaction will be required; however, observation, probing, and if deemed necessary, testing should be performed by a representative of the project geotechnical consultant to verify an adequate degree of compaction and that the backfill will not be subject to settlement.

Where utility trenches enter the footprint of the floor slabs, they should be backfilled through their entire depths with on-site fill materials, sand-cement slurry, or concrete rather than with any sand or gravel shading. This "Plug" of less- or non-permeable materials will mitigate the potential for water to migrate through the backfilled trenches from outside to the areas beneath the foundations and floor slabs.

7.6 SHALLOW FOUNDATIONS

Following the site and foundation preparation recommended above, foundation for load bearing walls and interior columns may be designed as discussed below.

7.6.1 Bearing Capacity and Settlement

Load bearing walls and interior columns may be supported on continuous spread footings and isolated spread footings, respectively, and should bear entirely upon undisturbed native or properly engineered fill. Continuous and isolated footings should have a minimum width of 18 inches and 24 inches, respectively. All footings should be embedded a minimum depth of 24 inches measured from the lowest adjacent finish grade. Continuous and isolated footings placed on such materials may be designed using an allowable (net) bearing capacity of 1,800 pounds per square foot (psf) respectively. Allowable increases of 200 psf for each additional 1 foot in width and 200 psf for each additional 6 inches in depth may be utilized, if desired. The maximum allowable bearing pressure should be 2,500 psf. The maximum bearing value applies to combined dead and sustained live loads. The allowable bearing pressure may be increased by one-third when considering transient live loads, including seismic and wind forces.

Based on the allowable bearing value recommended above, total settlement of the shallow footings are anticipated to be less than one inch, provided foundation preparations conform to the recommendations described in this report. Differential settlement is anticipated to be approximately half the total settlement for similarly loaded footings spaced up to approximately 30 feet apart.

7.6.2 Lateral Load Resistance

Lateral load resistance for the spread footings will be developed by passive soil pressure against sides of footings below grade and by friction acting at the base of the concrete footings bearing on compacted fill. An allowable passive pressure of 200 psf per foot of depth may be used for design purposes. An allowable coefficient of friction 0.30 may be used for dead and sustained live load forces to compute the frictional resistance of the footings constructed directly on compacted fill. Safety factors of 2.0 and 1.5 have been incorporated in development of allowable passive and frictional resistance values, respectively. Under seismic and wind loading conditions, the passive pressure and frictional resistance may be increased by one-third.

7.6.3 Footing Reinforcement

Reinforcement for footings should be designed by the structural engineer based on the anticipated loading conditions. Footings for structures that are supported in low expansive soils should have No. 4 bars, two top and two bottom.

7.7 CONCRETE SLAB ON-GRADE

Concrete slabs will be placed on undisturbed natural soils or properly compacted fill as outlined in Section 7.2. Moisture content of subgrade soils should be maintained 3 percent above the optimum moisture content.

At the time of the concrete pour, subgrade soils should be firm and relatively unyielding. Any disturbed soils should be excavated and then replaced and compacted to a minimum of 90 percent relative compaction. Slabs should be designed to accommodate low expansive fill soils. The structural engineer should determine the minimum slab thickness and reinforcing depending upon the expansive soil condition intended use. Slabs placed on low expansive soils should be at least 4 inches thick and have minimum reinforcement of No. 3 bars placed at mid-height of the slabs and spaced 18 inches on centers, in both directions. The structural engineer may require thicker slabs with more reinforcement depending on the anticipated slab loading conditions.

If moisture-sensitive floor covering is planned, a layer of open-graded gravel, at least 4 inches thick, should be placed below the concrete slab to form a capillary break. Alternately, moisture-proof membrane (such as 10-mil) may be utilized. The vapor barrier should be placed between sand layers (2 inches above and below) to protect the membrane from damage during construction. Gravel for use under a concrete floor slab should be clean, crushed rock that meets the gradation requirements presented below.

Sieve Size	Percentage
1 inch	100
¾ inch	90-100

No. 4 0-10

7.8 PRELIMINARY PAVEMENT DESIGN

Pavement design should be confirmed at the completion of site grading when the subgrade soils are in-place. This should include sampling and R-Value testing of the actual subgrade soils and an analysis based upon the anticipated traffic loading.

For a preliminary pavement design, recommendations for pavement design section of asphalt parking areas are provided below. These values are based on an assumed R-value of 25.

For pavement design, Traffic indexes (TI) of 4.0 and 5.5 were used for the parking areas and auto driveways, respectively. The preliminary flexible pavement layer thickness is as follows:

RECOMMMENDED ASPHALT PAVEMENT SECTION LAYER THICKNESS

Pavement Material	Recommended Thickness	
	TI = 4.0	TI = 5.5
Asphalt Concrete Surface Course	3 inches	4 inches
Class II Aggregate Base Course	6 inches	8 inches
Compacted Subgrade Soils	12 inches	12 inches

Asphalt concrete should conform to Sections 203 and 302 of the latest edition of the Standard Specifications for Public Works Construction ("Greenbook").

Class II aggregate base should conform to Section 26 of the Caltrans Standard Specifications, latest edition. The aggregate base course should be compacted to at least 95 percent of the maximum dry density as determined by ASTM Method D 1557.

Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for three Traffic Indices are presented below. We have assumed that the portland cement concrete will have a compressive strength of at least 3,000 pounds per square inch.

Assumed Traffic Index	PCC Paving (Inches)	Base Course (Inches)
4½ (Automobile Parking)	7	4
5½ (Driveways and Light Track Traffic)	7½	4
6½ (Roadways and Heavy Truck Traffic)	8	4

7.9 SOLUBLE SULFATES AND SOIL CORROSIVITY

Concrete subject to exposure to sulfates shall comply with the requirements set forth in ACI 318, Section 4.3. Based on the available water soluble sulfate results the corrosion potential to buried concrete should be considered "low", i.e., exposure Class S_0, per ACI 318, Table 4.2.1. Consequently, injurious sulfate attack is not a concern with a minimum 28-day compressive strength of 2,500 psi.

Per CBC 2016, Section 1904.4, concrete reinforcement should be protected from corrosion and exposure to chlorides in accordance with ACI 318, Section 4.4.

The corrosion potential of the on-site materials to buried steel was evaluated in accordance with Caltrans corrosive environment evaluation criteria. Caltrans considers a site corrosive, if at least one of the following conditions exists:

- Chloride content ≥ 500 ppm;
- Soluble sulphate content ≥ 2,000 ppm;
- pH ≤ 5.5.

Observations and laboratory tests indicate that based on the Caltrans' criteria the soils at the site are considered non-corrosive. If additional recommendations are desired, it is recommended that a corrosion specialist be consulted regarding suitable types of piping and necessary protection for underground metal conduits.

8.0 CONSTRUCTION CONSIDERATIONS

Based on our field exploration program, earthwork can be performed with conventional construction equipment.

8.1 TEMPORARY DEWATERING

Groundwater was encountered within our borings at 15 feet below ground surface. Based on the anticipated excavation depths, the need for temporary dewatering is considered low.

8.2 CONSTRUCTION SLOPES

Excavations during construction should be conducted so that slope failure and excessive ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsoils, height of the excavation and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall and desiccation.

Where space permits, and providing that adjacent facilities are adequately supported, open excavations may be considered. In general, unsupported slopes for temporary construction excavations should not be expected to stand at an inclination steeper than 1:1 (horizontal:vertical). The temporary excavation side walls may be cut vertically to a height of 3 feet and then laid back at a 1:1 slope ratio above a height of 3 feet.

Surcharge loads should be kept away from the top of temporary excavations a horizontal distance equal to at least one-half the depth of excavation. Surface drainage should be controlled along the top of temporary excavations to preclude wetting of the soils and erosion of the excavation faces. Even with the implementation of the above recommendations, sloughing of the surface of the temporary excavations may still occur, and workmen should be adequately protected from such sloughing.

If site conditions do not provide sufficient space for sloped excavations at the project site, slot cutting techniques in a repeating "ABC" sequence may be required. First, all the slots designated as "A" should be excavated, backfilled and recompacted. The procedure should continue with the "B" slots and end with the "C" slots. The width of each slot should not exceed 6 feet. If any evidence of potential instability is observed, revised recommendations such as narrower slot cuts may be necessary. All slot excavation and backfilling procedures should be performed under the observation and testing of a qualified geotechnical engineer.

9.0 POST INVESTIGATION SERVICES

Final project plans and specifications should be reviewed prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. Following review of plans and specifications, observation should be performed by the geotechnical engineer during construction to document that foundation elements are founded on/or penetrate onto the recommended soils, and that suitable backfill soils are placed upon competent materials and properly compacted at the recommended moisture content.

10.0 CLOSURE

The conclusions, recommendations, and opinions presented herein are: (1) based upon our evaluation and interpretation of the limited data obtained from our field and laboratory programs; (2) based upon an interpolation of soil conditions between and beyond the borings; (3) are subject to confirmation of the actual conditions encountered during construction; and, (4) are based upon the assumption that sufficient observation and testing will be provided during construction.

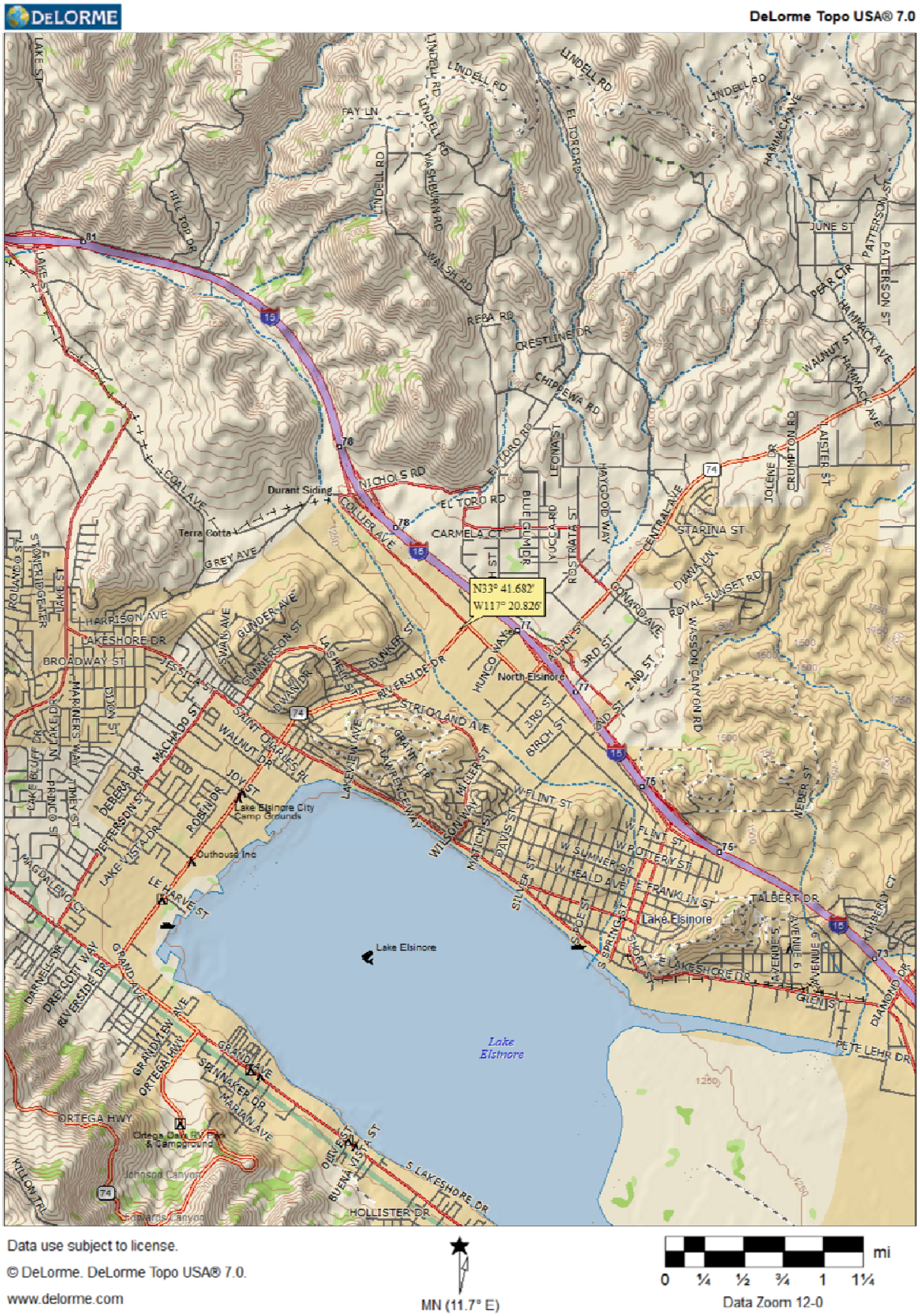
If parties other than GeoBoden are engaged to provide construction geotechnical services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the findings and recommendations in this report or providing alternate recommendations.

If pertinent changes are made in the project plans or conditions are encountered during construction that appear to be different than indicated by this report, please contact this office. Significant variations may necessitate a re-evaluation of the recommendations presented in this report.

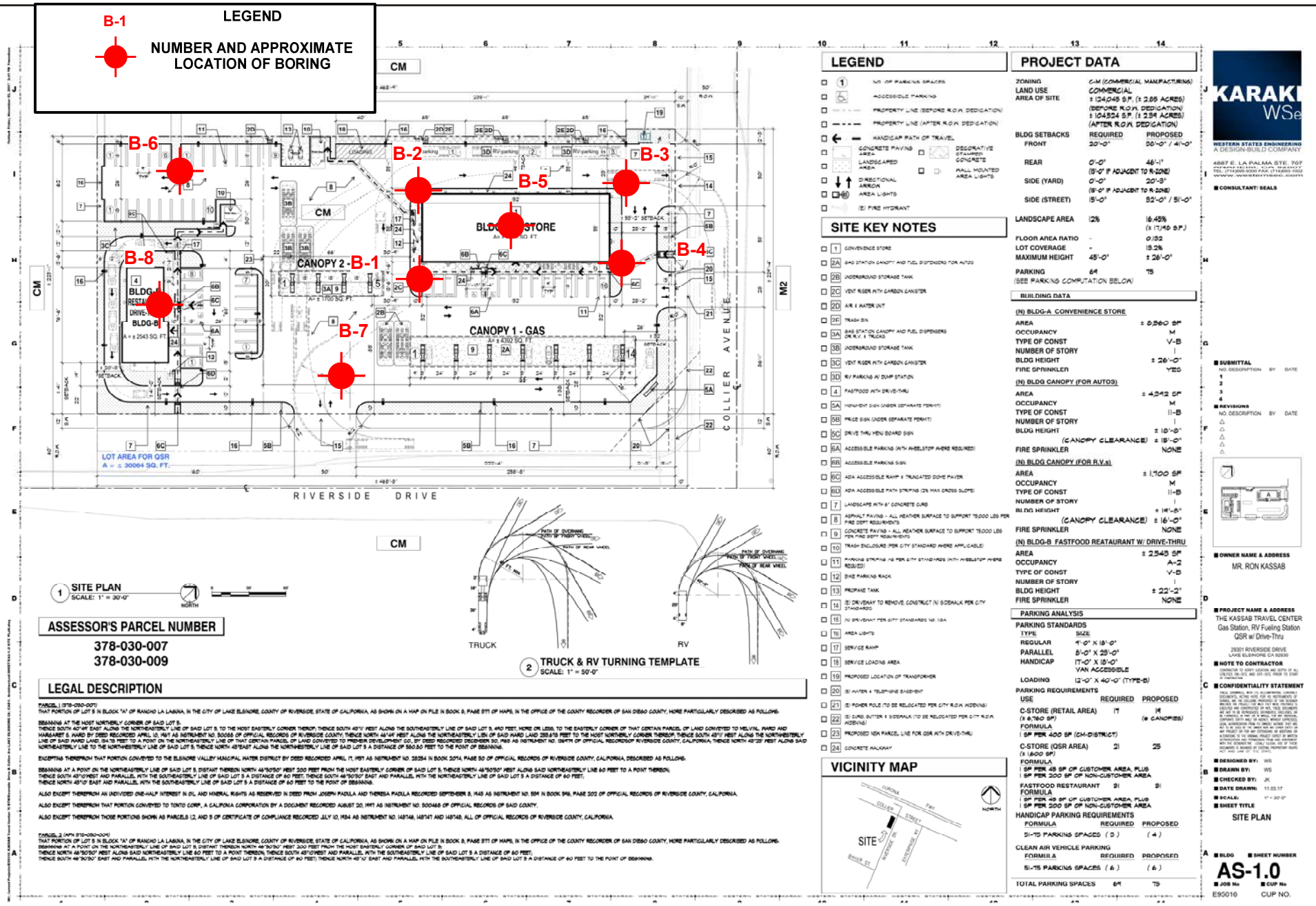
11.0 REFERENCES

California Building Code, 2016 Volume 2.

FIGURES



GEOBODEN INC. Geotechnical Consultants	**SITE VICINITY MAP** **Proposed Kassab Travel Center** **29301 Riverside Drive** **Lake Elsinore, California**	Figure By S.R.	Project No. Lake Elsinore
		Map No. XX	Figure No. 1
		Date 12-30-17	



GEOBODEN INC.
Geotechnical Consultants

BORING LOCATION PLAN
Proposed Kassab Travel Center
29301 Riverside Drive
Lake Elsinore, California

Figure By S.R.	Project No. Lake Elsinore
Map No. XX	Figure No. 2
Date 12-30-17	

APPENDIX A
BORING LOGS

APPENDIX A
SUBSURFACE EXPLORATION PROGRAM

PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Prior to drilling, the proposed borings were located in the field by measuring from existing site features.

A total of 8 exploratory borings (B-1 through B-8) were drilled using a hollow-stem auger drill rig equipped with 8-inch outside diameter (O.D.) augers and hand-auger equipment. GeoBoden, Inc. of Irvine, California performed the drilling on December 18, 2017. The borings locations are shown on Figure 2.

Depth-discrete soil samples were collected at selected intervals from the exploratory borings using a 2 ½ -inch inside diameter (I.D.) modified California Split-barrel sampler fitted with 12 brass ring of 2 ½ inches in O.D. and 1-inch in height and one brass liner (2 ½ -inch O.D. by 6 inches long) above the brass rings. The sampler was lowered to the bottom of the boreholes and driven 18 inches into the soil with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the lower 12 inches is shown on the blow count column of the boring logs.

After removing the sampler from the boreholes, the sampler was opened and the brass rings and liner containing the soil were removed and observed for soil classification. Brass rings containing the soil were sealed in plastic canisters to preserve the natural moisture content of the soil. Soil samples collected from exploratory borings were labeled, and were transported for physical testing.

Standard Penetration Tests (SPTs) were also performed. The SPT consists of driving a standard sampler, as described in the ASTM 1586 Standard Method, using a 140-pound hammer falling 30 inches. The number of blows required to drive the SPT sampler the lower 12 inches of the sampling interval is recorded on the blow count column of the boring logs.

The soil classifications and descriptions on field logs were performed using the Unified Soil Classification System as described by the American Society for Testing and Materials (ASTM) D 2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." The final boring logs were prepared from the field logs and are presented in this Appendix.

At the completion of the sampling and logging, the exploratory borings were backfilled with the drilled cuttings.

GEOBODEN, INC.

BORING NUMBER B-1

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): yellowish brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12		97	24	49	18	31	69
10		SANDY CLAY (CL): strong brown, moist, ~30% fine sand, ~70% fines	SS S-2		14			28				70
15		▽ light brown, wet	MC R-3		12							
20			SS S-4		14							
25		brown, wet	SS S-5		12							
30		SAND (SP): yellowish brown, wet, coarse sand	SS S-6		16							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER B-2

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION ___ **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY** ___
AT END OF DRILLING ---
NOTES ___
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, fine sand										
5			MC R-1		16		99	25				
10			SS S-2		11							
15		SANDY CLAY (CL): yellowish brown, moist, ~30% fine sand, ~70% fines ▽	MC R-3		12							
20		SAND (SP): light yellowish brown, wet, coarse sand	SS S-4		15							
25		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines	SS S-5		21							
30			SS S-6		26							

Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER B-3

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		13		100	26				
10			SS S-2		16							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
15		▽	MC R-3		19							
20			SS S-4		14							
25		wet	SS S-5		12							
		SAND w. SILT (SP-SM): yellowish brown, wet										
30			SS S-6		16							
		Bottom of borehole at 31.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 31.5 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER B-4

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		CLAY (CL): grayish brown, moist										
5			MC R-1		19		103	27				
		CLAY w. SAND (CL): yellowish brown, moist, ~20% fine sand, ~80% fines [NATIVE]										
10			SS S-2		26							
15		▽	MC R-3		36							
20			SS S-4		29							
		Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER B-5

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 15.00 ft
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		14		104	27				
10		CLAY (CL): brown, moist, ~10% fine sand, ~90% fines	SS S-2		11							
15	▽		MC R-3		14							
20			SS S-4		18							

Bottom of borehole at 21.5 feet below ground surface. Ground water was encountered at 15 feet. Boring was backfilled with cuttings. Bottom of borehole at 21.5 feet.

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER B-6

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		11		103	26				
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		14							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER B-7

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		12							
		SANDY CLAY (CL): brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		16							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

BORING NUMBER B-8

CLIENT Mr. Ron Kassab
PROJECT NAME Proposed Kassab Travel Center
PROJECT NUMBER Lake Elsinore-1-01
PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA
DATE STARTED 12/18/17 **COMPLETED** 12/18/17
GROUND ELEVATION **HOLE SIZE** 8 inches
DRILLING CONTRACTOR GeoBoden Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING ---
LOGGED BY C.R. **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		SANDY CLAY (CL): brown, moist, ~30% sand, ~70% fines										
5			MC R-1		16							
		SANDY CLAY (CL): light brown, moist, ~30% fine sand, ~70% fines										
10			MC R-2		18							
		Bottom of borehole at 11.5 feet below ground surface. Ground water was not encountered. Boring was backfilled with cuttings. Bottom of borehole at 11.5 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/30/17 11:38 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

APPENDIX B
LABORATORY TESTING

APPENDIX B
LABORATORY TESTING
PROPOSED KASSAB TRAVEL CENTER
29301 RIVERSIDE DRIVE
LAKE ELSINORE, CALIFORNIA

Laboratory tests were performed on selected samples to assess the engineering properties and physical characteristics of soils at the site. The following tests were performed:

- moisture content and dry density
- No. 200 Wash sieve
- Atterberg limits
- consolidation
- expansion potential
- corrosion

Test results are summarized on laboratory data sheets or presented in tabular form in this appendix.

Moisture Density Tests

The field moisture contents, as a percentage of the dry weight of the soils, were determined by weighing samples before and after oven drying. The dry density, in pounds per cubic foot, was also determined fir all relatively undisturbed ring samples collected. These analyses were performed in accordance with ASTM D 2937. The results of these determinations are shown on the boring logs in Appendix A.

No. 200 Wash Sieve

A quantitative determination of the percentage of soil finer than 0.075 mm was performed on a selected soil sample by washing the soil through the No. 200 sieve. Test procedures were performed in accordance with ASTM Method D1140. The results of the tests are shown on the boring logs.

Atterberg Limits

Liquid limit, plastic limit, and plasticity index were determined for selected soil sample in accordance with ASTM D 4318. The soil sample was air-dried and passed through a No. 40 sieve and moisturized. The liquid and plastic limit tests were performed on the fraction passing the No. 40 sieve. Results of the Atterberg limits tests are shown graphically and presented in this Appendix.

Consolidation

The test was performed in accordance with ASTM Test method D 2345. The compression curve from the consolidation test is presented in this Appendix.

Expansion Potential

Expansion index test was performed on a representative sample of the on-site soils in accordance with ASTM D4829. The result of the expansion test is summarized in Table B-1.

TABLE B-1 (Expansion Index Test Data)

Boring Designation	**Depth (ft)**	Expansion Index (EI)
B-1	0-5	22

Corrosion Potential

A selected soil sample was tested to determine the corrosivity of the site soil to steel and concrete. The soil sample was tested for soluble sulfate (Caltrans 417), soluble chloride (Caltrans 422), and pH and minimum resistivity (Caltrans 643). The results of corrosion tests are summarized in Table B-2.

TABLE B-2 (Corrosion Test Results)

Boring No.	**Depth (ft)**	**Chloride Content (Calif. 422) ppm**	**Sulfate Content (Calif. 417) % by Weight**	**pH (Calif. 643)**	**Resistivity (Calif. 643) Ohm*cm**
B-1	0-5	89	0.0178	7.6	1,058

GEOBODEN, INC.

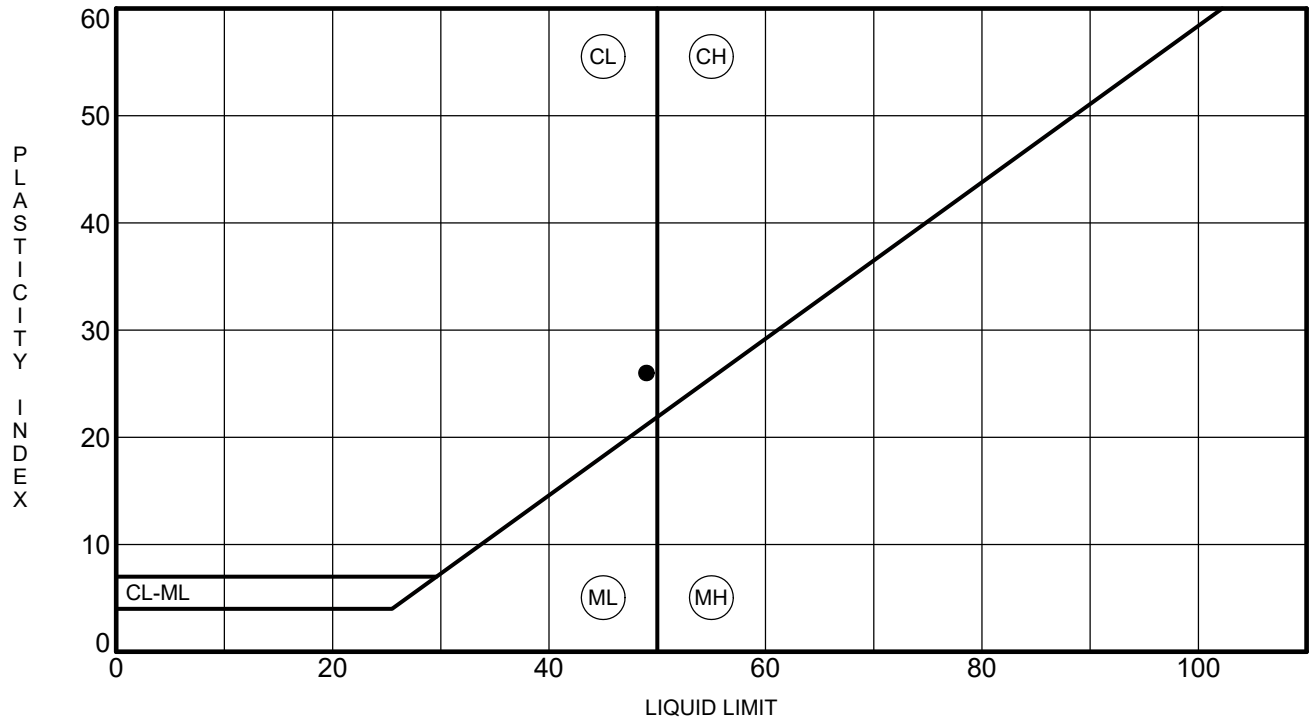
ATTERBERG LIMITS' RESULTS

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**B-1**	**5.0**	**49**	**23**	**26**	**69**	**SANDY LEAN CLAY(CL)**

ATTERBERG LIMITS - GINT STD US LAB.GDT - 12/30/17 11:40 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

GEOBODEN, INC.

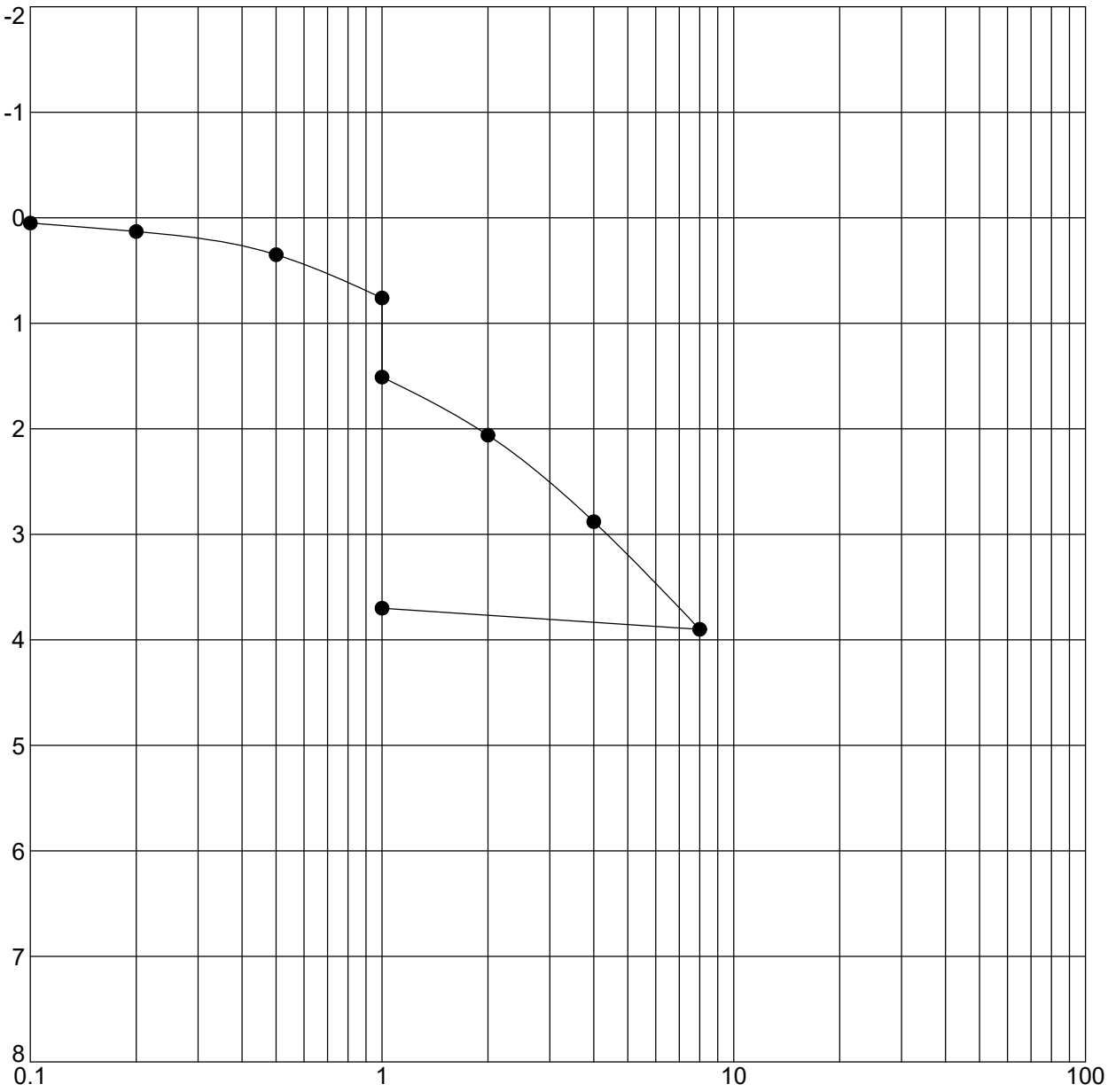
CONSOLIDATION TEST

CLIENT Mr. Ron Kassab

PROJECT NAME Proposed Kassab Travel Center

PROJECT NUMBER Lake Elsinore-1-01

PROJECT LOCATION 29301 Riverside Drive, Lake Elsinore, CA



Specimen Identification		Classification	γ_d	MC%
● B-1 5.0		**SANDY LEAN CLAY(CL)**	**97**	**24**

CONSOL STRAIN - GINT STD US LAB.GDT - 12/30/17 11:41 - C:\PASSPORT\GBI\29301 RIVERSIDE DRIVE_LAKE ELSINORE-RAHMAN\LOGS.GPJ

Appendix 4: Historical Site Conditions

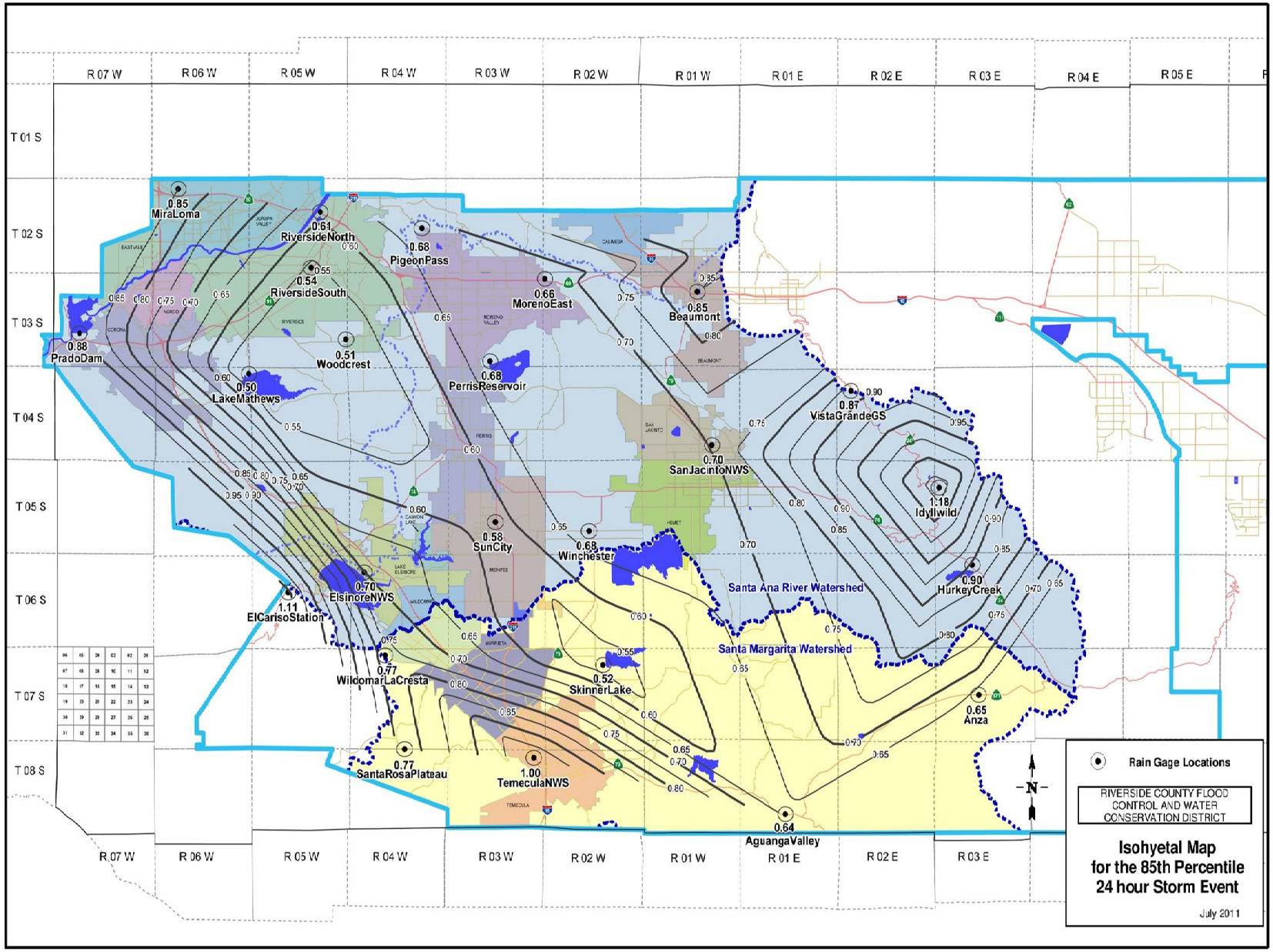
Phase I Environmental Site Assessment or Other Information on Past Site Use

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation


R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
0.85 MiraLoma
0.61 RiverSideNorth
0.68 PigeonPass
0.54 RiverSideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.68 PerrisReservoir
0.50 LakeMathews
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
Santa Ana River Watershed
Santa Margarita Watershed
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
N
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A	*27,456*	*Mixed Surface Types*	*0.86*	*0.67*	*18518.7*			
	27456		*Total*		18518.7	0.70	*1080.3*	*1,140*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 11/30/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-2/ BIOFILTRATION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA B	*26,397*	*Mixed Surface Types*	*0.96*	*0.82*	*21732.5*			
	26397	*Total*			*21732.5*	*0.70*	*1267.7*	*1,500*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 11/26/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-4/ BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA-D	*5,536*	*Concrete or Asphalt*	*1*	*0.89*	*4938.1*			
	5536		***Total***		**4938.1**	**0.70**	***288.1***	***312***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-5/ LANDSCAPE AREAS

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-E	*3,583*	*Mixed Surface Types*	*0.42*	*0.29*	*1042.9*			
	3583		*Total*		1042.9	0.70	*60.8*	*186*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-6/ LANDSCAPE AREAS

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-F	*4,697*	*Mixed Surface Types*	*0.64*	*0.44*	*2070.4*			
	4697		*Total*		*2070.4*	*0.70*	*120.8*	*121*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-7/BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-G	*5,612*	*Mixed Surface Types*	*0.62*	*0.42*	*2382.5*			
	5612		***Total***		**2382.5**	**0.70**	***139***	***176***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: RAHMAN ENGINEERING — Date: 4/25/2018

Designed by: FR — Case No:

Company Project Number/Name:

BMP Identification

BMP NAME / ID: BMP-8/LANDSCAPE AREA/BIORETENTION

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.70 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DM-H	*29,939*	*Mixed Surface Types*	*0.95*	*0.81*	*24160.1*			
	29939		*Total*		*24160.1*	*0.70*	*1409.3*	*1,410*

Notes:

Bioretention Facility - Design Procedure	BMP ID 1	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 4/25/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.63 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 1,080 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 30.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.33 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 815 ft^2

Proposed Surface Area A= 857 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Trees

Notes:

Bioretention Facility - Design Procedure	BMP ID 4	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 11/26/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.13 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 288 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 234 ft^2

Proposed Surface Area A= 254 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Shrubs

Notes:

Bioretention Facility - Design Procedure	BMP ID 5	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 4/25/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.08 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 61 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 30.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.33 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 46 ft^2

Proposed Surface Area A= 140 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Trees

Notes:

Bioretention Facility - Design Procedure	BMP ID 7	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 11/26/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.13 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 139 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.23 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 113 ft^2

Proposed Surface Area A= 143 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Shrubs

Notes:

Bioretention Facility - Design Procedure	BMP ID 8	Legend:	Required Entries / Calculated Cells

Company Name: RAHMAN ENGINEERING Date: 4/25/2018

Designed by: FR County/City Case No.:

Design Volume

Enter the area tributary to this feature A_T= 0.69 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 1,409 ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 1.5 ft

Top Width of Bioretention Facility, excluding curb w_T = 30.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.33 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 1,063 ft^2

Proposed Surface Area A= 1,172 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 2 %

6" Check Dam Spacing 25 feet

Describe Vegetation: Trees

Notes:

Appendix 7:Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

HCOC MITIGATION

Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

THIS CONDITION WAS MET BY SIZING THE OUTLET PIPE COMING OUT OF THE SITE TO CARRY A RUNOFF DISCHARGE OF NOT MORE THAN 10% OF THE 2 YR PRE DEVELOPESD HYDROGRAPH. THE RUNOFF DISCHARGE WAS CALCULATED USING THE MANNING'S FORMULA:

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

USING A 4" DIAMETER PIPE @ THE OUTLET;

$$A = (3.14)(0.33)^2/4$$

$$= 0.085 \text{ SF}$$

$$R^{2/3} = [(0.085/1.0362)]^{2/3}$$

$$= 0.187$$

$$S = .01$$

$$Q = (1.146)(0.085)(0.187)(0.1)$$

$$= 0.18 \text{ CFS} < \text{EXIST. PRE DISCHARGE @ 2 YR PEAK}$$

DMA	PRE DISCHARGE 2 YR-24 HR (CFS)	POST DISCHARGE 2 YR-24 HR (CFS)	REMARKS
A	0.30 CFS	0.18 CFS	@ OUTLET
B	0.29 CFS	0.18 CFS	@ OUTLET
H	0.26 CFS	0.18 CFS	@ OUTLET

IN CVASE OF HIGH WATER FLOWS, RUNOFF WILL FLOW INTO AN OVERFLOW GRATE INLET STRUTURE TOWARDS TO UNDERGROUND RETENTION CHAMBERS. IN AN OVERFLOW 4" PIPE WILL BE INSTALLED TO SERVE AS AN OVERFLOW DEVICE IN THE EVENT WATER RISES UP INSIDE THE CHAMBERS. THE OVERFLOW PIPE WAS SIZED TO CARRY A DISCHARGE LESS THAN THE DISCHARGE RATE ON THE PRE-DEVELOPED CONDITION.

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
Kassab Travel Center
Pre-Developed

SUB-AREA:
DMA A Outlet .00098 69. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

Kassab Travel Center
Pre-Developed

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA A	0.980E-03		0.128		12.02	0.30	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.842	0.05	0.06	0.07	0.09	0.10	0.11	0.13
11.886	0.14	0.16	0.17	0.19	0.20	0.22	0.23
11.930	0.24	0.25	0.26	0.26	0.27	0.27	0.28
11.975	0.28	0.28	0.28	0.29	0.29	0.29	0.30
12.019	0.30	0.30	0.29	0.28	0.27	0.25	0.24
12.063	0.22	0.20	0.18	0.17	0.15	0.14	0.13
12.107	0.12	0.11	0.11	0.10	0.10	0.09	0.09
12.151	0.09	0.08	0.08	0.08	0.08	0.08	0.07
12.196	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.240	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.284	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.328	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.372	0.06	0.06	0.06	0.05	0.05	0.05	0.05
12.417	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Area or Drainage Rain Gage Runoff Peak Flow

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
Pre-Developed

STORM 2-Yr

SUB-AREA:
DMA A Outlet .00098 69. .1

STREAM REACH:

Reach Identifier	Area (sq mi)	ID or Location	Amount (in)	Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.980E-03		0.128		12.02	0.30	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.842	0.05	0.06	0.07	0.09	0.10	0.11	0.13
11.886	0.14	0.16	0.17	0.19	0.20	0.22	0.23
11.930	0.24	0.25	0.26	0.26	0.27	0.27	0.28
11.975	0.28	0.28	0.28	0.29	0.29	0.29	0.30
12.019	0.30	0.30	0.29	0.28	0.27	0.25	0.24
12.063	0.22	0.20	0.18	0.17	0.15	0.14	0.13
12.107	0.12	0.11	0.11	0.10	0.10	0.09	0.09
12.151	0.09	0.08	0.08	0.08	0.08	0.08	0.07
12.196	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.240	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.284	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.328	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.372	0.06	0.06	0.06	0.05	0.05	0.05	0.05
12.417	0.05	0.05	0.05	0.05	0.05	0.05	0.05

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Pre-Developed

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)				
DMA A	0.980E-03		0.30				
OUTLET	0.980E-03		0.30				

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
Pre-Developed

STORM 2-Yr

SUB-AREA:

	DMA A	Outlet	.00098	69.	.1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
Pre-Developed

STORM 2-Yr

SUB-AREA:

	DMA A	Outlet	.00098	69.	.1

STREAM REACH:

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WinTR-20 Printed Page File      Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10                  0         0         0.05
Kassab Travel Center
2yr Post-Developed

SUB-AREA:
          DMA A     Outlet              .00098    92.       .1

STREAM REACH:

STORM ANALYSIS:
          2-Yr                          2.39      Type II   2

STRUCTURE RATING:


GLOBAL OUTPUT:
          2         0.05                YYYYN     YYYYNN



WinTR-20 Printed Page File      End of Input Data List
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Kassab Travel Center
2yr Post-Developed

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA A	0.980E-03		1.096		11.93	1.52	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.932	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.976	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.020	0.05	0.05	0.05	0.06	0.06	0.06	0.06
11.065	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.109	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.153	0.06	0.06	0.07	0.07	0.07	0.07	0.07
11.197	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.241	0.07	0.07	0.07	0.07	0.07	0.08	0.08
11.286	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.330	0.08	0.08	0.08	0.08	0.08	0.08	0.09
11.374	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.462	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.507	0.10	0.10	0.10	0.11	0.11	0.12	0.12
11.551	0.13	0.14	0.15	0.16	0.17	0.18	0.18
11.595	0.19	0.19	0.20	0.20	0.21	0.22	0.23
11.639	0.25	0.26	0.28	0.30	0.32	0.34	0.36
11.683	0.37	0.39	0.40	0.41	0.42	0.44	0.45
11.728	0.46	0.48	0.50	0.53	0.56	0.58	0.61
11.772	0.64	0.66	0.69	0.71	0.73	0.74	0.76
11.816	0.78	0.81	0.84	0.88	0.93	0.98	1.04
11.860	1.10	1.16	1.22	1.28	1.33	1.37	1.42
11.905	1.45	1.48	1.50	1.51	1.52	1.52	1.50
11.949	1.48	1.46	1.43	1.41	1.38	1.36	1.33
11.993	1.31	1.30	1.28	1.27	1.24	1.22	1.18
12.037	1.13	1.06	0.99	0.92	0.84	0.77	0.70
12.081	0.63	0.57	0.52	0.48	0.44	0.41	0.39
12.126	0.37	0.35	0.33	0.31	0.30	0.29	0.28
12.170	0.27	0.26	0.25	0.25	0.24	0.24	0.24
12.214	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.258	0.21	0.21	0.21	0.20	0.20	0.20	0.20
12.302	0.20	0.19	0.19	0.19	0.19	0.19	0.19
12.347	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.391	0.17	0.17	0.17	0.16	0.16	0.16	0.16
12.435	0.16	0.16	0.15	0.15	0.15	0.15	0.14

12.479	0.14	0.14	0.14	0.14	0.14	0.14	0.13
12.523	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.568	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.612	0.12	0.11	0.11	0.11	0.11	0.11	0.11
12.656	0.11	0.11	0.11	0.11	0.11	0.11	0.11

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Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
12.700	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.745	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.789	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.833	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.877	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.921	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.966	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.010	0.09	0.09	0.09	0.09	0.08	0.08	0.08
13.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.231	0.08	0.08	0.08	0.08	0.07	0.07	0.07
13.275	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.319	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.540	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.585	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.629	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.673	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.717	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.761	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.806	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.850	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.894	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.938	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.982	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.027	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.071	0.05	0.05	0.05	0.05	0.05		

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.980E-03		1.096		11.93	1.52	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.932	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.976	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.020	0.05	0.05	0.05	0.06	0.06	0.06	0.06
11.065	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.109	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.153	0.06	0.06	0.07	0.07	0.07	0.07	0.07
11.197	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.241	0.07	0.07	0.07	0.07	0.07	0.08	0.08

Kassab Travel Center
2yr Post-Developed

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.286	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.330	0.08	0.08	0.08	0.08	0.08	0.08	0.09
11.374	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
2yr Post-Developed

STORM 2-Yr

SUB-AREA:
DMA A Outlet .00098 92. .1

STREAM REACH:

11.418	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.462	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.507	0.10	0.10	0.10	0.11	0.11	0.12	0.12
11.551	0.13	0.14	0.15	0.16	0.17	0.18	0.18
11.595	0.19	0.19	0.20	0.20	0.21	0.22	0.23
11.639	0.25	0.26	0.28	0.30	0.32	0.34	0.36
11.683	0.37	0.39	0.40	0.41	0.42	0.44	0.45
11.728	0.46	0.48	0.50	0.53	0.56	0.58	0.61
11.772	0.64	0.66	0.69	0.71	0.73	0.74	0.76
11.816	0.78	0.81	0.84	0.88	0.93	0.98	1.04
11.860	1.10	1.16	1.22	1.28	1.33	1.37	1.42
11.905	1.45	1.48	1.50	1.51	1.52	1.52	1.50
11.949	1.48	1.46	1.43	1.41	1.38	1.36	1.33
11.993	1.31	1.30	1.28	1.27	1.24	1.22	1.18
12.037	1.13	1.06	0.99	0.92	0.84	0.77	0.70
12.081	0.63	0.57	0.52	0.48	0.44	0.41	0.39
12.126	0.37	0.35	0.33	0.31	0.30	0.29	0.28
12.170	0.27	0.26	0.25	0.25	0.24	0.24	0.24
12.214	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.258	0.21	0.21	0.21	0.20	0.20	0.20	0.20
12.302	0.20	0.19	0.19	0.19	0.19	0.19	0.19
12.347	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.391	0.17	0.17	0.17	0.16	0.16	0.16	0.16
12.435	0.16	0.16	0.15	0.15	0.15	0.15	0.14
12.479	0.14	0.14	0.14	0.14	0.14	0.14	0.13
12.523	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.568	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.612	0.12	0.11	0.11	0.11	0.11	0.11	0.11
12.656	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.700	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.745	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.789	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.833	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.877	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.921	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.966	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.010	0.09	0.09	0.09	0.09	0.08	0.08	0.08
13.054	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.098	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.142	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.187	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.231	0.08	0.08	0.08	0.08	0.07	0.07	0.07
13.275	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.319	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.363	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.408	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.452	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.496	0.07	0.07	0.07	0.07	0.07	0.07	0.07

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
13.540	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.585	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
b Travel Center (continued)
2yr Post-Developed

STORM 2-Yr

SUB-AREA:
DMA A Outlet .00098 92. .1

STREAM REACH:

13.629	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.673	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.717	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.761	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.806	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.850	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.894	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.938	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.982	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.027	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.071	0.05	0.05	0.05	0.05	0.05		

Kassab Travel Center
2yr Post-Developed

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA A	0.980E-03		1.52				

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WinTR-20: Version 1.10                  0         0         0.05
b Travel Center                                                          (continued)
2yr Post-Developed
                                           STORM 2-Yr
SUB-AREA:
          DMA A     Outlet              .00098    92.       .1

STREAM REACH:
OUTLET    0.980E-03                1.52
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WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
KASSAB TRAVEL CENTER
PRE DEVELOPED

SUB-AREA:
DMA B Outlet .00095 69. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

KASSAB TRAVEL CENTER
PRE DEVELOPED

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA B	0.950E-03		0.126		12.02	0.29	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.848	0.06	0.07	0.08	0.10	0.11	0.12	0.14
11.892	0.15	0.17	0.18	0.20	0.21	0.22	0.23
11.937	0.24	0.25	0.26	0.26	0.26	0.27	0.27
11.981	0.27	0.28	0.28	0.28	0.29	0.29	0.29
12.025	0.29	0.28	0.27	0.26	0.25	0.23	0.21
12.069	0.19	0.18	0.16	0.15	0.14	0.13	0.12
12.114	0.11	0.10	0.10	0.09	0.09	0.09	0.08
12.158	0.08	0.08	0.08	0.08	0.07	0.07	0.07
12.202	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.246	0.07	0.06	0.06	0.06	0.06	0.06	0.06
12.290	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.335	0.06	0.06	0.06	0.06	0.06	0.06	0.05
12.379	0.05	0.05	0.05	0.05	0.05	0.05	0.05
12.423	0.05	0.05	0.05				

Area or	Drainage	Rain Gage	Runoff	Peak Flow

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA B	Outlet	.00095	69.	.1	

STREAM REACH:

Reach Identifier	Area (sq mi)	ID or Location	Amount (in)	Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.950E-03		0.126		12.02	0.29	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.848	0.06	0.07	0.08	0.10	0.11	0.12	0.14
11.892	0.15	0.17	0.18	0.20	0.21	0.22	0.23
11.937	0.24	0.25	0.26	0.26	0.26	0.27	0.27
11.981	0.27	0.28	0.28	0.28	0.29	0.29	0.29
12.025	0.29	0.28	0.27	0.26	0.25	0.23	0.21
12.069	0.19	0.18	0.16	0.15	0.14	0.13	0.12
12.114	0.11	0.10	0.10	0.09	0.09	0.09	0.08
12.158	0.08	0.08	0.08	0.08	0.07	0.07	0.07
12.202	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.246	0.07	0.06	0.06	0.06	0.06	0.06	0.06
12.290	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.335	0.06	0.06	0.06	0.06	0.06	0.06	0.05
12.379	0.05	0.05	0.05	0.05	0.05	0.05	0.05
12.423	0.05	0.05	0.05				

KASSAB TRAVEL CENTER
PRE DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)				
DMA B	0.950E-03		0.29				
OUTLET	0.950E-03		0.29				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 69. .1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 69. .1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
KASSAB TRAVEL CENTER
POST DEVELOPED

SUB-AREA:
DMA B Outlet .00095 92. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

KASSAB TRAVEL CENTER
POST DEVELOPED

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA B	0.950E-03		1.088		11.93	1.47	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.963	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.008	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.052	0.05	0.05	0.06	0.06	0.06	0.06	0.06
11.096	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.140	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.185	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.229	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.273	0.07	0.07	0.07	0.08	0.08	0.08	0.08
11.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.361	0.08	0.08	0.08	0.08	0.08	0.09	0.09
11.406	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.450	0.09	0.09	0.09	0.09	0.09	0.09	0.10
11.494	0.10	0.10	0.10	0.10	0.10	0.10	0.11
11.538	0.11	0.12	0.13	0.14	0.15	0.15	0.16
11.582	0.17	0.18	0.18	0.19	0.19	0.20	0.21
11.627	0.21	0.23	0.24	0.26	0.27	0.29	0.31
11.671	0.33	0.35	0.36	0.38	0.39	0.40	0.41
11.715	0.42	0.44	0.45	0.47	0.49	0.51	0.54
11.759	0.57	0.59	0.62	0.64	0.67	0.69	0.71
11.803	0.72	0.74	0.76	0.78	0.81	0.85	0.90
11.848	0.95	1.01	1.07	1.13	1.18	1.24	1.29
11.892	1.33	1.37	1.41	1.43	1.45	1.47	1.47
11.936	1.47	1.46	1.44	1.42	1.39	1.36	1.34
11.980	1.31	1.29	1.27	1.26	1.24	1.23	1.21
12.025	1.18	1.14	1.09	1.03	0.96	0.89	0.82
12.069	0.74	0.68	0.61	0.56	0.51	0.46	0.43
12.113	0.40	0.38	0.35	0.34	0.32	0.30	0.29
12.157	0.28	0.27	0.26	0.25	0.25	0.24	0.24
12.201	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.246	0.21	0.21	0.21	0.20	0.20	0.20	0.19
12.290	0.19	0.19	0.19	0.19	0.19	0.19	0.18
12.334	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.378	0.17	0.17	0.16	0.16	0.16	0.16	0.16
12.422	0.16	0.16	0.15	0.15	0.15	0.15	0.15
12.467	0.14	0.14	0.14	0.14	0.13	0.13	0.13

12.511	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.555	0.12	0.12	0.12	0.12	0.12	0.11	0.11
12.599	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.643	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.688	0.10	0.10	0.10	0.10	0.10	0.10	0.10

KASSAB TRAVEL CENTER
POST DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
12.732	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.776	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.820	0.10	0.10	0.10	0.09	0.09	0.09	0.09
12.865	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.909	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.953	0.09	0.09	0.09	0.09	0.09	0.08	0.08
12.997	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.041	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.086	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.130	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.174	0.08	0.08	0.07	0.07	0.07	0.07	0.07
13.218	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.262	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.307	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.351	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.395	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.439	0.07	0.07	0.07	0.07	0.07	0.06	0.06
13.483	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.528	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.572	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.616	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.660	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.705	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.749	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.793	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.837	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.881	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.926	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.970	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.014	0.05	0.05					

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.950E-03		1.088		11.93	1.47	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.963	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.008	0.05	0.05	0.05	0.05	0.05	0.05	0.05
11.052	0.05	0.05	0.06	0.06	0.06	0.06	0.06
11.096	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.140	0.06	0.06	0.06	0.06	0.06	0.06	0.06
11.185	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.229	0.07	0.07	0.07	0.07	0.07	0.07	0.07
11.273	0.07	0.07	0.07	0.08	0.08	0.08	0.08
11.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
11.361	0.08	0.08	0.08	0.08	0.08	0.09	0.09

KASSAB TRAVEL CENTER
POST DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.406	0.09	0.09	0.09	0.09	0.09	0.09	0.09
11.450	0.09	0.09	0.09	0.09	0.09	0.09	0.10
11.494	0.10	0.10	0.10	0.10	0.10	0.10	0.11

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
POST DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 92. .1

STREAM REACH:

11.538	0.11	0.12	0.13	0.14	0.15	0.15	0.16
11.582	0.17	0.18	0.18	0.19	0.19	0.20	0.21
11.627	0.21	0.23	0.24	0.26	0.27	0.29	0.31
11.671	0.33	0.35	0.36	0.38	0.39	0.40	0.41
11.715	0.42	0.44	0.45	0.47	0.49	0.51	0.54
11.759	0.57	0.59	0.62	0.64	0.67	0.69	0.71
11.803	0.72	0.74	0.76	0.78	0.81	0.85	0.90
11.848	0.95	1.01	1.07	1.13	1.18	1.24	1.29
11.892	1.33	1.37	1.41	1.43	1.45	1.47	1.47
11.936	1.47	1.46	1.44	1.42	1.39	1.36	1.34
11.980	1.31	1.29	1.27	1.26	1.24	1.23	1.21
12.025	1.18	1.14	1.09	1.03	0.96	0.89	0.82
12.069	0.74	0.68	0.61	0.56	0.51	0.46	0.43
12.113	0.40	0.38	0.35	0.34	0.32	0.30	0.29
12.157	0.28	0.27	0.26	0.25	0.25	0.24	0.24
12.201	0.23	0.23	0.23	0.22	0.22	0.22	0.21
12.246	0.21	0.21	0.21	0.20	0.20	0.20	0.19
12.290	0.19	0.19	0.19	0.19	0.19	0.19	0.18
12.334	0.18	0.18	0.18	0.18	0.17	0.17	0.17
12.378	0.17	0.17	0.16	0.16	0.16	0.16	0.16
12.422	0.16	0.16	0.15	0.15	0.15	0.15	0.15
12.467	0.14	0.14	0.14	0.14	0.13	0.13	0.13
12.511	0.13	0.13	0.13	0.13	0.13	0.13	0.12
12.555	0.12	0.12	0.12	0.12	0.12	0.11	0.11
12.599	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.643	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.688	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.732	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.776	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.820	0.10	0.10	0.10	0.09	0.09	0.09	0.09
12.865	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.909	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.953	0.09	0.09	0.09	0.09	0.09	0.08	0.08
12.997	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.041	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.086	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.130	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.174	0.08	0.08	0.07	0.07	0.07	0.07	0.07
13.218	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.262	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.307	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.351	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.395	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.439	0.07	0.07	0.07	0.07	0.07	0.06	0.06
13.483	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.528	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.572	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.616	0.06	0.06	0.06	0.06	0.06	0.06	0.06

Line Start Time (hr) — Flow Values @ time increment of 0.006 hr (cfs)

13.660	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.705	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CENTER (continued)
POST DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA B Outlet .00095 92. .1

STREAM REACH:

13.749	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.793	0.06	0.06	0.06	0.06	0.06	0.06	0.05
13.837	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.881	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.926	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.970	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.014	0.05	0.05					

KASSAB TRAVEL CENTER
POST DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA B	0.950E-03		1.47				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

```
WinTR-20: Version 1.10                  0         0         0.05
B TRAVEL CENTER                                                                (continued)
POST DEVELOPED
                                           STORM 2-Yr
SUB-AREA:
          DMA B     Outlet              .00095    92.       .1

STREAM REACH:
OUTLET    0.950E-03                 1.47
```

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
KASSAB TRAVEL CTR
PRE DEVELOPED

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

STORM ANALYSIS:
2-Yr 2.39 Type II 2

STRUCTURE RATING:

GLOBAL OUTPUT:
2 0.05 YYYYN YYYYNN

WinTR-20 Printed Page File End of Input Data List

KASSAB TRAVEL CTR
PRE DEVELOPED

Name of printed page file:
TR20.out

STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA G	0.002		0.173		12.02	0.55	304.11

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
11.829	0.06	0.08	0.09	0.11	0.13	0.16	0.18
11.874	0.21	0.24	0.26	0.29	0.32	0.35	0.38
11.918	0.40	0.43	0.45	0.46	0.48	0.49	0.50
11.962	0.50	0.51	0.51	0.52	0.52	0.53	0.54
12.006	0.54	0.55	0.55	0.55	0.54	0.52	0.50
12.050	0.47	0.44	0.40	0.37	0.34	0.31	0.28
12.095	0.26	0.24	0.22	0.21	0.20	0.19	0.18
12.139	0.17	0.17	0.16	0.16	0.15	0.15	0.14
12.183	0.14	0.14	0.14	0.13	0.13	0.13	0.13
12.227	0.13	0.13	0.13	0.12	0.12	0.12	0.12
12.271	0.12	0.12	0.12	0.12	0.11	0.11	0.11
12.316	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.360	0.11	0.11	0.10	0.10	0.10	0.10	0.10
12.404	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.448	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.492	0.09	0.08	0.08	0.08	0.08	0.08	0.08
12.537	0.08	0.08	0.08	0.08	0.08	0.08	0.08
12.581	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.625	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.669	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.714	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.758	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.802	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.846	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.890	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.935	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.979	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.023	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.111	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.156	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.200	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.244	0.05	0.05	0.05	0.05	0.05	0.05	

Area or	Drainage	Rain Gage	Runoff	Peak Flow

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

Reach Identifier	Area (sq mi)	ID or Location	Amount (in)	Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.002		0.173		12.02	0.55	304.11

KASSAB TRAVEL CTR
PRE DEVELOPED

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:
Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.829	0.06	0.08	0.09	0.11	0.13	0.16	0.18
11.874	0.21	0.24	0.26	0.29	0.32	0.35	0.38
11.918	0.40	0.43	0.45	0.46	0.48	0.49	0.50
11.962	0.50	0.51	0.51	0.52	0.52	0.53	0.54
12.006	0.54	0.55	0.55	0.55	0.54	0.52	0.50
12.050	0.47	0.44	0.40	0.37	0.34	0.31	0.28
12.095	0.26	0.24	0.22	0.21	0.20	0.19	0.18

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

12.139	0.17	0.17	0.16	0.16	0.15	0.15	0.14
12.183	0.14	0.14	0.14	0.13	0.13	0.13	0.13
12.227	0.13	0.13	0.13	0.12	0.12	0.12	0.12
12.271	0.12	0.12	0.12	0.12	0.11	0.11	0.11
12.316	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.360	0.11	0.11	0.10	0.10	0.10	0.10	0.10
12.404	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.448	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.492	0.09	0.08	0.08	0.08	0.08	0.08	0.08
12.537	0.08	0.08	0.08	0.08	0.08	0.08	0.08
12.581	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

12.625	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.669	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.714	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.758	0.07	0.07	0.07	0.07	0.06	0.06	0.06
12.802	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.846	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.890	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.935	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.979	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.023	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05

```
WinTR-20: Version 1.10                  0         0         0.05
B TRAVEL CTR                                                                (continued)
PRE DEVELOPED
                                          STORM 2-Yr
SUB-AREA:
          DMA G     Outlet              .00181    69.       .1

STREAM REACH:
    13.111      0.05      0.05      0.05      0.05      0.05      0.05      0.05
    13.156      0.05      0.05      0.05      0.05      0.05      0.05      0.05
    13.200      0.05      0.05      0.05      0.05      0.05      0.05      0.05
    13.244      0.05      0.05      0.05      0.05      0.05      0.05
```

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA G	Outlet	.00181	69.	.1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

KASSAB TRAVEL CTR
PRE DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA G	0.002		0.55				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:
OUTLET 0.002 0.55

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA G	Outlet	.00181	69.	.1

STREAM REACH:

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:

DMA G	Outlet	.00181	69.	.1

STREAM REACH:

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
PRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 69. .1

STREAM REACH:

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WinTR-20 Printed Page File      Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10                  0         0         0.05
KASSAB TRAVEL CTR
POSTRE DEVELOPED

SUB-AREA:
          DMA G     Outlet              .00181    92.       .1

STREAM REACH:

STORM ANALYSIS:
          2-Yr                          2.39      Type II   2

STRUCTURE RATING:


GLOBAL OUTPUT:
          2         0.05                YYYYN     YYYYNN



WinTR-20 Printed Page File      End of Input Data List

                                KASSAB TRAVEL CTR
                                POSTRE DEVELOPED

                           Name of printed page file:
                                TR20.out

                                        STORM 2-Yr
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Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
DMA G	0.002		1.326		11.93	2.81	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.193	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.237	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.281	0.05	0.05	0.05	0.05	0.05	0.05	0.06
10.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.547	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.591	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.635	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.679	0.07	0.07	0.08	0.08	0.08	0.08	0.08
10.723	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.768	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.812	0.08	0.08	0.08	0.08	0.09	0.09	0.09
10.856	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.900	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.945	0.09	0.09	0.09	0.10	0.10	0.10	0.10
10.989	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.033	0.10	0.10	0.10	0.10	0.10	0.11	0.11
11.077	0.11	0.11	0.11	0.11	0.11	0.11	0.11
11.121	0.11	0.11	0.11	0.12	0.12	0.12	0.12
11.166	0.12	0.12	0.12	0.12	0.13	0.13	0.13
11.210	0.13	0.13	0.13	0.13	0.13	0.13	0.13
11.254	0.14	0.14	0.14	0.14	0.14	0.14	0.14
11.298	0.14	0.15	0.15	0.15	0.15	0.15	0.15
11.342	0.15	0.15	0.15	0.16	0.16	0.16	0.16
11.387	0.16	0.16	0.16	0.16	0.17	0.17	0.17
11.431	0.17	0.17	0.17	0.17	0.17	0.18	0.18
11.475	0.18	0.18	0.18	0.18	0.18	0.19	0.19
11.519	0.19	0.20	0.21	0.22	0.23	0.25	0.26
11.563	0.28	0.29	0.31	0.32	0.34	0.35	0.36
11.608	0.37	0.38	0.39	0.41	0.43	0.46	0.49
11.652	0.52	0.56	0.59	0.63	0.66	0.69	0.72
11.696	0.74	0.76	0.78	0.80	0.83	0.86	0.89

11.740	0.93	0.98	1.03	1.08	1.13	1.18	1.23
11.785	1.27	1.31	1.34	1.38	1.41	1.45	1.49
11.829	1.55	1.62	1.71	1.81	1.92	2.03	2.15
11.873	2.25	2.36	2.45	2.54	2.61	2.68	2.73
11.917	2.77	2.80	2.81	2.80	2.78	2.74	2.70

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.961	2.65	2.60	2.55	2.50	2.46	2.43	2.40
12.006	2.37	2.34	2.30	2.24	2.17	2.08	1.96
12.050	1.83	1.70	1.56	1.42	1.29	1.17	1.06
12.094	0.96	0.89	0.82	0.76	0.72	0.68	0.64
12.138	0.61	0.58	0.56	0.53	0.51	0.50	0.48
12.182	0.47	0.46	0.45	0.44	0.44	0.43	0.42
12.227	0.42	0.41	0.41	0.40	0.40	0.39	0.39
12.271	0.38	0.38	0.37	0.37	0.36	0.36	0.36
12.315	0.36	0.35	0.35	0.35	0.34	0.34	0.34
12.359	0.33	0.33	0.32	0.32	0.32	0.31	0.31
12.403	0.31	0.30	0.30	0.30	0.30	0.29	0.29
12.448	0.29	0.28	0.28	0.27	0.27	0.26	0.26
12.492	0.26	0.25	0.25	0.25	0.25	0.25	0.24
12.536	0.24	0.24	0.24	0.23	0.23	0.23	0.22
12.580	0.22	0.22	0.22	0.22	0.21	0.21	0.21
12.625	0.21	0.21	0.21	0.21	0.21	0.20	0.20
12.669	0.20	0.20	0.20	0.20	0.20	0.20	0.20
12.713	0.20	0.20	0.20	0.19	0.19	0.19	0.19
12.757	0.19	0.19	0.19	0.19	0.19	0.19	0.19
12.801	0.18	0.18	0.18	0.18	0.18	0.18	0.18
12.846	0.18	0.18	0.18	0.18	0.18	0.17	0.17
12.890	0.17	0.17	0.17	0.17	0.17	0.17	0.17
12.934	0.17	0.17	0.17	0.17	0.17	0.16	0.16
12.978	0.16	0.16	0.16	0.16	0.16	0.16	0.16
13.022	0.16	0.16	0.16	0.16	0.16	0.15	0.15
13.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.111	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.155	0.15	0.14	0.14	0.14	0.14	0.14	0.14
13.199	0.14	0.14	0.14	0.14	0.14	0.14	0.14
13.243	0.14	0.14	0.14	0.14	0.14	0.14	0.14
13.288	0.14	0.14	0.14	0.13	0.13	0.13	0.13
13.332	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.376	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.420	0.13	0.13	0.13	0.13	0.13	0.13	0.12
13.465	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.509	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.553	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.597	0.12	0.12	0.12	0.12	0.11	0.11	0.11
13.641	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.686	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.730	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.774	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.818	0.11	0.10	0.10	0.10	0.10	0.10	0.10
13.862	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.907	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.951	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.995	0.10	0.10	0.10	0.10	0.10	0.10	0.09
14.039	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.083	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.128	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.172	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.216	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.260	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.305	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.349	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.393	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.437	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.481	0.09	0.09	0.09	0.09	0.09	0.09	0.08
14.526	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.570	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.614	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.658	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.702	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.791	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.835	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.879	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.923	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.968	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.012	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.056	0.08	0.08	0.08	0.08	0.08	0.08	0.07
15.100	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.145	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.189	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.233	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.277	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.321	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.366	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.410	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.454	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.498	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

15.542	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.587	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.631	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.675	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.719	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.763	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.852	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.896	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.940	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.985	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.029	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.073	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.117	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.161	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.206	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.250	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.294	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.338	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.382	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.427	0.06	0.06	0.06	0.06	0.06	0.06	0.06

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
16.471	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.515	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.559	0.06	0.06	0.05	0.05	0.05	0.05	0.05
16.603	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.648	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.692	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.736	0.05	0.05	0.05	0.05	0.05	0.05	0.05

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

16.780	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.825	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.869	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.913	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.957	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.001	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.046	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.090	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.134	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.178	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.222	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.267	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.311	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.355	0.05	0.05	0.05	0.05			

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
OUTLET	0.002		1.326		11.93	2.81	1550.32

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
10.193	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.237	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.281	0.05	0.05	0.05	0.05	0.05	0.05	0.06
10.326	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.370	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.414	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.458	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.547	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.591	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.635	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.679	0.07	0.07	0.08	0.08	0.08	0.08	0.08
10.723	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

10.768	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.812	0.08	0.08	0.08	0.08	0.09	0.09	0.09
10.856	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.900	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.945	0.09	0.09	0.09	0.10	0.10	0.10	0.10
10.989	0.10	0.10	0.10	0.10	0.10	0.10	0.10

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.033	0.10	0.10	0.10	0.10	0.10	0.11	0.11
11.077	0.11	0.11	0.11	0.11	0.11	0.11	0.11
11.121	0.11	0.11	0.11	0.12	0.12	0.12	0.12
11.166	0.12	0.12	0.12	0.12	0.13	0.13	0.13
11.210	0.13	0.13	0.13	0.13	0.13	0.13	0.13
11.254	0.14	0.14	0.14	0.14	0.14	0.14	0.14
11.298	0.14	0.15	0.15	0.15	0.15	0.15	0.15
11.342	0.15	0.15	0.15	0.16	0.16	0.16	0.16
11.387	0.16	0.16	0.16	0.16	0.17	0.17	0.17
11.431	0.17	0.17	0.17	0.17	0.17	0.18	0.18
11.475	0.18	0.18	0.18	0.18	0.18	0.19	0.19
11.519	0.19	0.20	0.21	0.22	0.23	0.25	0.26
11.563	0.28	0.29	0.31	0.32	0.34	0.35	0.36
11.608	0.37	0.38	0.39	0.41	0.43	0.46	0.49
11.652	0.52	0.56	0.59	0.63	0.66	0.69	0.72
11.696	0.74	0.76	0.78	0.80	0.83	0.86	0.89
11.740	0.93	0.98	1.03	1.08	1.13	1.18	1.23
11.785	1.27	1.31	1.34	1.38	1.41	1.45	1.49
11.829	1.55	1.62	1.71	1.81	1.92	2.03	2.15
11.873	2.25	2.36	2.45	2.54	2.61	2.68	2.73
11.917	2.77	2.80	2.81	2.80	2.78	2.74	2.70
11.961	2.65	2.60	2.55	2.50	2.46	2.43	2.40

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

12.006	2.37	2.34	2.30	2.24	2.17	2.08	1.96
12.050	1.83	1.70	1.56	1.42	1.29	1.17	1.06
12.094	0.96	0.89	0.82	0.76	0.72	0.68	0.64
12.138	0.61	0.58	0.56	0.53	0.51	0.50	0.48
12.182	0.47	0.46	0.45	0.44	0.44	0.43	0.42
12.227	0.42	0.41	0.41	0.40	0.40	0.39	0.39
12.271	0.38	0.38	0.37	0.37	0.36	0.36	0.36
12.315	0.36	0.35	0.35	0.35	0.34	0.34	0.34
12.359	0.33	0.33	0.32	0.32	0.32	0.31	0.31
12.403	0.31	0.30	0.30	0.30	0.30	0.29	0.29
12.448	0.29	0.28	0.28	0.27	0.27	0.26	0.26
12.492	0.26	0.25	0.25	0.25	0.25	0.25	0.24
12.536	0.24	0.24	0.24	0.23	0.23	0.23	0.22
12.580	0.22	0.22	0.22	0.22	0.21	0.21	0.21
12.625	0.21	0.21	0.21	0.21	0.21	0.20	0.20
12.669	0.20	0.20	0.20	0.20	0.20	0.20	0.20
12.713	0.20	0.20	0.20	0.19	0.19	0.19	0.19
12.757	0.19	0.19	0.19	0.19	0.19	0.19	0.19
12.801	0.18	0.18	0.18	0.18	0.18	0.18	0.18
12.846	0.18	0.18	0.18	0.18	0.18	0.17	0.17
12.890	0.17	0.17	0.17	0.17	0.17	0.17	0.17
12.934	0.17	0.17	0.17	0.17	0.17	0.16	0.16
12.978	0.16	0.16	0.16	0.16	0.16	0.16	0.16
13.022	0.16	0.16	0.16	0.16	0.16	0.15	0.15
13.067	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.111	0.15	0.15	0.15	0.15	0.15	0.15	0.15
13.155	0.15	0.14	0.14	0.14	0.14	0.14	0.14
13.199	0.14	0.14	0.14	0.14	0.14	0.14	0.14
13.243	0.14	0.14	0.14	0.14	0.14	0.14	0.14

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

13.288	0.14	0.14	0.14	0.13	0.13	0.13	0.13
13.332	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.376	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.420	0.13	0.13	0.13	0.13	0.13	0.13	0.12
13.465	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.509	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.553	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.597	0.12	0.12	0.12	0.12	0.11	0.11	0.11
13.641	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.686	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.730	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.774	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.818	0.11	0.10	0.10	0.10	0.10	0.10	0.10
13.862	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.907	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.951	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.995	0.10	0.10	0.10	0.10	0.10	0.10	0.09
14.039	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.083	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.128	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.172	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.216	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.260	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.305	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.349	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.393	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.437	0.09	0.09	0.09	0.09	0.09	0.09	0.09
14.481	0.09	0.09	0.09	0.09	0.09	0.09	0.08
14.526	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.570	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.614	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.658	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.702	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.747	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.791	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.835	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.879	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

14.923	0.08	0.08	0.08	0.08	0.08	0.08	0.08
14.968	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.012	0.08	0.08	0.08	0.08	0.08	0.08	0.08
15.056	0.08	0.08	0.08	0.08	0.08	0.08	0.07
15.100	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.145	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.189	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.233	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.277	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.321	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.366	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.410	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.454	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.498	0.07	0.07	0.07	0.07	0.07	0.07	0.07

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)						
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.542	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.587	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.631	0.07	0.07	0.07	0.07	0.07	0.07	0.07
15.675	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.719	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.763	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.808	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.852	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.896	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.940	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.985	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.029	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.073	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.117	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

16.161	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.206	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.250	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.294	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.338	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.382	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.427	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.471	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.515	0.06	0.06	0.06	0.06	0.06	0.06	0.06
16.559	0.06	0.06	0.05	0.05	0.05	0.05	0.05
16.603	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.648	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.692	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.736	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.780	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.825	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.869	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.913	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.957	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.001	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.046	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.090	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.134	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.178	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.222	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.267	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.311	0.05	0.05	0.05	0.05	0.05	0.05	0.05
17.355	0.05	0.05	0.05	0.05			

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

KASSAB TRAVEL CTR
POSTRE DEVELOPED

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
DMA G	0.002		2.81				
OUTLET	0.002		2.81				

WinTR-20 Printed Page File Beginning of Input Data List
TR20.inp

WinTR-20: Version 1.10 0 0 0.05
B TRAVEL CTR (continued)
POSTRE DEVELOPED

STORM 2-Yr

SUB-AREA:
DMA G Outlet .00181 92. .1

STREAM REACH:

User Inputs

Chamber Model	MC-3500
Outlet Control Structure	Yes (Outlet)
Project Name	KASSAB -DMA A
Project Location	RIVERSIDE DR, RIVERSIDE
Project Date	11/07/2018
Engineer	RRF
Measurement Type	Imperial
Required Storage Volume	2600 cubic ft.
Stone Porosity	40%
Stone Above Chambers	12 in.
Stone Foundation Depth	9 in.
Average Cover Over Chambers	24 in.
Design Constraint	Length
Design Constraint Dimension	50 ft.

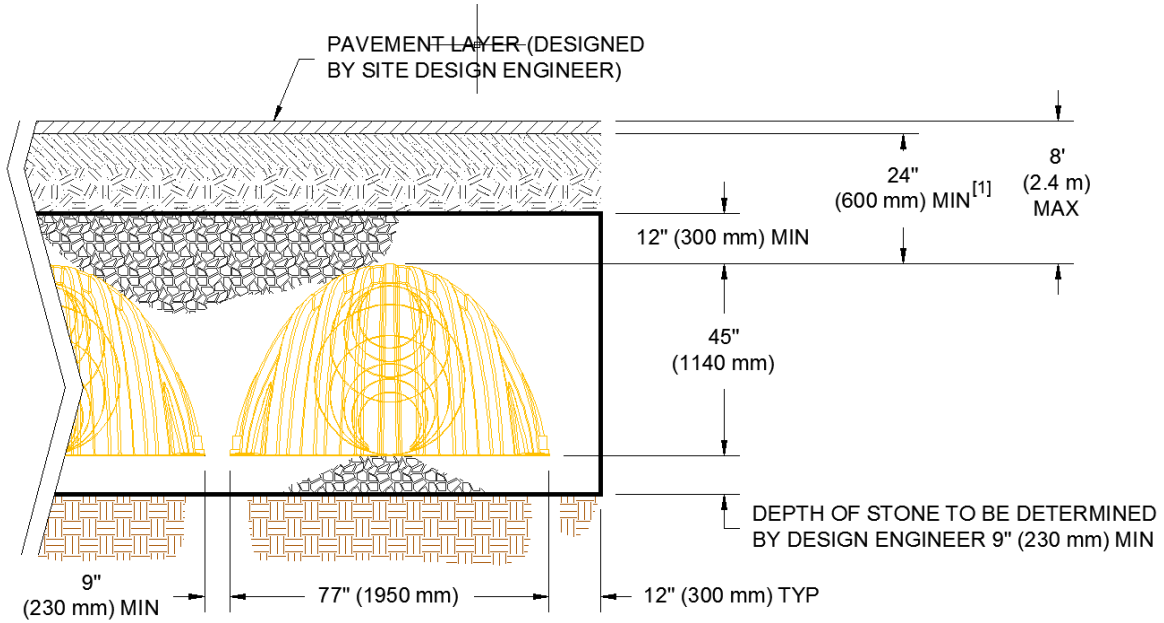
Results

System Volume and Bed Size

Installed Storage Volume	2675 cubic ft.
Storage Volume Per Chamber	178.9 cubic ft.
Storage Volume Per End Cap	46.9 cubic ft.
Number Of Chambers Required	11 each
Number Of End Caps Required	6 each
Rows/Chambers	2 row(s) of 5 chamber(s)
Leftover Rows/Chambers	1 row(s) of 1 chamber(s)
Maximum Length	45.14 ft.
Maximum Width	23.35 ft.
Approx. Bed Size Required	861 square ft.

System Components

Amount Of Stone Required	127 cubic yards
Volume Of Excavation (Not Including Fill)	175 cubic yards
Non-woven Filter Fabric Required	269 square yards
Length Of Isolator Row	39.53 ft.
Woven Isolator Row Fabric	74 square yards



[1] - TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

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KASSAB -DMA A

RIVERSIDE DR, RIVERSIDE

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING..
10. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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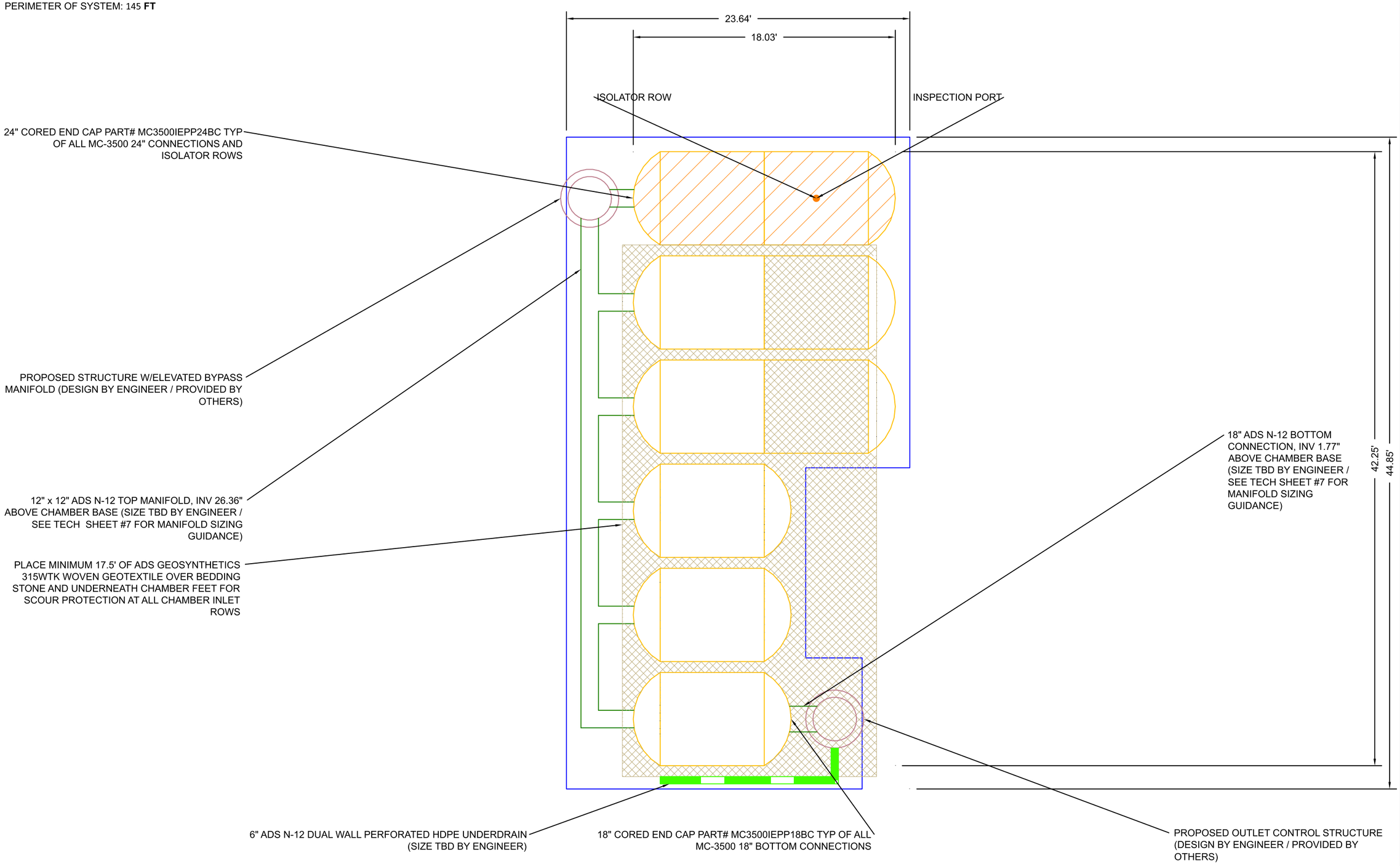
CONCEPTUAL LAYOUT

(9) STORMTECH MC-3500 CHAMBERS
(12) STORMTECH MC-3500 END CAPS
INSTALLED WITH 12 " COVER STONE, 9 " BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 2762 CF
AREA OF SYSTEM: 937 **FT²**
PERIMETER OF SYSTEM: 145 **FT**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



KASSAB -DMA A
RIVERSIDE DR, RIVERSIDE

DATE: 11/07/2018 | DRAWN: RF | CHECKED: ---
PROJECT #: Tool

REV	DRW	CHK	DESCRIPTION

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

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HILLIARD, OH 43026
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NOT TO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH MC-□500 CHAMBER SYSTEMS

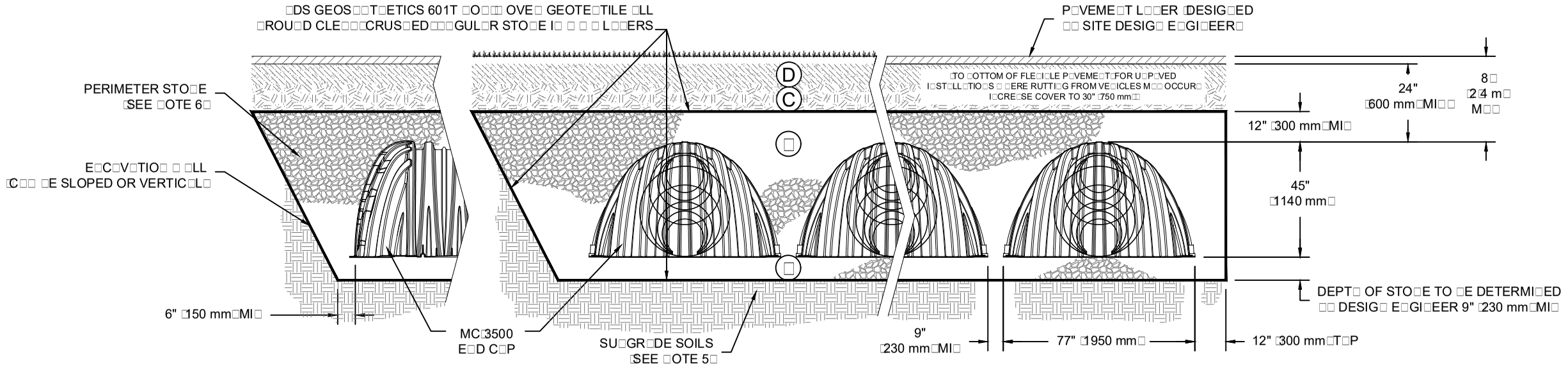
M□TERI□L LOC□TIO□		DESCRIPTIO□	□□S□TO M□TERI□L CL□SSIFIC□TIO□S	COMP□CTIO□ □DE□SIT□ RE□UIREME□T
D	**FINAL FILL:** FILL M□TERI□L FOR L□□ER □D□ST□RTS FROM T□E TOP OF T□E □C□L□□ER TO T□E □OTTOM OF FLE□I□LE P□VEME□T OR U□P□VED FI□IS□ED GR□DE □□OVE□□OTE T□□T P□VEME□T SU□□□SE M□□ □E P□RT OF T□E □D□L□□ER	□□□ SOIL□ROC□ M□TERI□LS□□□TIVE SOILS□OR PER E□GI□EER'S PL□□S□C□EC□ PL□□S FOR P□VEME□T SU□GR□DE RE□UIREME□TS□	□□	PREP□RE PER SITE DESIG□ E□GI□EER'S PL□□S□ P□VED I□ST□LL□TIO□S M□□ □□VE STRI□GE□T M□TERI□L □□D PREP□R□TIO□ RE□UIREME□TS□
C	**INITIAL FILL:** FILL M□TERI□L FOR L□□ER □C□ ST□RTS FROM T□E TOP OF T□E EM□EDME□T STO□E □TO L□□ER□TO 24" □600 mm□□□OVE T□E TOP OF T□E C□□M□ER□□OTE T□□T P□VEME□T SU□□□SE M□□ □E □ P□RT OF T□E □C□L□□ER□	GR□□UL□R □ ELL□GR□DED SOIL□GGREG□TE MI□TURES□□35□ FI□ES OR PROCESSED □GGREG□TE□ MOST P□VEME□T SU□□□SE M□TERI□LS C□□ □E USED I□ LIEU OF T□IS L□□ER□	□□S□TO M145[1] □1□□2□4□□3 OR □□S□TO M43[1] 3□357□4□467□5□56□57□6□67□68□7□78□8□89□ 9□10	□EGI□ COMP□CTIO□S □FTER 24" □600 mm□OF M□TERI□L OVER T□E C□□M□ERS IS RE□C□ED□ COMP□CT □DDITIO□□L L□□ERS I□ 12" □300 mm□ M□□ LIFTS TO □ MI□□95□ PROCTOR DE□SIT□ FOR □ ELL GR□DED M□TERI□L □□D 95□ REL□TIVE DE□SIT□ FOR PROCESSED □GGREG□TE M□TERI□LS□
□	**EMBEDMENT STONE:** FILL SURROU□DI□G T□E C□□M□ERS FROM T□E FOU□D□TIO□ STO□E □TO L□□ER□TO T□E □C□L□□ER □□OVE□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43[1] 3□4	□O COMP□CTIO□ RE□UIRED□
□	**FOUNDATION STONE:** FILL □ELO□ C□□M□ERS FROM T□E SU□GR□DE UP TO T□E FOOT □□OTTOM□ OF T□E C□□M□ER□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43[1] 3□4	PL□TE COMP□CT OR ROLL TO □C□IEVE □ FL□T SURFACE. [2 3]

PLE□SE □OTE□

1□ T□E LISTED □□S□TO DESIG□□TIO□S □RE FOR GR□D□TIO□S O□L□□T□E STO□E MUST □LSO □E CLE□□□CRUS□ED□□□GUL□R□FOR E□□MPLE□□ SPECIFIC□TIO□ FOR □4 STO□E □ OULD ST□TE "CLE□□□CRUS□ED□ □□GUL□R □O□4 □□S□TO M43□STO□E"□

2□ STORMTEC□ COMP□CTIO□ RE□UIREME□TS □RE MET FOR □□LOC□TIO□ M□TERI□LS □ □E□ PL□CED □□D COMP□CTED I□ 9" □230 mm□M□□□LIFTS USI□G T□ O FULL COVER□GES □ IT□ □ VI□R□TOR□ COMP□CTOR□

3□ □ □ERE I□FILTR□TIO□ SURF□CES M□□ □E COMPROMISED □□ COMP□CTIO□□FOR ST□□D□RD DESIG□ LO□D CO□DITIO□S□□ FL□T SURF□CE M□□ □E □C□IEVED □□ R□□I□G OR DR□GGI□G □ IT□OUT COMP□CTIO□ E□UIPME□T□FOR SPECI□L LO□D DESIG□S□CO□T□CT STORMTEC□ FOR COMP□CTIO□ RE□UIREME□TS□



NOTES:

1□ MC□3500 C□□M□ERS S□□LL CO□FORM TO T□E RE□UIREME□TS OF □STM F2418 "ST□□D□RD SPECIFIC□TIO□ FOR POL□PROP□LE□E □PP□CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

2□ MC□3500 C□□M□ERS S□□LL □E DESIG□ED I□ □CCORD□□CE □ IT□ □STM F2787 "ST□□D□RD PR□CTICE FOR STRUCTUR□L DESIG□ OF T□ERMOPL□STIC CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

3□ "□CCEPT□□LE FILL M□TERI□LS" T□□LE □□OVE PROVIDES M□TERI□L LOC□TIO□S□DESCRIPTIO□S□GR□D□TIO□S□□□D COMP□CTIO□ RE□UIREME□TS FOR FOU□D□TIO□□EM□EDME□T□□□D FILL M□TERI□LS□

4□ T□E "SITE DESIG□ E□GI□EER" REFERS TO T□E E□GI□EER RESPO□SI□LE FOR T□E DESIG□ □□D L□□OUT OF T□E STORMTEC□ C□□M□ERS FOR T□IS PROJECT□

5□ T□E SITE DESIG□ E□GI□EER IS RESPO□SI□LE FOR □SSESSI□G T□E □E□RI□G RESIST□□CE □□LLO□ □□LE □E□RI□G C□P□CIT□□OF T□E SU□GR□DE SOILS □□D T□E DEPT□ OF FOU□D□TIO□ STO□E □ IT□ CO□SIDER□TIO□ FOR T□E R□□GE OF E□PECTED SOIL MOISTURE CO□DITIO□S□

6□ PERIMETER STO□E MUST □E E□TE□DED □ORI□O□T□LL□ TO T□E E□C□V□TIO□ □ □LL FOR □OT□ VERTIC□L □□D SLOPED E□C□V□TIO□ □ □LLS□

7□ O□CE L□□ER □C□IS PL□CED□□□□ SOIL□M□TERI□L C□□ □E PL□CED I□ L□□ER □D□UP TO T□E FI□IS□ED GR□DE□MOST P□VEME□T SU□□□SE SOILS C□□ □E USED TO REPL□CE T□E M□TERI□L RE□UIREME□TS OF L□□ER □C□ OR □D□□T T□E SITE DESIG□ E□GI□EER'S DISCRETIO□□

KASSAB -DMA A
RIVERSIDE DR, RIVERSIDE

D□TE□ 11/07/2018 | DR□□ □□ RF | C□EC□ED□ □□□
PROJECT □□Tool

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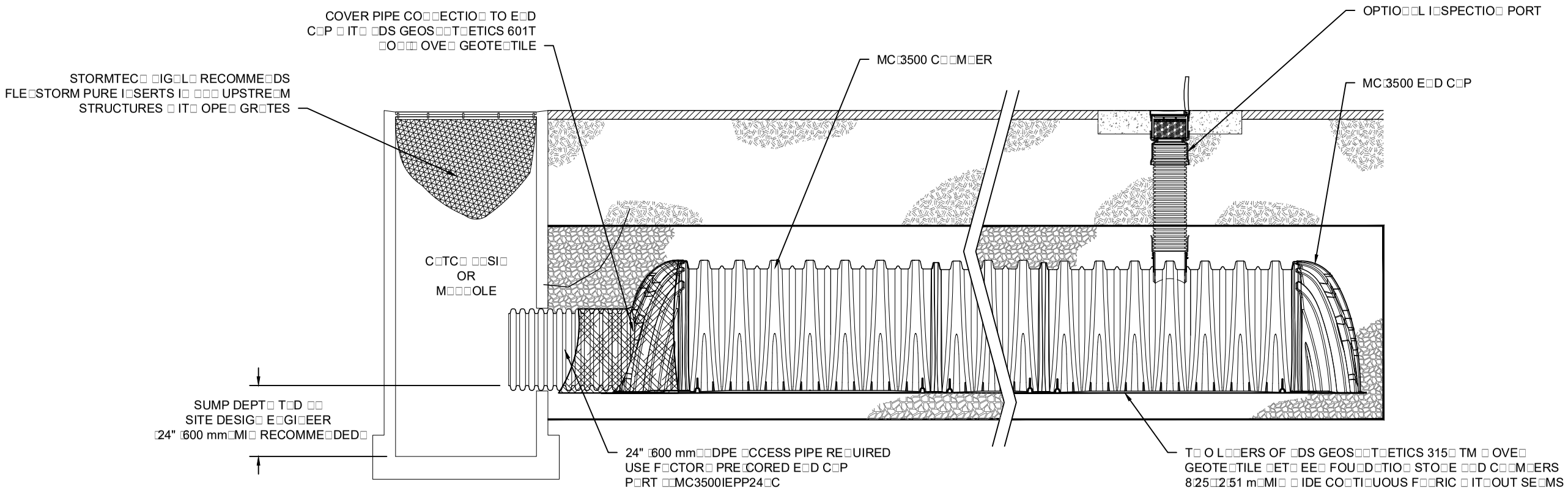
SHEET
3 OF 6



MC-□500 ISOLATOR ROW DETAIL

□TS

INSPECTION & MAINTENANCE

STEP 1□ I□SPECT ISOL□TOR RO□ FOR SEDIME□T
□□ I□SPECTIO□ PORTS □IF PRESE□T□
□□1□ REMOVE□OPE□ LID O□ □□LOPL□ST I□LI□E DR□I□
□□2□ REMOVE □□D CLE□□ FLE□STORM FILTER IF I□ST□LLED
□□3□ USI□G □ FL□S□LIG□T □□D ST□DI□ ROD□ME□SURE DEPT□ OF SEDIME□T □□D RECORD O□ M□I□TE□□□CE LOG
□□4□ LO□ ER □ C□MER□ I□TO ISOL□TOR RO□ FOR VISU□L I□SPECTIO□ OF SEDIME□T LEVELS □OPTIO□□L□
□□5□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□
□□ □LL ISOL□TOR RO□ S
□□1□ REMOVE COVER FROM STRUCTURE □T UPSTRE□M E□D OF ISOL□TOR RO□
□□2□ USI□G □ FL□S□LIG□T□I□SPECT DO□ □ T□E ISOL□TOR RO□ T□ROUG□ OUTLET PIPE
i□ MIRRORS O□ POLES OR C□MER□S M□□ □E USED TO □VOID □ CO□FI□ED SP□CE E□TR□
ii□ FOLLO□ OS□□ REGUL□TIO□S FOR CO□FI□ED SP□CE E□TR□ IF E□TERI□G M□□□OLE
□□3□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□

STEP 2□ CLE□□ OUT ISOL□TOR RO□ USI□G T□E JETV□C PROCESS
□□ □ FI□ED CULVERT CLE□□I□G □O□□LE □ IT□ RE□R F□CI□G SPRE□D OF 45" □1□1 m□OR MORE IS PREFERRED
□□ □PPL□ MULTIPLE P□SSES OF JETV□C U□TIL □□C□FLUS□ □ □TER IS CLE□□
C□ V□CUUM STRUCTURE SUMP □S RE□UIRED

STEP 3□ REPL□CE □LL COVERS□GR□TES□FILTERS□□□D LIDS□RECORD O□SERV□TIO□S □□D □CTIO□S□

STEP 4□ I□SPECT □□D CLE□□ □□SI□S □□D M□□□OLES UPSTRE□M OF T□E STORMTEC□ S□STEM□

NOTES

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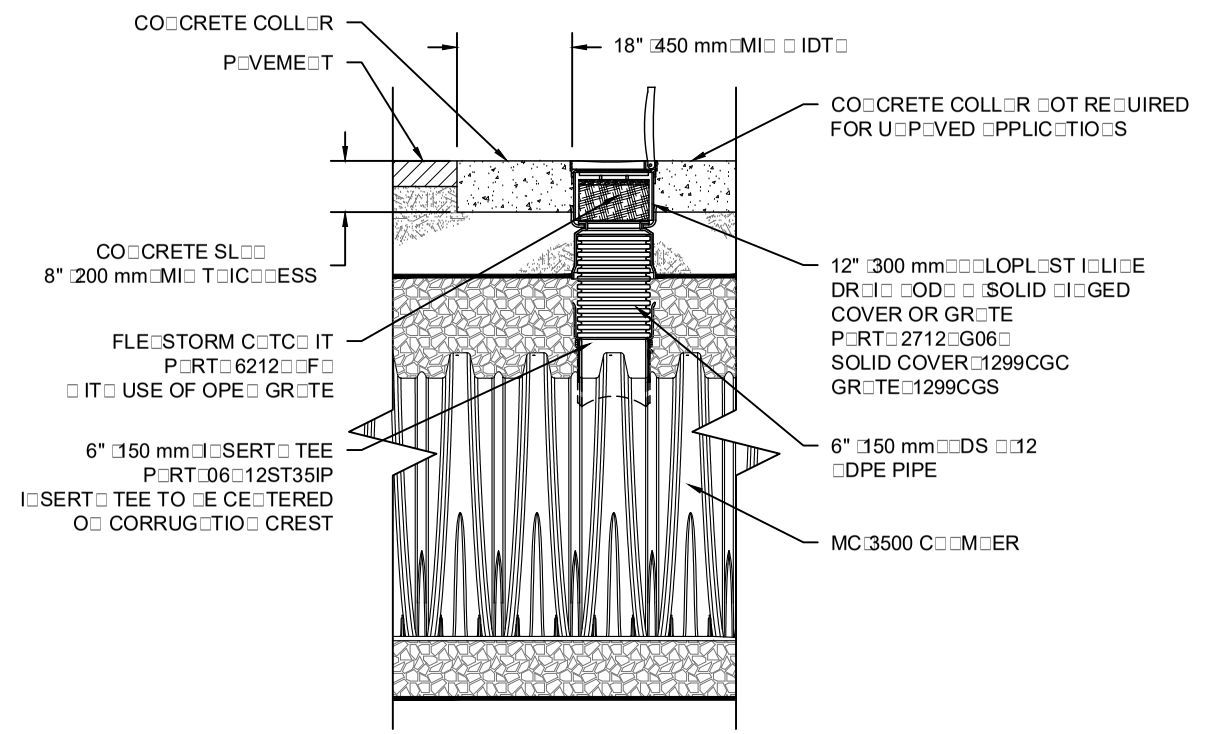
2□ CO□DUCT JETTI□G □□D V□CTORI□G □□□U□LL□ OR □ □E□ I□SPECTIO□ S□O□ S T□□T M□I□TE□□□CE IS □ECESS□R□□



MC-□500 6" INSPECTION PORT DETAIL

□TS

KASSAB -DMA A
RIVERSIDE DR, RIVERSIDE

D□TE□ 11/07/2018 | DR□□ □□ RF
PROJECT □□Tool | C□EC□ED□ □□□

REV	DR□	C□□	DESCRIPTIO□

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SHEET
4 OF 6

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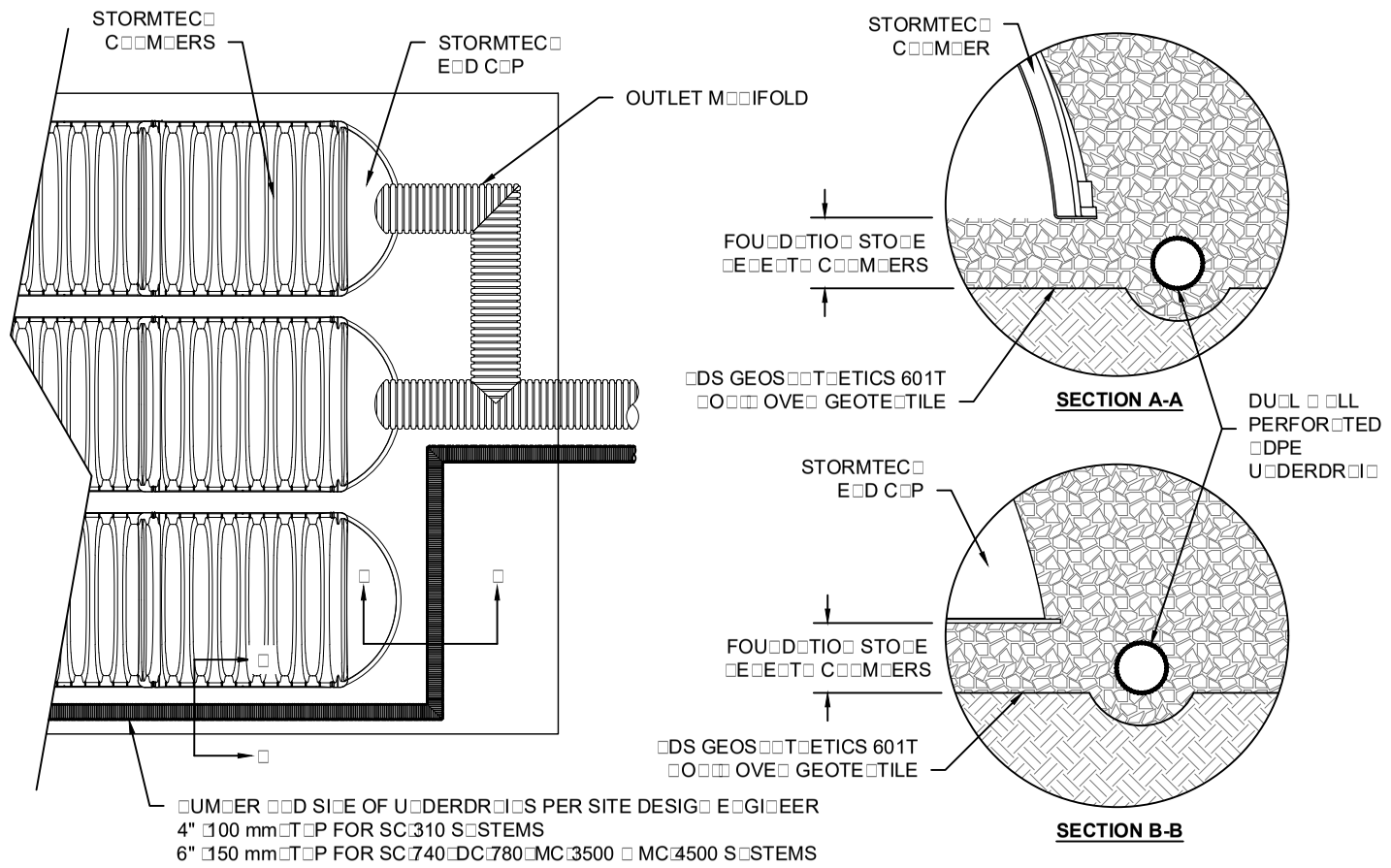

MC-□500 TECHNICAL SPECIFICATION

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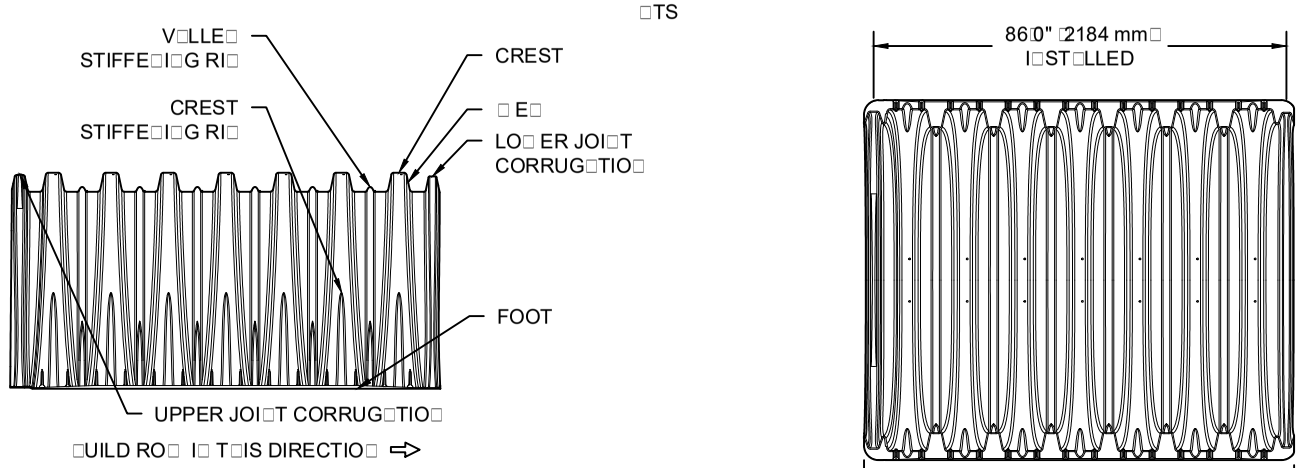

NOMINAL CHAMBER SPECIFICATIONS

SI□E □ □ □ □ I□ST□LLED LE□GT□□	77□0" □ 45□0" □ 86□0"	□1956 mm □ 1143 mm □ 2184 mm□
C□□M□ER STOR□GE	109□9 CU□IC FEET	(3.11 m³)
MI□IMUM I□ST□LLED STOR□GE□	178□9 CU□IC FEET	(5.06 m³)
□ EIG□T	135□0 I□s□	□61□2 □g□

NOMINAL END CAP SPECIFICATIONS

SI□E □ □ □ □ I□ST□LLED LE□GT□□	77□0" □ 45□0" □ 22□5"	□1956 mm □ 1143 mm □ 571 mm□
E□D C□P STOR□GE	14□9 CU□IC FEET	(0.42 m³)
MI□IMUM I□ST□LLED STOR□GE□	46□0 CU□IC FEET	(1.30 m³)
□ EIG□T	50□0 I□s□	□22□7 □g□

□□SSUMES 12" □305 mm□STO□E □□OVE□9" □229 mm□STO□E FOU□D□TIO□ □□D □ET□ EE□ C□□M□ERS□
12" □305 mm□STO□E PERIMETER I□ FRO□T OF E□D C□PS □□D 40□ STO□E POROSIT□

STU□S □T □OTTOM OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "□"
STU□S □T TOP OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "T"

PART #	STUB	B	C
MC3500IEPP06T	6" □150 mm□	33□21" □844 mm□	□□□
MC3500IEPP06□		□□□	0□66" □17 mm□
MC3500IEPP08T	8" □200 mm□	31□16" □791 mm□	□□□
MC3500IEPP08□		□□□	0□81" □21 mm□
MC3500IEPP10T	10" □250 mm□	29□04" □738 mm□	□□□
MC3500IEPP10□		□□□	0□93" □24 mm□
MC3500IEPP12T	12" □300 mm□	26□36" □670 mm□	□□□
MC3500IEPP12□		□□□	1□35" □34 mm□
MC3500IEPP15T	15" □375 mm□	23□39" □594 mm□	□□□
MC3500IEPP15□		□□□	1□50" □38 mm□
MC3500IEPP18TC	18" □450 mm□	20□03" □509 mm□	□□□
MC3500IEPP18□C		□□□	1□77" □45 mm□
MC3500IEPP24TC	24" □600 mm□	14□48" □368 mm□	□□□
MC3500IEPP24□C		□□□	2□06" □52 mm□
MC3500IEPP30□C	30" □750 mm□	□□□	

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CUSTOM PRECORED I□VERTS □RE □V□IL□□LE UPO□ RE□UEST□I□VE□TORIED M□□IFOLDS I□CLUDE 12□24" □300□600 mm□SI□E O□ SI□E □□D 15□48" □375□1200 mm□ECCE□TRIC M□□IFOLDS□
CUSTOM I□VERT LOC□TIO□S O□ T□E MC□3500 E□D C□P CUT I□ T□E FIELD □RE □OT RECOMME□DED FOR PIPE SI□ES GRE□TER T□□□ 10" □250 mm□
T□E I□VERT LOC□TIO□ I□ COLUM□ □□□RE T□E □IG□TEST POSSI□LE FOR T□E PIPE SI□E□

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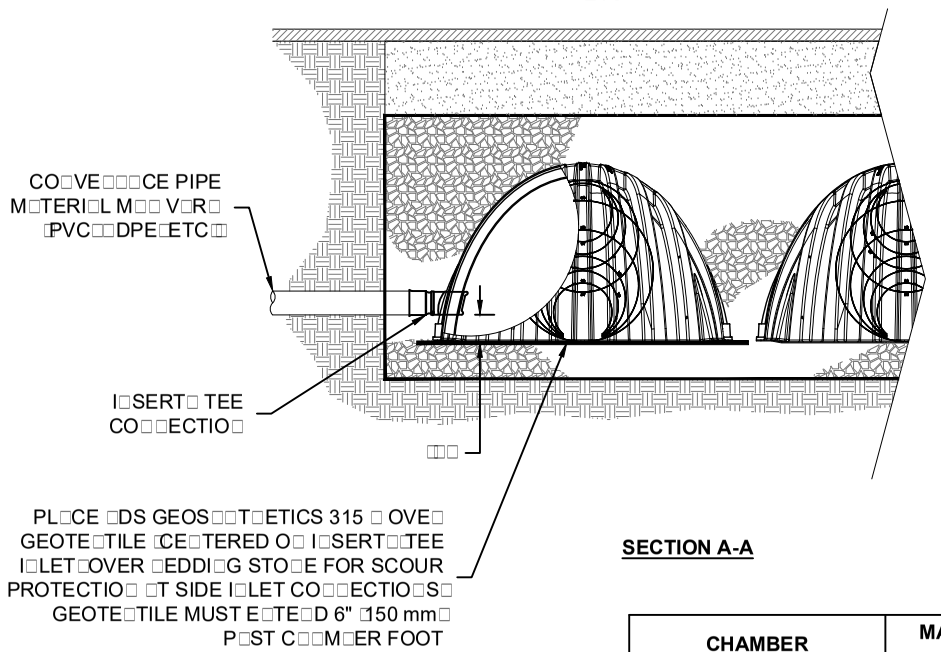
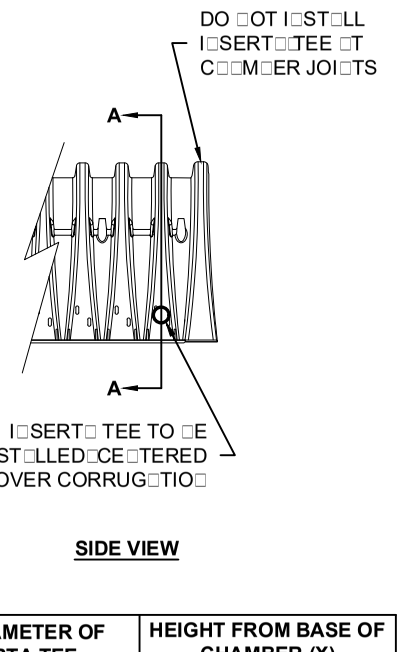


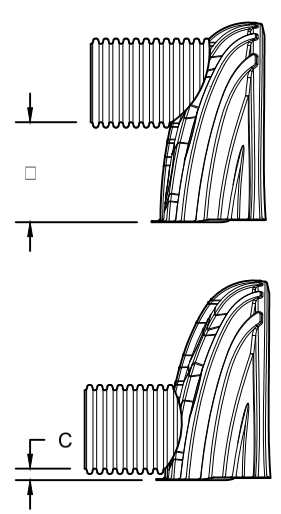
SECTION A-A



SIDE VIEW

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC□310	6" □150 mm□	4" □100 mm□
SC□740	10" □250 mm□	4" □100 mm□
DC□780	10" □250 mm□	4" □100 mm□
MC□3500	12" □300 mm□	6" □150 mm□
MC□4500	12" □300 mm□	8" □200 mm□
I□SERT□ TEE FITTI□GS □V□IL□□LE FOR SDR 26□SDR 35□SC□ 40 IPS G□S□ETED □ SOLVE□T □ ELD□□12□□P STORM□C□900 OR DUCTILE IRO□		

NOTE:
P□RT □UM□ERS □ ILL V□R□ □□SED O□ I□LET PIPE M□TERI□LS□ CO□T□CT STORMTEC□ FOR MORE I□FORM□TIO□□



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PROJECT □□Tool

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SHEET
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MC-SERIES END CAP INSERTION DETAIL

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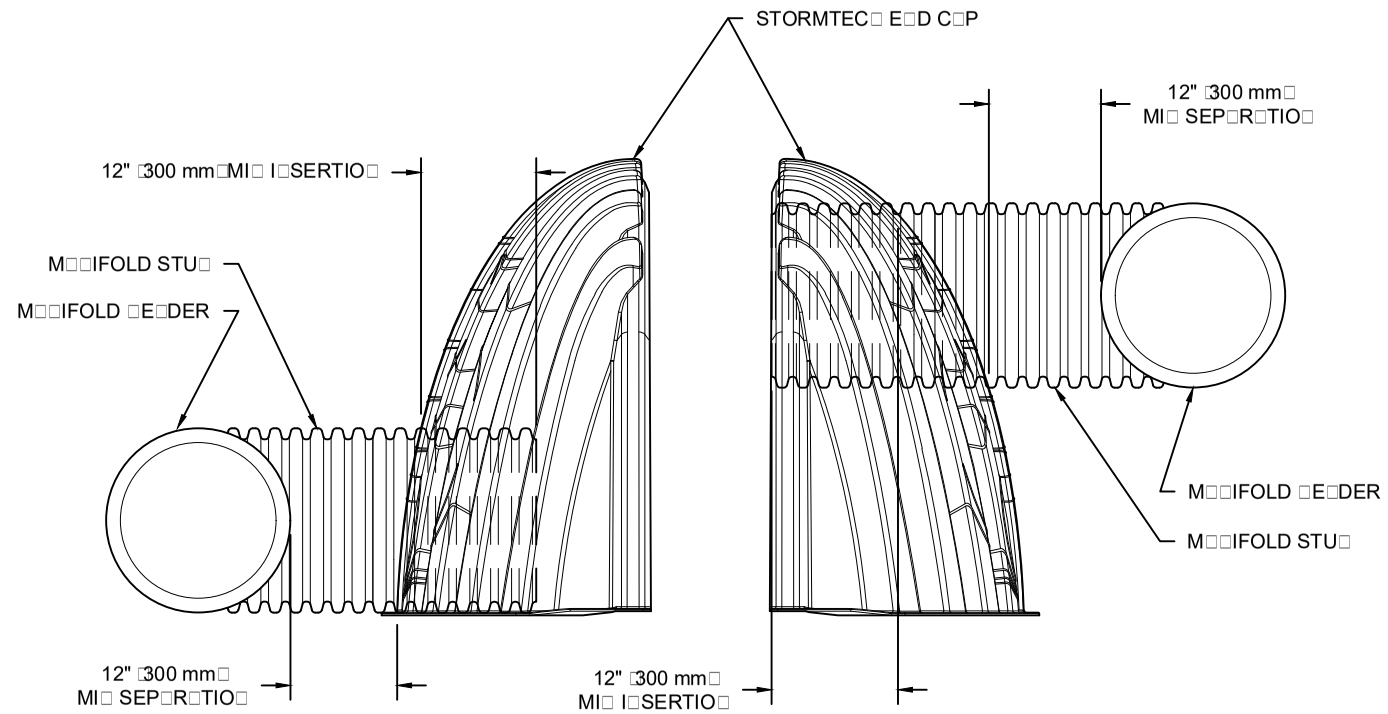

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RESPO□SI□ILIT□ OF T□E SITE DESIG□ E□GI□EER TO E□SURE T□□T T□E PRODUCT□S□DEPICTED □□D □LL □SSOCI□TED DET□ILS MEET □LL □PPLIC□□LE L□□ S□REGUL□TIO□S□□□D PROJECT RE□UIREME□TS□

User Inputs

Chamber Model	MC-3500
Outlet Control Structure	Yes (Outlet)
Project Name	KASSAB -DMA D TO H
Project Location	RIVERSIDE DR, RIVERSIDE
Project Date	11/07/2018
Engineer	RRF
Measurement Type	Imperial
Required Storage Volume	5600 cubic ft.
Stone Porosity	40%
Stone Above Chambers	12 in.
Stone Foundation Depth	9 in.
Average Cover Over Chambers	24 in.
Design Constraint	Length
Design Constraint Dimension	50 ft.

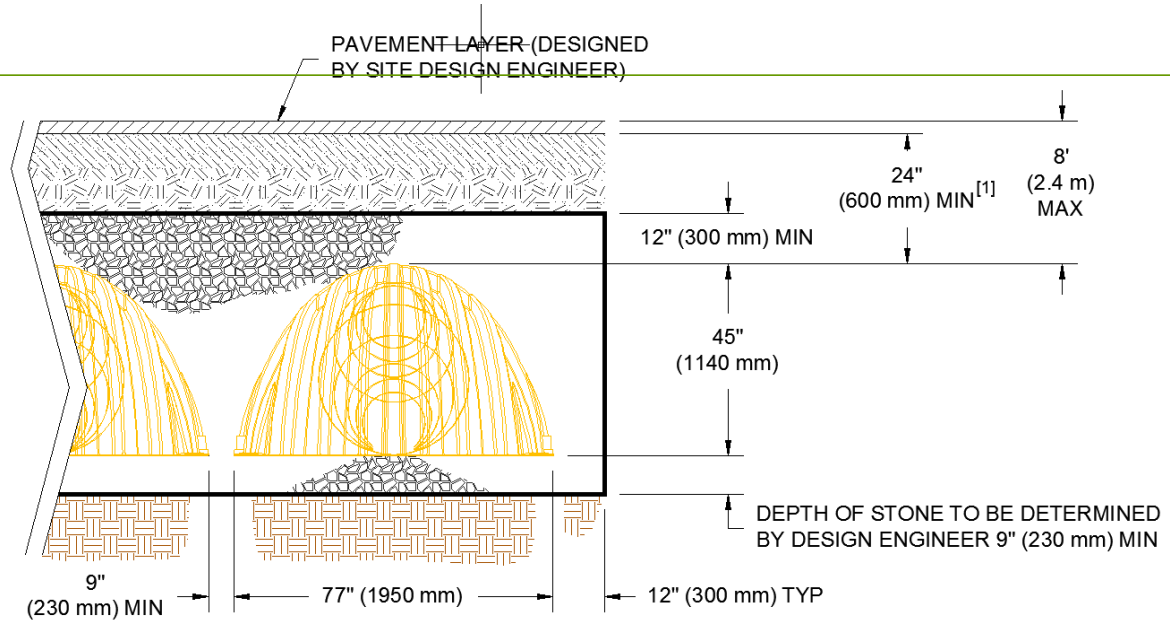
Results

System Volume and Bed Size

Installed Storage Volume	5853 cubic ft.
Storage Volume Per Chamber	178.9 cubic ft.
Storage Volume Per End Cap	46.9 cubic ft.
Number Of Chambers Required	26 each
Number Of End Caps Required	12 each
Rows/Chambers	5 row(s) of 5 chamber(s)
Leftover Rows/Chambers	1 row(s) of 1 chamber(s)
Maximum Length	45.14 ft.
Maximum Width	44.85 ft.
Approx. Bed Size Required	1832 square ft.

System Components

Amount Of Stone Required	261 cubic yards
Volume Of Excavation (Not Including Fill)	373 cubic yards
Non-woven Filter Fabric Required	511 square yards
Length Of Isolator Row	39.53 ft.
Woven Isolator Row Fabric	74 square yards



[1] - TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

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KASSAB -DMA DTO H

RIVERSIDE DR, RIVERSIDE

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

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IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTITIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

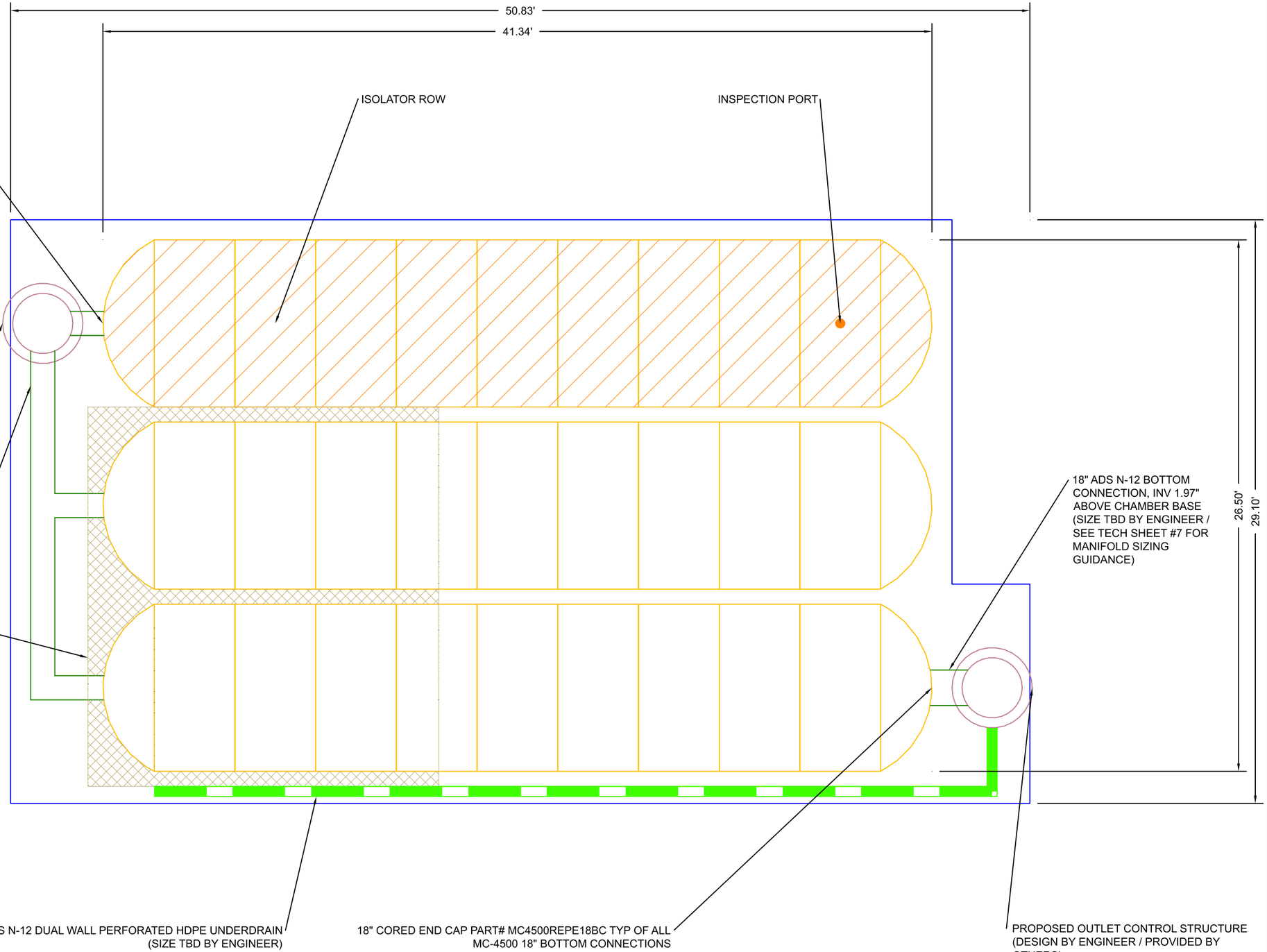
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

(27) STORMTECH MC-4500 CHAMBERS
(6) STORMTECH MC-4500 END CAPS
INSTALLED WITH 12 " COVER STONE, 9 " BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 5657 CF
AREA OF SYSTEM: 1409 **FT²**
PERIMETER OF SYSTEM: 160 **FT**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



KASSAB -DMA DTO H
RIVERSIDE DR, RIVERSIDE

DATE: 11/07/2018 | DRAWN: RF | CHECKED: ---
PROJECT #: Tool

REV	DRW	CHK	DESCRIPTION

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NOT TO SCALE

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

M□TERI□L LOC□TIO□		DESCRIPTIO□	□□S□TO M□TERI□L CL□SSIFIC□TIO□S	COMP□CTIO□ □DE□SIT□ RE□UIREME□T
D	**FINAL FILL:** FILL M□TERI□L FOR L□□ER □D□ST□RTS FROM T□E TOP OF T□E □C□L□□ER TO T□E □OTTOM OF FLE□I□LE P□VEME□T OR U□P□VED FI□IS□ED GR□DE □□OVE□□OTE T□□T P□VEME□T SU□□□SE M□□ □E P□RT OF T□E □D□L□□ER	□□□ SOIL□ROC□ M□TERI□LS□□□TIVE SOILS□OR PER E□GI□EER'S PL□□S□C□EC□ PL□□S FOR P□VEME□T SU□GR□DE RE□UIREME□TS□	□□	PREP□RE PER SITE DESIG□ E□GI□EER'S PL□□S□ P□VED I□ST□LL□TIO□S M□□ □□VE STRI□GE□T M□TERI□L □□D PREP□R□TIO□ RE□UIREME□TS□
C	**INITIAL FILL:** FILL M□TERI□L FOR L□□ER □C□ ST□RTS FROM T□E TOP OF T□E EM□EDME□T STO□E □□L□□ER□TO 24" □600 mm□□□OVE T□E TOP OF T□E C□□M□ER□□OTE T□□T P□VEME□T SU□□□SE M□□ □E □ P□RT OF T□E □C□L□□ER□	GR□□UL□R □ ELL□GR□DED SOIL□□GGREG□TE MI□TURES□□35□ FI□ES OR PROCESSED □GGREG□TE□ MOST P□VEME□T SU□□□SE M□TERI□LS C□□ □E USED I□ LIEU OF T□IS L□□ER□	□□S□TO M145¹ □1□□2□4□□3 OR □□S□TO M43¹ 3□357□4□467□5□56□57□6□67□68□7□78□8□89□ 9□10	□EGI□ COMP□CTIO□S □FTER 24" □600 mm□OF M□TERI□L OVER T□E C□□M□ERS IS RE□C□ED□ COMP□CT □DDITIO□□L L□□ERS I□ 12" □300 mm□ M□□ LIFTS TO □ MI□□95□ PROCTOR DE□SIT□ FOR □ ELL GR□DED M□TERI□L □□D 95□ REL□TIVE DE□SIT□ FOR PROCESSED □GGREG□TE M□TERI□LS□
□	**EMBEDMENT STONE:** FILL SURROU□DI□G T□E C□□M□ERS FROM T□E FOU□D□TIO□ STO□E □□□ L□□ER□TO T□E □C□L□□ER □□OVE□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43¹ 3□4	□O COMP□CTIO□ RE□UIRED□
□	**FOUNDATION STONE:** FILL □ELO□ C□□M□ERS FROM T□E SU□GR□DE UP TO T□E FOOT □□OTTOM□ OF T□E C□□M□ER□	CLE□□□CRUS□ED□□□GUL□R STO□E□□OMI□□L SI□E DISTRI□UTIO□ □ET□ EE□ 3□4□2 I□C□ □20□50 mm□	□□S□TO M43¹ 3□4	PL□TE COMP□CT OR ROLL TO □C□IEVE □ FL□T SURFACE. ²³

PLE□SE □OTE□

1□ T□E LISTED □□S□TO DESIG□□TIO□S □RE FOR GR□D□TIO□S O□L□□T□E STO□E MUST □LSO □E CLE□□□CRUS□ED□□□GUL□R□FOR E□□MPLE□□ SPECIFIC□TIO□ FOR □4 STO□E □ OULD ST□TE"CLE□□□CRUS□ED□ □□GUL□R □O□4 □□S□TO M43□STO□E"□

2□ STORMTEC□ COMP□CTIO□ RE□UIREME□TS □RE MET FOR □□LOC□TIO□ M□TERI□LS □ □E□ PL□CED □□D COMP□CTED I□ 9" □230 mm□M□□□LIFTS USI□G T□ O FULL COVER□GES □ IT□ □ VI□R□TOR□ COMP□CTOR□

3□ □ □ERE I□FILTR□TIO□ SURF□CES M□□ □E COMPROMISED □□ COMP□CTIO□□FOR ST□□D□RD DESIG□ LO□D CO□DITIO□S□□ FL□T SURF□CE M□□ □E □C□IEVED □□ R□□I□G OR DR□GGI□G □ IT□OUT COMP□CTIO□ E□UIPME□T□FOR SPECI□L LO□D DESIG□S□CO□T□CT STORMTEC□ FOR COMP□CTIO□ RE□UIREME□TS□

NOTES:

1□ MC□4500 C□□M□ERS S□□LL CO□FORM TO T□E RE□UIREME□TS OF □STM F2418 "ST□□D□RD SPECIFIC□TIO□ FOR POL□PROP□LE□E □PP□CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

2□ MC□4500 C□□M□ERS S□□LL □E DESIG□ED I□ □CCORD□□CE □ IT□ □STM F2787 "ST□□D□RD PR□CTICE FOR STRUCTUR□L DESIG□ OF T□ERMOPL□STIC CORRUG□TED □ □LL STORM□ □TER COLLECTIO□ C□□M□ERS"□

3□ "□CCEPT□□LE FILL M□TERI□LS" T□□LE □□OVE PROVIDES M□TERI□L LOC□TIO□S□DESCRIPTIO□S□GR□D□TIO□S□□□D COMP□CTIO□ RE□UIREME□TS FOR FOU□D□TIO□□EM□EDME□T□□□D FILL M□TERI□LS□

4□ T□E "SITE DESIG□ E□GI□EER" REFERS TO T□E E□GI□EER RESPO□SI□LE FOR T□E DESIG□ □□D L□□OUT OF T□E STORMTEC□ C□□M□ERS FOR T□IS PROJECT□

5□ T□E SITE DESIG□ E□GI□EER IS RESPO□SI□LE FOR □SSESSI□G T□E □E□RI□G RESIST□□CE □□LLO□ □□LE □E□RI□G C□P□CIT□□OF T□E SU□GR□DE SOILS □□D T□E DEPT□ OF FOU□D□TIO□ STO□E □ IT□ CO□SIDER□TIO□ FOR T□E R□□GE OF E□PECTED SOIL MOISTURE CO□DITIO□S□

6□ PERIMETER STO□E MUST □E E□TE□DED □ORI□O□T□LL□ TO T□E E□C□V□TIO□ □ □LL FOR □OT□ VERTIC□L □□D SLOPED E□C□V□TIO□ □ □LLS□

7□ O□CE L□□ER □C□IS PL□CED□□□□ SOIL□M□TERI□L C□□ □E PL□CED I□ L□□ER □D□UP TO T□E FI□IS□ED GR□DE□MOST P□VEME□T SU□□□SE SOILS C□□ □E USED TO REPL□CE T□E M□TERI□L RE□UIREME□TS OF L□□ER □C□ OR □D□□T T□E SITE DESIG□ E□GI□EER'S DISCRETIO□□

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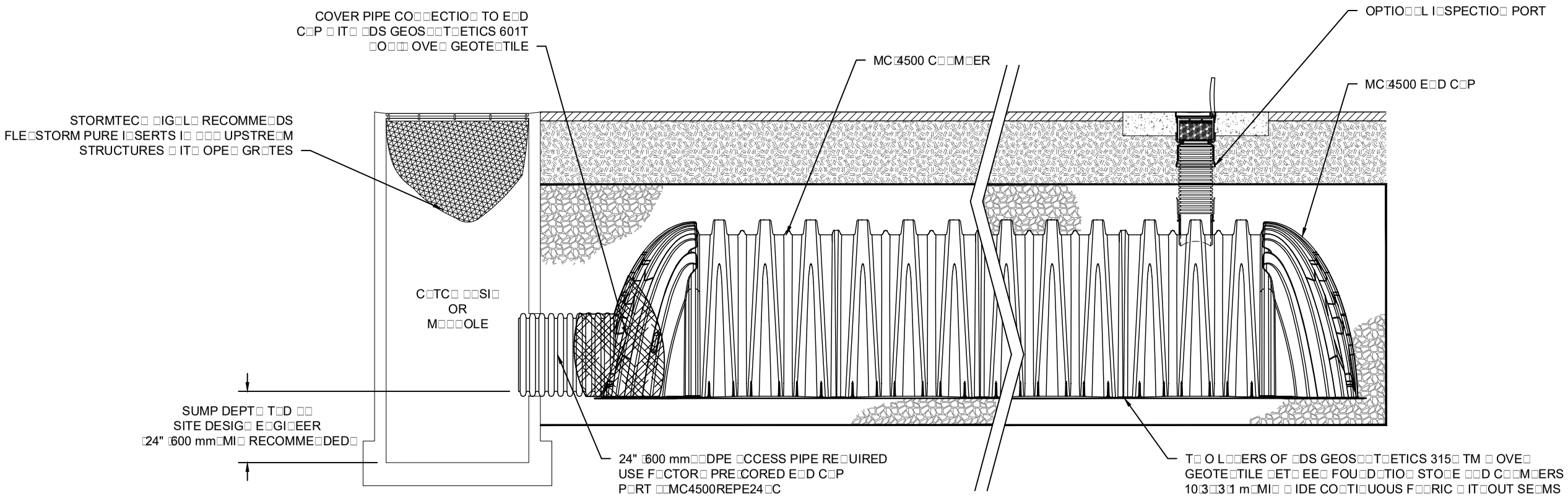
4640 TRUEM□□ □LVD
□ILLI□RD□O□ 43026
1□800.733.7473

R OT□ER PROJECT REPRESE□T□TIVE□T□E SITE DESIG□ E□GI□EER S□□LL REVIE□ T□IS DR□□□G PRIOR TO CO□STRUCTIO□□IT IS T□E ULTIM□TE RESPO□SI□ILIT□ OF T□E SITE DESIG□ E□GI□EER TO E□SURE T□□T T□E PRODUCT S□ DEPICTED □□D □LL □SSOCI□TED DET□ILS MEET □LL □PPLIC□□LE L□□S REGUL□TIO□S□□□D PROJECT RE□UIREME□TS□

T□IS DR□□ I□G □□□S □EE□ PREP□RED □□SED O□ I□FORM□TIO□ PROVIDED TO □DS U□DER T□E DIRECTIO□ OF T□E SITE DESIG□ E□GI□EER OR OT□ER PR



MC-4500 ISOLATOR ROW DETAIL
□TS

INSPECTION & MAINTENANCE

STEP 1□ I□SPECT ISOL□TOR RO□ FOR SEDIME□T
□□ I□SPECTIO□ PORTS □IF PRESE□T□
□□1□ REMOVE□OPE□ LID O□ □□LOPL□ST I□LI□E DR□I□
□□2□ REMOVE □□D CLE□□ FLE□STORM FILTER IF I□ST□LLED
□□3□ USI□G □ FL□S□LIG□T □□D ST□DI□ ROD□ME□SURE DEPT□ OF SEDIME□T □□D RECORD O□ M□I□TE□□□CE LOG
□□4□ LO□ ER □ C□MER□ I□TO ISOL□TOR RO□ FOR VISU□L I□SPECTIO□ OF SEDIME□T LEVELS □OPTIO□□L□
□□5□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□
□□ □LL ISOL□TOR RO□ S
□□1□ REMOVE COVER FROM STRUCTURE □T UPSTRE□M E□D OF ISOL□TOR RO□
□□2□ USI□G □ FL□S□LIG□T□I□SPECT DO□ □ T□E ISOL□TOR RO□ T□ROUG□ OUTLET PIPE
i□ MIRRORS O□ POLES OR C□MER□S M□□ □E USED TO □VOID □ CO□FI□ED SP□CE E□TR□
ii□ FOLLO□ OS□□ REGUL□TIO□S FOR CO□FI□ED SP□CE E□TR□ IF E□TERI□G M□□□OLE
□□3□ IF SEDIME□T IS □T□OR □□OVE□3" □80 mm□PROCEED TO STEP 2□IF □OT□PROCEED TO STEP 3□

STEP 2□ CLE□□ OUT ISOL□TOR RO□ USI□G T□E JETV□C PROCESS
□□ □ FI□ED CULVERT CLE□□I□G □O□□LE □ IT□ RE□R F□CI□G SPRE□D OF 45" □11 m□OR MORE IS PREFERRED
□□ □PPL□ MULTIPLE P□SSES OF JETV□C U□TIL □□C□FLUS□ □ □TER IS CLE□□
C□ V□CUUM STRUCTURE SUMP □S RE□UIRED

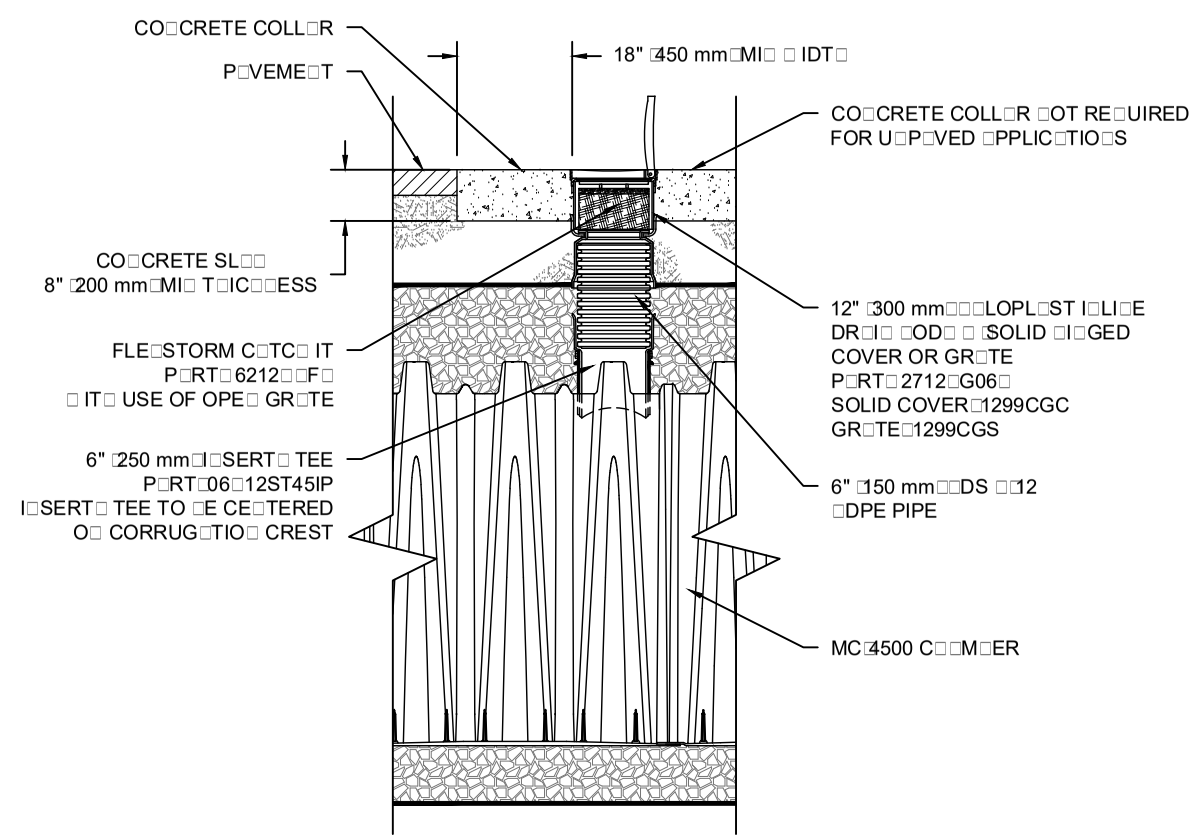
STEP 3□ REPL□CE □LL COVERS□GR□TES□FILTERS□□□D LIDS□RECORD O□SERV□TIO□S □□D □CTIO□S□

STEP 4□ I□SPECT □□D CLE□□ □□SI□S □□D M□□□OLES UPSTRE□M OF T□E STORMTEC□ S□STEM□

NOTES

1□ I□SPECT EVER□ 6 MO□T□S DURI□G T□E FIRST □E□R OF OPER□TIO□□□DJUST T□E I□SPECTIO□ I□TERV□L □□SED O□ PREVIOUS O□SERV□TIO□S OF SEDIME□T □CCUMUL□TIO□ □□D □IG□ □ □TER ELEV□TIO□S□

2□ CO□DUCT JETTI□G □□D V□CTORI□G □□□U□LL□ OR □ □E□ I□SPECTIO□ S□O□ S T□□T M□I□TE□□□CE IS □ECESS□R□□



MC-4500 6" INSPECTION PORT DETAIL
□TS

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PROJECT □□Tool | C□EC□ED□ □□□

REV	DR□	C□□	DESCRIPTIO□

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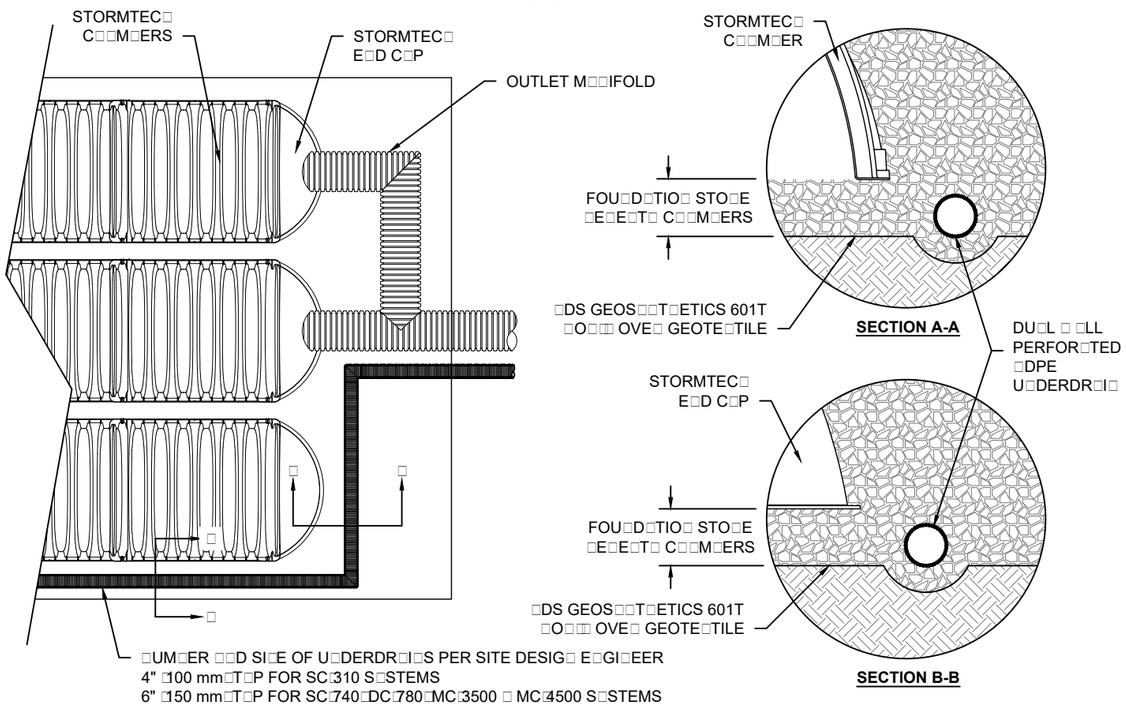
DV□□CED DR□□GE S□STEMS □.C□.

T□IS DR□□ I□G □□□S □EE□ PREP□RED □□SED O□ I□FORM□TIO□ PROVIDED TO □DS U□DER T□E DIRECTIO□ OF T□E SITE DESIG□ E□GI□EER RESPO□SI□ILIT□ OF T□E SITE DESIG□ E□GI□EER TO E□SURE T□□T T□E PRODUCT S□ DEPICTED □□D □LL □SSOCI□TED DET□ILS MEET □LL □PPLIC□□LE □□□S REGUL□TIO□S. CONTRACTOR SHALL REVIE□ T□IS DR□□I□G PRIOR TO CO□STRUCTIO□ AND NOTIFY THE E□GI□EER OF ANY DISCREPANCIES BEFORE PROCEEDING □ITH CONSTRUCTION. □□ IT IS T□E ULTIM□TE

SHEET
4 OF 6

UNDERDRAIN DETAIL

□TS



MC-4500 TECHNICAL SPECIFICATION

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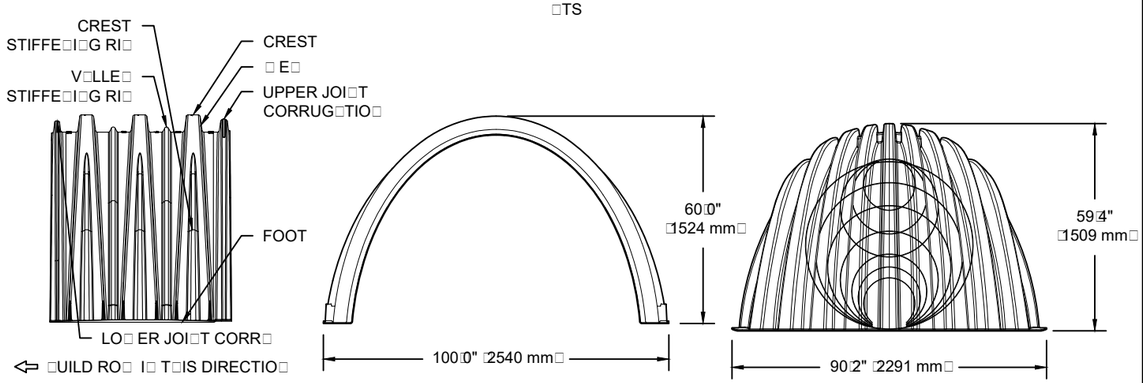


NOMINAL CHAMBER SPECIFICATIONS

SI□E □□ □ □ □ I□ST□LLED LE□GT□□	100□0" □ 60□0" □ 48□3"	□2540 mm □ 1524 mm □ 1227 mm□
C□□M□ER STOR□GE	106□5 CU□IC FEET	(3.01 m³)
MI□IMUM I□ST□LLED STOR□GE□	162□6 CU□IC FEET	(4.60 m³)
□ EIG□T	130□0 I□s□	□59□0 □g□

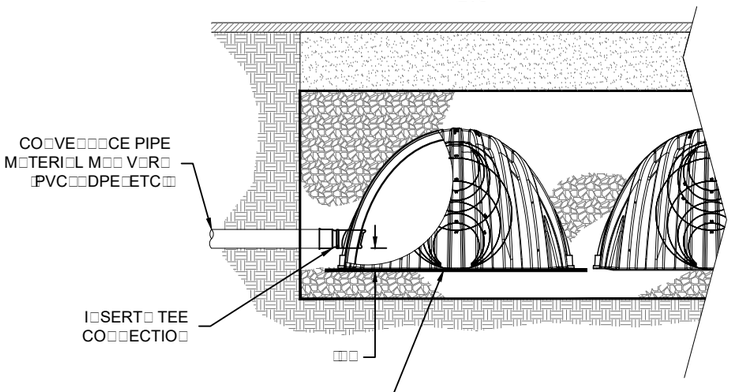
NOMINAL END CAP SPECIFICATIONS

SI□E □□ □ □ □ I□ST□LLED LE□GT□□	90□2" □ 59□4" □ 30□7"	□2291 mm □ 1509 mm □ 781 mm□
E□D C□P STOR□GE	35□7 CU□IC FEET	(1.01 m³)
MI□IMUM I□ST□LLED STOR□GE□	108□7 CU□IC FEET	(3.08 m³)
□ EIG□T	135□0 I□s□	□61□2 □g□

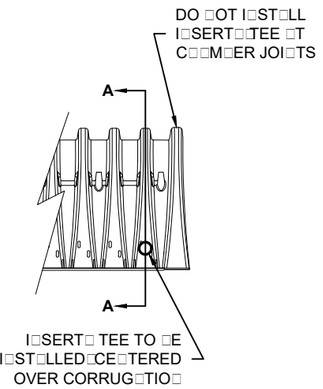
□□SSUMES 12" □305 mm□STO□E □□OVE□9" □229 mm□STO□E FOU□D□TIO□ □□D □ET□ EE□ C□□M□ERS□
12" □305 mm□STO□E PERIMETER I□ FRO□T OF E□D C□PS □□D 40□ STO□E POROSIT□□

INSERTA TEE DETAIL

□TS



SECTION A-A



SIDE VIEW

NOTE:
P□RT □UM□ERS □ ILL V□R□ □□SED O□ I□LET PIPE M□TERI□LS□
CO□T□CT STORMTEC□ FOR MORE I□FORM□TIO□□

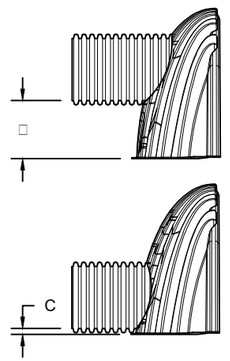
CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC□310	6" □150 mm□	4" □100 mm□
SC□740	10" □250 mm□	4" □100 mm□
DC□780	10" □250 mm□	4" □100 mm□
MC□3500	12" □300 mm□	6" □150 mm□
MC□4500	12" □300 mm□	8" □200 mm□
I□SERT□ TEE FITTI□GS □V□IL□□LE FOR SDR 26□SDR 35□SC□ 40 IPS G□S□ETED □ SOLVE□T □ ELD□□12□□P STORM□C□900 OR DUCTILE IRO□		

STU□S □T □OTTOM OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "□"
STU□S □T TOP OF E□D C□P FOR P□RT □UM□ERS E□DI□G □ IT□ "T"

PART #	STUB	B	C
MC4500REPE06T	6" □150 mm□	42□54" □1□081 m□	□□□
MC4500REPE06□		□□□	0□86" □22 mm□
MC4500REPE08T	8" □200 mm□	40□50" □1□029 m□	□□□
MC4500REPE08□		□□□	1□01" □26 mm□
MC4500REPE10T	10" □250 mm□	38□37" □975 mm□	□□□
MC4500REPE10□		□□□	1□33" □34 mm□
MC4500REPE12T	12" □300 mm□	35□69" □907 mm□	□□□
MC4500REPE12□		□□□	1□55" □39 mm□
MC4500REPE15T	15" □375 mm□	32□72" □831 mm□	□□□
MC4500REPE15□		□□□	1□70" □43 mm□
MC4500REPE18TC	18" □450 mm□	29□36" □746 mm□	□□□
MC4500REPE18□C		□□□	1□97" □50 mm□
MC4500REPE24TC	24" □600 mm□	23□05" □585 mm□	□□□
MC4500REPE24□C		□□□	2□26" □57 mm□
MC4500REPE30□C	30" □750 mm□	□□□	2□95" □75 mm□
MC4500REPE36□C	36" □900 mm□	□□□	3□25" □83 mm□
MC4500REPE42□C	42" □1050 mm□	□□□	3□55" □90 mm□

□OTE□□LL DIME□SIO□S □RE □OMI□□L

CUSTOM PRECORED I□VERTS □RE □V□IL□□LE UPO□ RE□UEST□I□VE□TORIED M□□IFOLDS I□CLUDE 12□24" □300□600 mm□SI□E O□ SI□E □□D 15□48" □375□1200 mm□ECCE□TRIC M□□IFOLDS□
CUSTOM I□VERT LOC□TIO□S O□ T□E MC□4500 E□D C□P CUT I□ T□E FIELD □RE □OT RECOMME□DED FOR PIPE SI□ES GRE□TER T□□□ 10" □250 mm□
T□E I□VERT LOC□TIO□ I□ COLUM□ □□□RE T□E □IG□TEST POSSI□LE FOR T□E PIPE SI□E□



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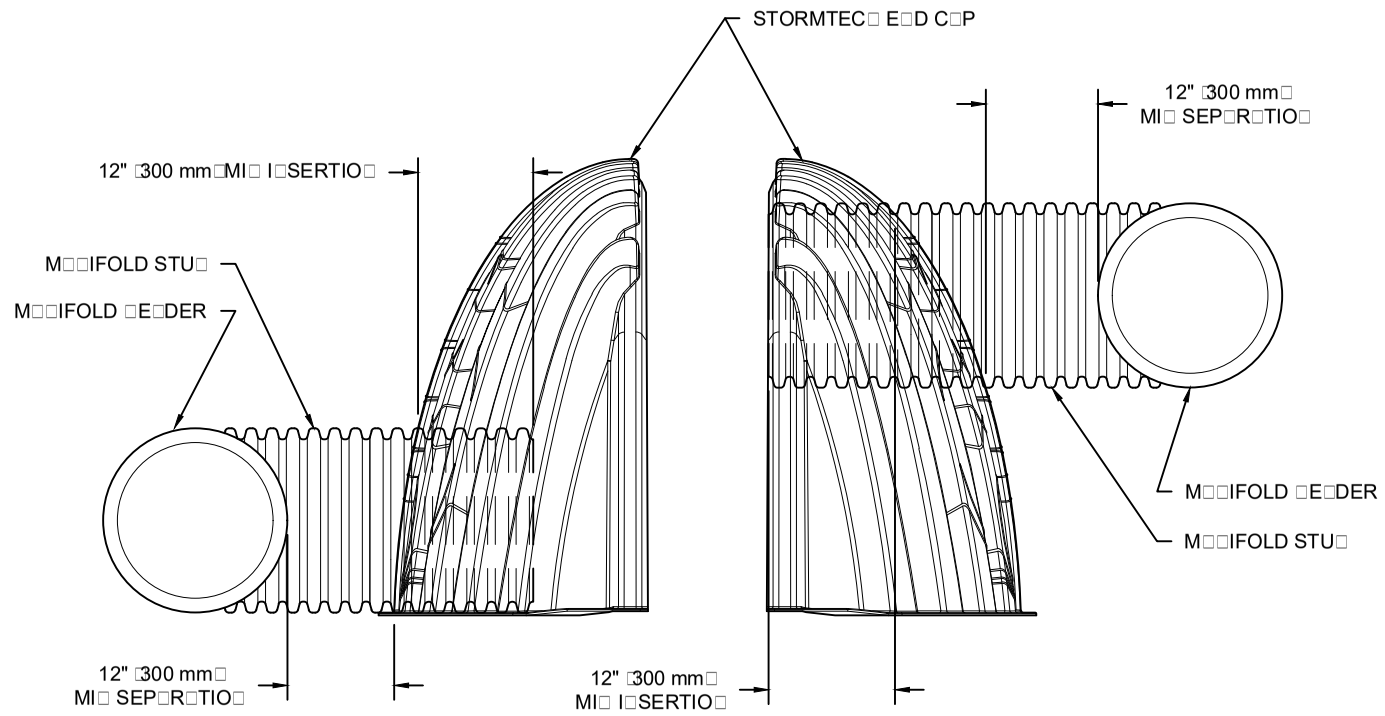

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Appendix 8 Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	**... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE**		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☐ **A. On-site storm drain inlets**	☐ Locations of inlets.	☐ Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	☐ Maintain and periodically repaint or replace inlet markings. ☐ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ☐ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ☐ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
☐ **B. Interior floor drains and elevator shaft sump pumps**		☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ **C. Interior parking garages**		☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **D1.** Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	☐ Provide Integrated Pest Management information to owners, lessees, and operators.
☐ **D2.** Landscape/ Outdoor Pesticide Use	☐ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☐ Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)	State that final landscape plans will accomplish all of the following. ☐ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ☐ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated ☐ soil conditions. Consider using pest-resistant ☐ plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	☐ Maintain landscaping using minimum or no pesticides. ☐ See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/Error! Hyperlink reference not valid. Provide IPM information to new ☐ owners, lessees and operators.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **E.** Pools, spas, ponds, decorative fountains, and other water features.	☐ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☐ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ **F.** Food service	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	☐ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.
☐ **G.** Refuse areas	☐ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ☐ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ☐ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	☐ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☐ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☐ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **H.** Industrial processes.	☐ Show process area.	☐ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	☐ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☑ **I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	☑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ☑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ☑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	☑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **J. Vehicle and Equipment Cleaning**	☐ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	☐ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ☐ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ☐**Car dealerships and similar may rinse cars with water only.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary *containment areas.* ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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☐ L. Fuel Dispensing Areas	☐ Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ☐ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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☐ M. Loading Docks	☐ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ☐ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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☑ **N.** Fire Sprinkler Test Water		☑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☐ Condensate drain lines ☐ Rooftop equipment ☐ Drainage sumps ☑ Roofing, gutters, and trim. ☐ Other sources		☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ☐ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ☑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.	

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☐ **P.** Plazas, sidewalks, and parking lots.			☑ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9 O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

APPPENDIX 10 Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Vegetated Swale TC-30

Design Considerations

- Tributary Area
- Area Required
- Slope
- Water Availability

Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	●
☑	Metals	▲
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

California Experience

Caltrans constructed and monitored six vegetated swales in southern California. These swales were generally effective in reducing the volume and mass of pollutants in runoff. Even in the areas where the annual rainfall was only about 10 inches/yr, the vegetation did not require additional irrigation. One factor that strongly affected performance was the presence of large numbers of gophers at most of the sites. The gophers created earthen mounds, destroyed vegetation, and generally reduced the effectiveness of the controls for TSS reduction.

Advantages

- If properly designed, vegetated, and operated, swales can serve as an aesthetic, potentially inexpensive urban development or roadway drainage conveyance measure with significant collateral water quality benefits.

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- Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible.

Limitations

- Can be difficult to avoid channelization.
- May not be appropriate for industrial sites or locations where spills may occur
- Grassed swales cannot treat a very large drainage area. Large areas may be divided and treated using multiple swales.
- A thick vegetative cover is needed for these practices to function properly.
- They are impractical in areas with steep topography.
- They are not effective and may even erode when flow velocities are high, if the grass cover is not properly maintained.
- In some places, their use is restricted by law: many local municipalities require curb and gutter systems in residential areas.
- Swales are mores susceptible to failure if not properly maintained than other treatment BMPs.

Design and Sizing Guidelines

- Flow rate based design determined by local requirements or sized so that 85% of the annual runoff volume is discharged at less than the design rainfall intensity.
- Swale should be designed so that the water level does not exceed 2/3rds the height of the grass or 4 inches, which ever is less, at the design treatment rate.
- Longitudinal slopes should not exceed 2.5%
- Trapezoidal channels are normally recommended but other configurations, such as parabolic, can also provide substantial water quality improvement and may be easier to mow than designs with sharp breaks in slope.
- Swales constructed in cut are preferred, or in fill areas that are far enough from an adjacent slope to minimize the potential for gopher damage. Do not use side slopes constructed of fill, which are prone to structural damage by gophers and other burrowing animals.
- A diverse selection of low growing, plants that thrive under the specific site, climatic, and watering conditions should be specified. Vegetation whose growing season corresponds to the wet season are preferred. Drought tolerant vegetation should be considered especially for swales that are not part of a regularly irrigated landscaped area.
- The width of the swale should be determined using Manning's Equation using a value of 0.25 for Manning's n.

Construction/Inspection Considerations

- Include directions in the specifications for use of appropriate fertilizer and soil amendments based on soil properties determined through testing and compared to the needs of the vegetation requirements.
- Install swales at the time of the year when there is a reasonable chance of successful establishment without irrigation; however, it is recognized that rainfall in a given year may not be sufficient and temporary irrigation may be used.
- If sod tiles must be used, they should be placed so that there are no gaps between the tiles; stagger the ends of the tiles to prevent the formation of channels along the swale or strip.
- Use a roller on the sod to ensure that no air pockets form between the sod and the soil.
- Where seeds are used, erosion controls will be necessary to protect seeds for at least 75 days after the first rainfall of the season.

Performance

The literature suggests that vegetated swales represent a practical and potentially effective technique for controlling urban runoff quality. While limited quantitative performance data exists for vegetated swales, it is known that check dams, slight slopes, permeable soils, dense grass cover, increased contact time, and small storm events all contribute to successful pollutant removal by the swale system. Factors decreasing the effectiveness of swales include compacted soils, short runoff contact time, large storm events, frozen ground, short grass heights, steep slopes, and high runoff velocities and discharge rates.

Conventional vegetated swale designs have achieved mixed results in removing particulate pollutants. A study performed by the Nationwide Urban Runoff Program (NURP) monitored three grass swales in the Washington, D.C., area and found no significant improvement in urban runoff quality for the pollutants analyzed. However, the weak performance of these swales was attributed to the high flow velocities in the swales, soil compaction, steep slopes, and short grass height.

Another project in Durham, NC, monitored the performance of a carefully designed artificial swale that received runoff from a commercial parking lot. The project tracked 11 storms and concluded that particulate concentrations of heavy metals (Cu, Pb, Zn, and Cd) were reduced by approximately 50 percent. However, the swale proved largely ineffective for removing soluble nutrients.

The effectiveness of vegetated swales can be enhanced by adding check dams at approximately 17 meter (50 foot) increments along their length (See Figure 1). These dams maximize the retention time within the swale, decrease flow velocities, and promote particulate settling. Finally, the incorporation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.

Only 9 studies have been conducted on all grassed channels designed for water quality (Table 1). The data suggest relatively high removal rates for some pollutants, but negative removals for some bacteria, and fair performance for phosphorus.

Table 1 Grassed swale pollutant removal efficiency data							
	Removal Efficiencies (% Removal)						
Study	TSS	TP	TN	NO_3	Metals	Bacteria	Type
Caltrans 2002	77	8	67	66	83-90	-33	dry swales
Goldberg 1993	67.8	4.5	-	31.4	42–62	-100	grassed channel
Seattle Metro and Washington Department of Ecology 1992	60	45	-	-25	2–16	-25	grassed channel
Seattle Metro and Washington Department of Ecology, 1992	83	29	-	-25	46–73	-25	grassed channel
Wang et al., 1981	80	-	-	-	70–80	-	dry swale
Dorman et al., 1989	98	18	-	45	37–81	-	dry swale
Harper, 1988	87	83	84	80	88–90	-	dry swale
Kercher et al., 1983	99	99	99	99	99	-	dry swale
Harper, 1988.	81	17	40	52	37–69	-	wet swale
Koon, 1995	67	39	-	9	-35 to 6	-	wet swale

While it is difficult to distinguish between different designs based on the small amount of available data, grassed channels generally have poorer removal rates than wet and dry swales, although some swales appear to export soluble phosphorus (Harper, 1988; Koon, 1995). It is not clear why swales export bacteria. One explanation is that bacteria thrive in the warm swale soils.

Siting Criteria

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system (Schueler et al., 1992). In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5 %. Use of natural topographic lows is encouraged and natural drainage courses should be regarded as significant local resources to be kept in use (Young et al., 1996).

Selection Criteria (NCTCOG, 1993)

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods, but may be necessary only to prevent the vegetation from dying.

The topography of the site should permit the design of a channel with appropriate slope and cross-sectional area. Site topography may also dictate a need for additional structural controls. Recommendations for longitudinal slopes range between 2 and 6 percent. Flatter slopes can be used, if sufficient to provide adequate conveyance. Steep slopes increase flow velocity, decrease detention time, and may require energy dissipating and grade check. Steep slopes also can be managed using a series of check dams to terrace the swale and reduce the slope to within acceptable limits. The use of check dams with swales also promotes infiltration.

Additional Design Guidelines

Most of the design guidelines adopted for swale design specify a minimum hydraulic residence time of 9 minutes. This criterion is based on the results of a single study conducted in Seattle, Washington (Seattle Metro and Washington Department of Ecology, 1992), and is not well supported. Analysis of the data collected in that study indicates that pollutant removal at a residence time of 5 minutes was not significantly different, although there is more variability in that data. Therefore, additional research in the design criteria for swales is needed. Substantial pollutant removal has also been observed for vegetated controls designed solely for conveyance (Barrett et al, 1998); consequently, some flexibility in the design is warranted.

Many design guidelines recommend that grass be frequently mowed to maintain dense coverage near the ground surface. Recent research (Colwell et al., 2000) has shown mowing frequency or grass height has little or no effect on pollutant removal.

Summary of Design Recommendations

1) The swale should have a length that provides a minimum hydraulic residence time of at least 10 minutes. The maximum bottom width should not exceed 10 feet unless a dividing berm is provided. The depth of flow should not exceed 2/3rds the height of the grass at the peak of the water quality design storm intensity. The channel slope should not exceed 2.5%.

2) A design grass height of 6 inches is recommended.

3) Regardless of the recommended detention time, the swale should be not less than 100 feet in length.

4) The width of the swale should be determined using Manning's Equation, at the peak of the design storm, using a Manning's n of 0.25.

5) The swale can be sized as both a treatment facility for the design storm and as a conveyance system to pass the peak hydraulic flows of the 100-year storm if it is located "on-line." The side slopes should be no steeper than 3:1 (H:V).

6) Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible. If flow is to be introduced through curb cuts, place pavement slightly above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

7) Swales must be vegetated in order to provide adequate treatment of runoff. It is important to maximize water contact with vegetation and the soil surface. For general purposes, select fine, close-growing, water-resistant grasses. If possible, divert runoff (other than necessary irrigation) during the period of vegetation

establishment. Where runoff diversion is not possible, cover graded and seeded areas with suitable erosion control materials.

Maintenance

The useful life of a vegetated swale system is directly proportional to its maintenance frequency. If properly designed and regularly maintained, vegetated swales can last indefinitely. The maintenance objectives for vegetated swale systems include keeping up the hydraulic and removal efficiency of the channel and maintaining a dense, healthy grass cover.

Maintenance activities should include periodic mowing (with grass never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages. Cuttings should be removed from the channel and disposed in a local composting facility. Accumulated sediment should also be removed manually to avoid concentrated flows in the swale. The application of fertilizers and pesticides should be minimal.

Another aspect of a good maintenance plan is repairing damaged areas within a channel. For example, if the channel develops ruts or holes, it should be repaired utilizing a suitable soil that is properly tamped and seeded. The grass cover should be thick; if it is not, reseed as necessary. Any standing water removed during the maintenance operation must be disposed to a sanitary sewer at an approved discharge location. Residuals (e.g., silt, grass cuttings) must be disposed in accordance with local or State requirements. Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover. Typical maintenance activities are summarized below:

- Inspect swales at least twice annually for erosion, damage to vegetation, and sediment and debris accumulation preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the swale is ready for winter. However, additional inspection after periods of heavy runoff is desirable. The swale should be checked for debris and litter, and areas of sediment accumulation.

- Grass height and mowing frequency may not have a large impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

- Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

- Sediment accumulating near culverts and in channels should be removed when it builds up to 75 mm (3 in.) at any spot, or covers vegetation.

- Regularly inspect swales for pools of standing water. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g. debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained.

Cost

Construction Cost

Little data is available to estimate the difference in cost between various swale designs. One study (SWRPC, 1991) estimated the construction cost of grassed channels at approximately $0.25 per ft². This price does not include design costs or contingencies. Brown and Schueler (1997) estimate these costs at approximately 32 percent of construction costs for most stormwater management practices. For swales, however, these costs would probably be significantly higher since the construction costs are so low compared with other practices. A more realistic estimate would be a total cost of approximately $0.50 per ft², which compares favorably with other stormwater management practices.

Table 2 Swale Cost Estimate (SEWRPC, 1991)

Component	Unit	Extent	Unit Cost			Total Cost		
			Low	Moderate	High	Low	Moderate	High
Mobilization / Demobilization-Light	Swale	1	$107	$274	$441	$107	$274	$441
Site Preparation								
Clearing[b]	Acre	0.5	$2,200	$3,800	$5,400	$1,100	$1,900	$2,700
Grubbing[c]	Acre	0.25	$3,800	$5,200	$6,600	$950	$1,300	$1,650
General Excavation[d]	Yd^3	372	$2.10	$3.70	$5.30	$781	$1,376	$1,972
Level and Till[e]	Yd^2	1,210	$0.20	$0.35	$0.50	$242	$424	$605
Sites Development								
Salvaged Topsoil Seed, and Mulch[f]	Yd^2	1,210	$0.40	$1.00	$1.60	$484	$1,210	$1,936
Sod[g]	Yd^2	1,210	$1.20	$2.40	$3.60	$1,452	$2,904	$4,356
Subtotal	--	–	--	–	--	$5,116	$9,388	$13,660
Contingencies	Swale	1	25%	25%	25%	$1,279	$2,347	$3,415
Total	--	–	--	–	--	$6,395	$11,735	$17,075

Source: (SEWRPC, 1991)

Note: Mobilization/demobilization refers to the organization and planning involved in establishing a vegetative swale.

[a] Swale has a bottom width of 1.0 foot, a top width of 10 feet with 1:3 side slopes, and a 1,000-foot length.

[b] Area cleared = (top width + 10 feet) x swale length.

[c] Area grubbed = (top width x swale length).

[d] Volume excavated = (0.67 x top width x swale depth) x swale length (parabolic cross-section).

[e] Area tilled = $\left(\text{top width} + \frac{8(\text{swale depth}^2)}{3(\text{top width})}\right) \times$ swale length (parabolic cross-section).

[f] Area seeded = area cleared x 0.5.

[g] Area sodded = area cleared x 0.5.

Table 3 Estimated Maintenance Costs (SEWRPC, 1991)

Component	Unit Cost	Swale Size (Depth and Top Width)		Comment
		1.5 Foot Depth, One-Foot Bottom Width, 10-Foot Top Width	3-Foot Depth, 3-Foot Bottom Width, 21-Foot Top Width	
Lawn Mowing	\$0.85 / 1,000 ft^2 / mowing	\$0.14 / linear foot	\$0.21 / linear foot	Lawn maintenance area=(top width + 10 feet) x length. Mow eight times per year
General Lawn Care	\$9.00 / 1,000 ft^2 / year	\$0.18 / linear foot	\$0.28 / linear foot	Lawn maintenance area = (top width + 10 feet) x length
Swale Debris and Litter Removal	\$0.10 / linear foot / year	\$0.10 / linear foot	\$0.10 / linear foot	–
Grass Reseeding with Mulch and Fertilizer	\$0.30 / yd^2	\$0.01 / linear foot	\$0.01 / linear foot	Area revegetated equals 1% of lawn maintenance area per year
Program Administration and Swale Inspection	\$0.15 / linear foot / year, plus \$25 / inspection	\$0.15 / linear foot	\$0.15 / linear foot	Inspect four times per year
Total	--	**\$0.58 / linear foot**	**\$ 0.75 / linear foot**	--

Maintenance Cost

Caltrans (2002) estimated the expected annual maintenance cost for a swale with a tributary area of approximately 2 ha at approximately $2,700. Since almost all maintenance consists of mowing, the cost is fundamentally a function of the mowing frequency. Unit costs developed by SEWRPC are shown in Table 3. In many cases vegetated channels would be used to convey runoff and would require periodic mowing as well, so there may be little additional cost for the water quality component. Since essentially all the activities are related to vegetation management, no special training is required for maintenance personnel.

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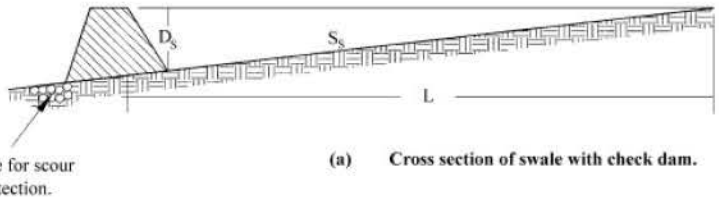
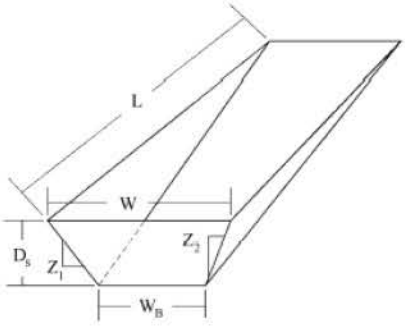


(a) Cross section of swale with check dam.



(b) Dimensional view of swale impoundment area.

Notation:
L = Length of swale impoundment area per check dam (ft)
D_S = Depth of check dam (ft)
S_S = Bottom slpe of swale (ft/ft)
W = Top width of check dam (ft)
W_B = Bottom width of check dam (ft)
$Z_{1\&2}$ = Ratio of horizontal to vertical change in swale side slope (ft/ft)

Bioretention TC-32

Design Considerations

- Soil for Infiltration
- Tributary Area
- Slope
- Aesthetics
- Environmental Side-effects

Description

The bioretention best management practice (BMP) functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through buffer strip and subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend ***(Removal Effectiveness)***

- ● Low
- ▲ Medium
- ■ High

California Experience

None documented. Bioretention has been used as a stormwater BMP since 1992. In addition to Prince George's County, MD and Alexandria, VA, bioretention has been used successfully at urban and suburban areas in Montgomery County, MD; Baltimore County, MD; Chesterfield County, VA; Prince William County, VA; Smith Mountain Lake State Park, VA; and Cary, NC.

Advantages

- Bioretention provides stormwater treatment that enhances the quality of downstream water bodies by temporarily storing runoff in the BMP and releasing it over a period of four days to the receiving water (EPA, 1999).
- The vegetation provides shade and wind breaks, absorbs noise, and improves an area's landscape.

Limitations

- The bioretention BMP is not recommended for areas with slopes greater than 20% or where mature tree removal would

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be required since clogging may result, particularly if the BMP receives runoff with high sediment loads (EPA, 1999).

- Bioretention is not a suitable BMP at locations where the water table is within 6 feet of the ground surface and where the surrounding soil stratum is unstable.
- By design, bioretention BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water.
- In cold climates the soil may freeze, preventing runoff from infiltrating into the planting soil.

Design and Sizing Guidelines

- The bioretention area should be sized to capture the design storm runoff.
- In areas where the native soil permeability is less than 0.5 in/hr an underdrain should be provided.
- Recommended minimum dimensions are 15 feet by 40 feet, although the preferred width is 25 feet. Excavated depth should be 4 feet.
- Area should drain completely within 72 hours.
- Approximately 1 tree or shrub per 50 ft^2 of bioretention area should be included.
- Cover area with about 3 inches of mulch.

Construction/Inspection Considerations

Bioretention area should not be established until contributing watershed is stabilized.

Performance

Bioretention removes stormwater pollutants through physical and biological processes, including adsorption, filtration, plant uptake, microbial activity, decomposition, sedimentation and volatilization (EPA, 1999). Adsorption is the process whereby particulate pollutants attach to soil (e.g., clay) or vegetation surfaces. Adequate contact time between the surface and pollutant must be provided for in the design of the system for this removal process to occur. Thus, the infiltration rate of the soils must not exceed those specified in the design criteria or pollutant removal may decrease. Pollutants removed by adsorption include metals, phosphorus, and hydrocarbons. Filtration occurs as runoff passes through the bioretention area media, such as the sand bed, ground cover, and planting soil.

Common particulates removed from stormwater include particulate organic matter, phosphorus, and suspended solids. Biological processes that occur in wetlands result in pollutant uptake by plants and microorganisms in the soil. Plant growth is sustained by the uptake of nutrients from the soils, with woody plants locking up these nutrients through the seasons. Microbial activity within the soil also contributes to the removal of nitrogen and organic matter. Nitrogen is removed by nitrifying and denitrifying bacteria, while aerobic bacteria are responsible for the decomposition of the organic matter. Microbial processes require oxygen and can result in depleted oxygen levels if the bioretention area is not adequately

aerated. Sedimentation occurs in the swale or ponding area as the velocity slows and solids fall out of suspension.

The removal effectiveness of bioretention has been studied during field and laboratory studies conducted by the University of Maryland (Davis et al, 1998). During these experiments, synthetic stormwater runoff was pumped through several laboratory and field bioretention areas to simulate typical storm events in Prince George's County, MD. Removal rates for heavy metals and nutrients are shown in Table 1.

Table 1 Laboratory and Estimated Bioretention Davis et al. (1998); PGDER (1993)

Pollutant	Removal Rate
Total Phosphorus	70-83%
Metals (Cu, Zn, Pb)	93-98%
TKN	68-80%
Total Suspended Solids	90%
Organics	90%
Bacteria	90%

Results for both the laboratory and field experiments were similar for each of the pollutants analyzed. Doubling or halving the influent pollutant levels had little effect on the effluent pollutants concentrations (Davis et al, 1998).

The microbial activity and plant uptake occurring in the bioretention area will likely result in higher removal rates than those determined for infiltration BMPs.

Siting Criteria

Bioretention BMPs are generally used to treat stormwater from impervious surfaces at commercial, residential, and industrial areas (EPA, 1999). Implementation of bioretention for stormwater management is ideal for median strips, parking lot islands, and swales. Moreover, the runoff in these areas can be designed to either divert directly into the bioretention area or convey into the bioretention area by a curb and gutter collection system.

The best location for bioretention areas is upland from inlets that receive sheet flow from graded areas and at areas that will be excavated (EPA, 1999). In order to maximize treatment effectiveness, the site must be graded in such a way that minimizes erosive conditions as sheet flow is conveyed to the treatment area. Locations where a bioretention area can be readily incorporated into the site plan without further environmental damage are preferred. Furthermore, to effectively minimize sediment loading in the treatment area, bioretention only should be used in stabilized drainage areas.

Additional Design Guidelines

The layout of the bioretention area is determined after site constraints such as location of utilities, underlying soils, existing vegetation, and drainage are considered (EPA, 1999). Sites with loamy sand soils are especially appropriate for bioretention because the excavated soil can be backfilled and used as the planting soil, thus eliminating the cost of importing planting soil.

The use of bioretention may not be feasible given an unstable surrounding soil stratum, soils with clay content greater than 25 percent, a site with slopes greater than 20 percent, and/or a site with mature trees that would be removed during construction of the BMP.

Bioretention can be designed to be off-line or on-line of the existing drainage system (EPA, 1999). The drainage area for a bioretention area should be between 0.1 and 0.4 hectares (0.25 and 1.0 acres). Larger drainage areas may require multiple bioretention areas. Furthermore, the maximum drainage area for a bioretention area is determined by the expected rainfall intensity and runoff rate. Stabilized areas may erode when velocities are greater than 5 feet per second (1.5 meter per second). The designer should determine the potential for erosive conditions at the site.

The size of the bioretention area, which is a function of the drainage area and the runoff generated from the area is sized to capture the water quality volume.

The recommended minimum dimensions of the bioretention area are 15 feet (4.6 meters) wide by 40 feet (12.2 meters) long, where the minimum width allows enough space for a dense, randomly-distributed area of trees and shrubs to become established. Thus replicating a natural forest and creating a microclimate, thereby enabling the bioretention area to tolerate the effects of heat stress, acid rain, runoff pollutants, and insect and disease infestations which landscaped areas in urban settings typically are unable to tolerate. The preferred width is 25 feet (7.6 meters), with a length of twice the width. Essentially, any facilities wider than 20 feet (6.1 meters) should be twice as long as they are wide, which promotes the distribution of flow and decreases the chances of concentrated flow.

In order to provide adequate storage and prevent water from standing for excessive periods of time the ponding depth of the bioretention area should not exceed 6 inches (15 centimeters). Water should not be left to stand for more than 72 hours. A restriction on the type of plants that can be used may be necessary due to some plants' water intolerance. Furthermore, if water is left standing for longer than 72 hours mosquitoes and other insects may start to breed.

The appropriate planting soil should be backfilled into the excavated bioretention area. Planting soils should be sandy loam, loamy sand, or loam texture with a clay content ranging from 10 to 25 percent.

Generally the soil should have infiltration rates greater than 0.5 inches (1.25 centimeters) per hour, which is typical of sandy loams, loamy sands, or loams. The pH of the soil should range between 5.5 and 6.5, where pollutants such as organic nitrogen and phosphorus can be adsorbed by the soil and microbial activity can flourish. Additional requirements for the planting soil include a 1.5 to 3 percent organic content and a maximum 500 ppm concentration of soluble salts.

Soil tests should be performed for every 500 cubic yards (382 cubic meters) of planting soil, with the exception of pH and organic content tests, which are required only once per bioretention area (EPA, 1999). Planting soil should be 4 inches (10.1 centimeters) deeper than the bottom of the largest root ball and 4 feet (1.2 meters) altogether. This depth will provide adequate soil for the plants' root systems to become established, prevent plant damage due to severe wind, and provide adequate moisture capacity. Most sites will require excavation in order to obtain the recommended depth.

Planting soil depths of greater than 4 feet (1.2 meters) may require additional construction practices such as shoring measures (EPA, 1999). Planting soil should be placed in 18 inches or greater lifts and lightly compacted until the desired depth is reached. Since high canopy trees may be destroyed during maintenance the bioretention area should be vegetated to resemble a terrestrial forest community ecosystem that is dominated by understory trees. Three species each of both trees and shrubs are recommended to be planted at a rate of 2500 trees and shrubs per hectare (1000 per acre). For instance, a 15 foot (4.6 meter) by 40 foot (12.2 meter) bioretention area (600 square feet or 55.75 square meters) would require 14 trees and shrubs. The shrub-to-tree ratio should be 2:1 to 3:1.

Trees and shrubs should be planted when conditions are favorable. Vegetation should be watered at the end of each day for fourteen days following its planting. Plant species tolerant of pollutant loads and varying wet and dry conditions should be used in the bioretention area.

The designer should assess aesthetics, site layout, and maintenance requirements when selecting plant species. Adjacent non-native invasive species should be identified and the designer should take measures, such as providing a soil breach to eliminate the threat of these species invading the bioretention area. Regional landscaping manuals should be consulted to ensure that the planting of the bioretention area meets the landscaping requirements established by the local authorities. The designers should evaluate the best placement of vegetation within the bioretention area. Plants should be placed at irregular intervals to replicate a natural forest. Trees should be placed on the perimeter of the area to provide shade and shelter from the wind. Trees and shrubs can be sheltered from damaging flows if they are placed away from the path of the incoming runoff. In cold climates, species that are more tolerant to cold winds, such as evergreens, should be placed in windier areas of the site.

Following placement of the trees and shrubs, the ground cover and/or mulch should be established. Ground cover such as grasses or legumes can be planted at the beginning of the growing season. Mulch should be placed immediately after trees and shrubs are planted. Two to 3 inches (5 to 7.6 cm) of commercially-available fine shredded hardwood mulch or shredded hardwood chips should be applied to the bioretention area to protect from erosion.

Maintenance

The primary maintenance requirement for bioretention areas is that of inspection and repair or replacement of the treatment area's components. Generally, this involves nothing more than the routine periodic maintenance that is required of any landscaped area. Plants that are appropriate for the site, climatic, and watering conditions should be selected for use in the bioretention cell. Appropriately selected plants will aide in reducing fertilizer, pesticide, water, and overall maintenance requirements. Bioretention system components should blend over time through plant and root growth, organic decomposition, and the development of a natural

soil horizon. These biologic and physical processes over time will lengthen the facility's life span and reduce the need for extensive maintenance.

Routine maintenance should include a biannual health evaluation of the trees and shrubs and subsequent removal of any dead or diseased vegetation (EPA, 1999). Diseased vegetation should be treated as needed using preventative and low-toxic measures to the extent possible. BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water. Routine inspections for areas of standing water within the BMP and corrective measures to restore proper infiltration rates are necessary to prevent creating mosquito and other vector habitat. In addition, bioretention BMPs are susceptible to invasion by aggressive plant species such as cattails, which increase the chances of water standing and subsequent vector production if not routinely maintained.

In order to maintain the treatment area's appearance it may be necessary to prune and weed. Furthermore, mulch replacement is suggested when erosion is evident or when the site begins to look unattractive. Specifically, the entire area may require mulch replacement every two to three years, although spot mulching may be sufficient when there are random void areas. Mulch replacement should be done prior to the start of the wet season.

New Jersey's Department of Environmental Protection states in their bioretention systems standards that accumulated sediment and debris removal (especially at the inflow point) will normally be the primary maintenance function. Other potential tasks include replacement of dead vegetation, soil pH regulation, erosion repair at inflow points, mulch replenishment, unclogging the underdrain, and repairing overflow structures. There is also the possibility that the cation exchange capacity of the soils in the cell will be significantly reduced over time. Depending on pollutant loads, soils may need to be replaced within 5-10 years of construction (LID, 2000).

Cost

Construction Cost

Construction cost estimates for a bioretention area are slightly greater than those for the required landscaping for a new development (EPA, 1999). A general rule of thumb (Coffman, 1999) is that residential bioretention areas average about $3 to $4 per square foot, depending on soil conditions and the density and types of plants used. Commercial, industrial and institutional site costs can range between $10 to $40 per square foot, based on the need for control structures, curbing, storm drains and underdrains.

Retrofitting a site typically costs more, averaging $6,500 per bioretention area. The higher costs are attributed to the demolition of existing concrete, asphalt, and existing structures and the replacement of fill material with planting soil. The costs of retrofitting a commercial site in Maryland, Kettering Development, with 15 bioretention areas were estimated at $111,600.

In any bioretention area design, the cost of plants varies substantially and can account for a significant portion of the expenditures. While these cost estimates are slightly greater than those of typical landscaping treatment (due to the increased number of plantings, additional soil excavation, backfill material, use of underdrains etc.), those landscaping expenses that would be required regardless of the bioretention installation should be subtracted when determining the net cost.

Perhaps of most importance, however, the cost savings compared to the use of traditional structural stormwater conveyance systems makes bioretention areas quite attractive financially. For example, the use of bioretention can decrease the cost required for constructing stormwater conveyance systems at a site. A medical office building in Maryland was able to reduce the amount of storm drain pipe that was needed from 800 to 230 feet - a cost savings of $24,000 (PGDER, 1993). And a new residential development spent a total of approximately $100,000 using bioretention cells on each lot instead of nearly $400,000 for the traditional stormwater ponds that were originally planned (Rappahanock,). Also, in residential areas, stormwater management controls become a part of each property owner's landscape, reducing the public burden to maintain large centralized facilities.

Maintenance Cost

The operation and maintenance costs for a bioretention facility will be comparable to those of typical landscaping required for a site. Costs beyond the normal landscaping fees will include the cost for testing the soils and may include costs for a sand bed and planting soil.

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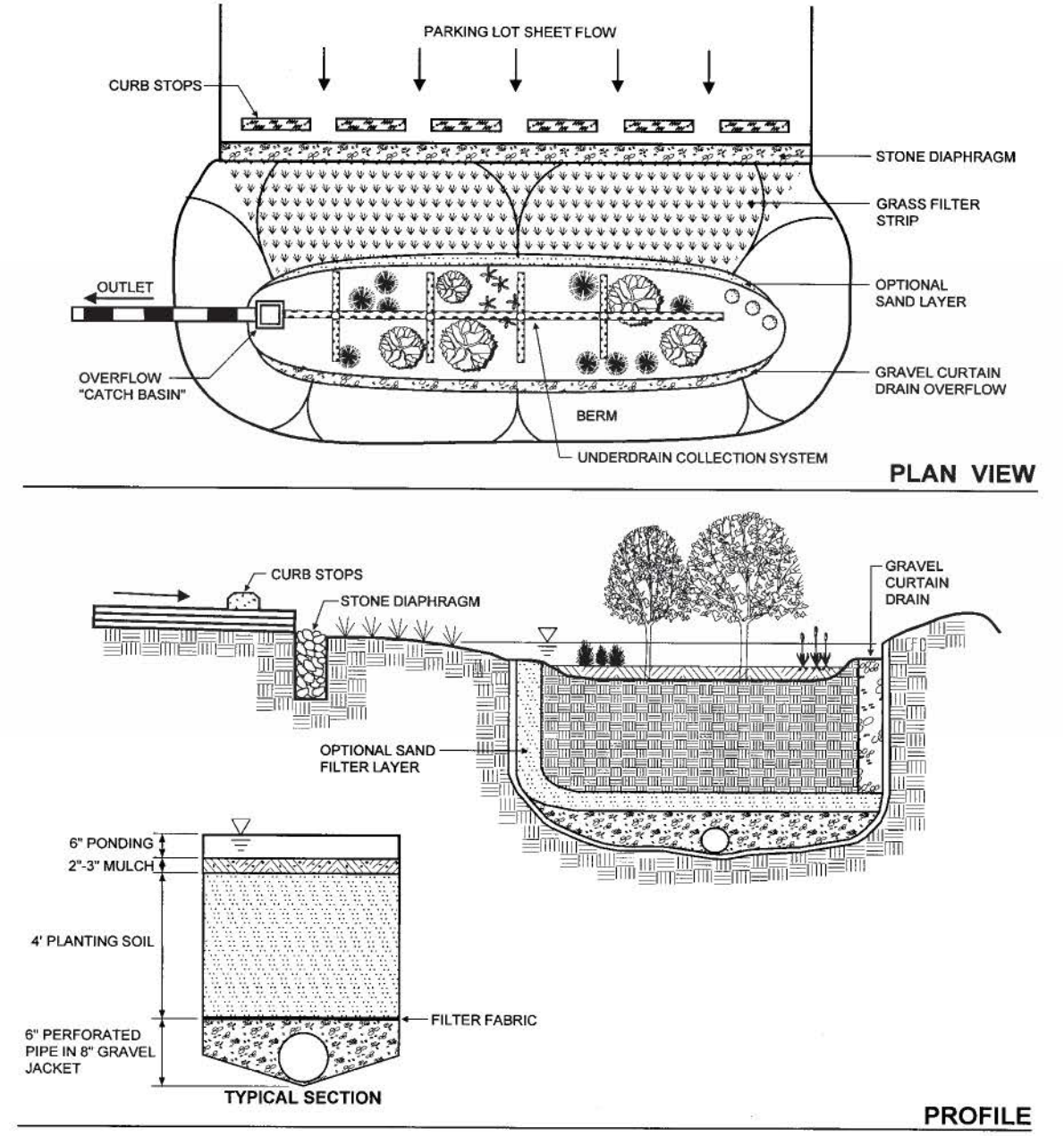

Schematic of a Bioretention Facility (MDE, 2000)

3.3 Permeable Pavement

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evaporation
Maximum Drainage Area	10 acres
Other Names	porous pavement, pervious concrete, pervious asphalt, pervious gravel pavement, cobblestone block, modular block, modular pavement

Description

Permeable pavements can be either pervious asphalt and concrete surfaces, or permeable modular block. Unlike traditional pavements that are impermeable, permeable pavements reduce the volume and peak of stormwater runoff as well as mitigate pollutants from stormwater runoff, provided that the underlying soils can accept infiltration. Permeable pavement surfaces work best when they are designed to be flat or with gentle slopes. This factsheet discusses criteria that apply to infiltration designs.

The permeable surface is placed on top of a reservoir layer that holds the water quality stormwater volume, $V_{BMP.}$ The water infiltrates from the reservoir layer into the native subsoil. Tests must be performed according to the Infiltration Testing Section in Appendix A to be able to use this design procedure.

In some circumstances, permeable pavement may be implemented on a project as a source control feature. Where implemented as a source control feature (sometimes referred to as a 'self-retaining' area), the pavement is not considered a 'BMP' that would be required to be designed and sized per this manual. Where permeable pavement receives runoff from adjacent tributary areas, the permeable pavement *may* be considered a BMP that must be sized according to this manual. Consult the Engineering Authority and the WQMP for any applicable requirements for designing and sizing permeable pavement installations.

Siting Considerations

The WQMP applicable to the project location should be consulted, as it may include criteria for determining the applicability of this and other Infiltration-based BMPs to the project.

Permeable pavements can be used in the same manner as concrete or asphalt in low traffic parking lots, playgrounds, walkways, bike trails, and sports courts. Most types of permeable pavement can be designed to meet Americans with Disabilities Act (ADA) requirements. Permeable pavements **should not** be used in the following conditions:

- Downstream of erodible areas
- Downstream of areas with a high likelihood of pollutant spills
- Industrial or high vehicular traffic areas (25,000 or greater average daily traffic)
- Areas where geotechnical concerns, such as soils with low infiltration rates, would preclude the use of this BMP.

Sites with Impermeable Fire Lanes

Oftentimes, Fire Departments do not allow alternative pavement types including permeable pavement. They require traditional impermeable surfaces for fire lanes. In this situation, it is acceptable to use an impermeable surface for the fire lane drive aisles and permeable pavement for the remainder of the parking lot.

Where impermeable fire lanes are used in the design, the impermeable surface must slope towards the permeable pavement, and the base layers shall remain continuous underneath the two pavement types, as shown in Figure 1. This continuous reservoir layer helps to maintain infiltration throughout the pervious pavement site, and can still be considered as part of the total required storage area.

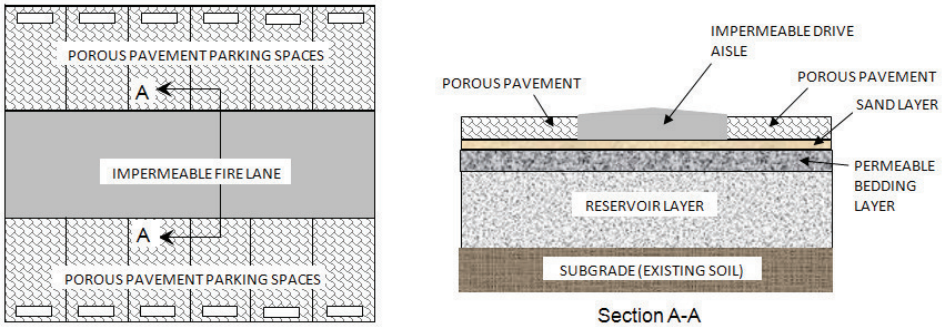

Figure 1: Impermeable Fire Lanes

Also, while a seal coat treatment may be used on the impermeable fire land, traditional seal coat treatments **shall not** be used on permeable pavement.

Setbacks

Always consult your geotechnical engineer for site specific recommendations regarding setbacks for permeable pavement. Recommended setbacks are needed to protect buildings, walls, onsite wells, streams and tanks.

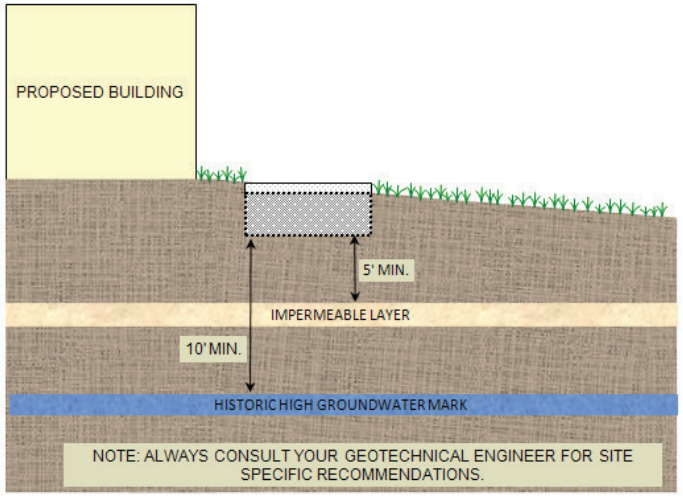

Figure 2: Permeable Pavement Setback Requirements

A minimum vertical separation of 10 feet is required from the bottom of the reservoir layer to the historic high groundwater mark, see Figure 2. A minimum vertical separation of 5 feet is required from the bottom of the reservoir layer to any impermeable layer in the soil. If the historic high groundwater mark is less than 10 feet below the reservoir layer section, or less than 5 feet from an impermeable layer, the infiltration design is not feasible.

Design and Sizing Criteria

To ensure that the pavement structural section is not compromised, a 24-hour drawdown time is utilized for this BMP instead of the longer drawdown time used for most volume based BMPs.

Reservoir Layer Considerations

Even with proper maintenance, sediment will begin to clog the soil below the permeable pavement. Since the soil cannot be scarified or replaced, this will result in slower infiltration rates over the life of the permeable pavement. Therefore, the reservoir layer is limited to a maximum of 12 inches in depth to ensure that over the life of the BMP, the reservoir layer will drain in an adequate time.

***Note**: All permeable pavement BMP installations (not including Permeable Pavement as a source control BMP i.e. a self-retaining area) must be tested by the geotechnical engineer to ensure that the soils drain at a minimum allowable rate to ensure drainage.. See the Infiltration Testing Section of this manual for specific details for the required testing and applied factors of safety.*

Sloping Permeable Pavement

Ideally permeable pavement would be level, however most sites will have a mild slope. If the tributary drainage area is too steep, the water may be flowing too fast when it approaches the permeable pavement, which may cause water to pass over the pavement instead of percolating and entering the reservoir layer. If the maximum slopes shown in Table 1 are complied with, it should address these concerns.

Table 1: Design Parameters for Permeable Pavement

Design Parameter	Permeable Pavement
Maximum slope of permeable pavement	3%
Maximum contributing area slope	5%

Regardless of the slope of the pavement surface design, the bottom of the reservoir layers **shall be flat and level** as shown in Figure 3. The design shown ensures that the water quality volume will be contained in the reservoir layer. A terraced design utilizing non-permeable check dams may be a useful option when the depth of gravel becomes too great as shown in Figure 3.

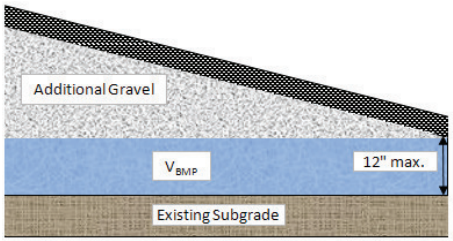

Figure 3: Sloped Cross Sections for Permeable Pavement

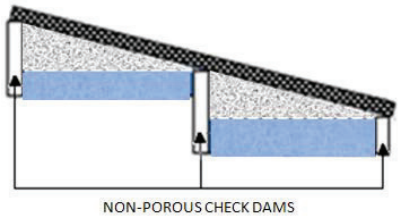

Figure 4: Permeable Pavement with Non-permeable Check Dams

In Figure 4, the bottom of the gravel reservoir layer is incorrectly sloped parallel to the pavement surface. Water would only be allowed to pond up to the lowest point of the BMP. Additional flows would simply discharge from the pavement. Since only a portion of the gravel layer can store water, this design would result in insufficient capacity. This is not acceptable.

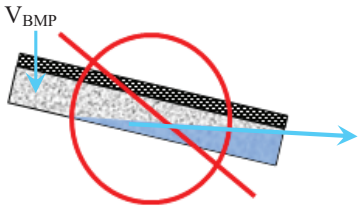

Figure 5: Incorrect Sloping of Permeable Pavement

To assure that the subgrade will empty within the 24 hour drawdown time, it is important that the maximum depth of 12 inches for the reservoir layer discussed in the design procedure is not exceeded. The value should be measured from the lowest elevation of the slope (Figure 4).

Minimum Surface Area

The minimum surface area required, A_S, is calculated by dividing the water quality volume, V_{BMP}, by the depth of water stored in the reservoir layer. The depth of water is found by multiplying the void ratio of the reservoir aggregate by the depth of the layer, b_{TH}. The void ratio of the reservoir aggregate is typically 40%; the maximum reservoir layer depth is 12".

Sediment Control

A pretreatment BMP should be used for sediment control. This pretreatment BMP will reduce the amount of sediment that enters the system and reduce clogging. The pretreatment BMP will also help to spread runoff flows, which allows the system to infiltrate more evenly. The pretreatment BMP must discharge to the surface of the pavement and not the subgrade. Grass swales may also be used as part of a treatment train with permeable pavements.

Liners and Filter Fabric

Always consult your geotechnical engineer for site specific recommendations regarding liners and filter fabrics. Filter fabric may be used around the edges of the permeable pavement; this will help keep fine sediments from entering the system. Unless recommended for the site, impermeable liners are not to be used below the subdrain gravel layer.

Overflow

An overflow route is needed in the permeable pavement design to bypass storm flows larger than the V_{BMP} or in the event of clogging. Overflow systems must connect to an acceptable discharge point such as a downstream conveyance system.

Roof Runoff

Permeable pavement can be used to treat roof runoff. However, the runoff cannot be discharged beneath the surface of the pavement directly into the subgrade, as shown in Figure 6. Instead the pipe should empty on the surface of the permeable pavement as shown in Figure 7. A filter on the drainpipe should be used to help reduce the amount of sediment that enters the permeable pavement.

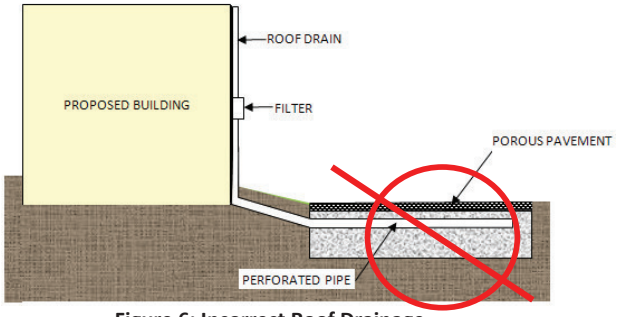

Figure 6: Incorrect Roof Drainage

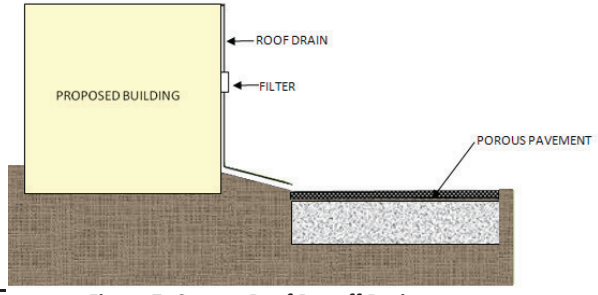

Figure 7: Correct Roof Runoff Drainage

Infiltration

Refer to the Infiltration Testing Section (Appendix A) in this manual for recommendations on testing for this BMP.

Pavement Section

The cross section necessary for infiltration design of permeable pavement includes:

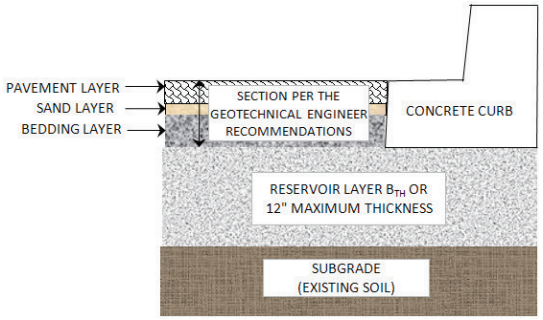

Figure 8: Infiltration Cross Section

- The thickness of the layers of permeable pavement, sand and bedding layers depends on whether it is permeable modular block or pervious pavement. A licensed geotechnical or civil engineer is required to determine the thickness of these upper layers appropriate for the pavement type and expected traffic loads.
- A 12" maximum reservoir layer consisting of AASHTO #57 gravel vibrated in place or equivalent with a minimum of 40% void ratio.

Inspection and Maintenance Schedule –Modular Block

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris
Utility Trenching and other pavement repairs	• Remove and reset modular blocks, structural section and reservoir layer as needed. Replace damaged blocks in-kind. • Do not pave repaired areas with impermeable surfaces.
After storm events	• Inspect areas for ponding
2-3 times per year	• Sweep to reduce the chance of clogging
As needed	• Sand between pavers may need to be replaced if infiltration capacity is lost

Inspection and Maintenance Schedule –Pervious Concrete/Asphalt

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris
Utility Trenching other pavement repairs	• Replace structural section and reservoir layer in kind. • Re-pave using pervious concrete/asphalt. Do not pave repaired areas with impermeable surfaces.
After storm events	• Inspect areas for ponding
2-3 times per year	• Vacuum the permeable pavement to reduce the chance of clogging
As needed	• Remove and replace damaged or destroyed permeable pavement

Design Procedure Permeable Pavement

1. Enter the Tributary Area, A_T.

2. Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

3. Enter the reservoir layer depth, b_{TH} for the proposed permeable pavement. The reservoir layer maximum depth is 12 inches.

4. Calculate the Minimum Surface Area, A_S, required.

$$A_S(\text{ft}) = \frac{V_{BMP}\ (\text{ft}^3)}{(0.4 \times b_{TH}\ (\text{in}))/12(\text{in/ft})}$$

   Where, the porosity of the gravel in the reservoir layer is assumed to be 40%.

5. Enter the proposed surface area and ensure that this is equal to or greater than the minimum surface area required.

6. Enter the dimensions, per the geotechnical engineer's recommendations, for the pavement cross section. The cross section includes a pavement layer, usually a sand layer and a permeable bedding layer. Then add this to the maximum thickness of the reservoir layer to find the total thickness of the BMP.

7. Enter the slope of the top of the permeable pavement. The maximum slope is 3%.

8. Enter whether sediment control was provided.

9. Enter whether the geotechnical approach is attached.

10. Describe the surfaces surrounding the permeable pavement. It is preferred that a vegetation buffer is used around the permeable pavement.
11. Check to ensure that vertical setbacks are met. There should be a minimum of 10 feet between the bottom of the BMP and the top of the high groundwater table, and a minimum of 5 feet between the reservoir layer the top of the impermeable layer.

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Appendix J

Noise Impact Analysis

NOISE IMPACT ANALYSIS
KASSAB TRAVEL CENTER PROJECT
CITY OF LAKE ELSINORE

LEAD AGENCY:
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COMMUNITY DEVELOPMENT DEPARTMENT
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PROJECT NO. 17028

DECEMBER 18, 2017

[REVISED OCTOBER 1, 2018]

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
ONAC	Federal Office of Noise Abatement and Control
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
UMTA	Federal Urban Mass Transit Administration

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise impacts associated with the proposed Kassab Travel Center project (proposed project). The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Information regarding the fundamentals of vibration;
- A description of the local noise guidelines and standards;
- An evaluation of the current noise environment;
- An analysis of the potential short-term construction-related noise impacts from the proposed project; and,
- An analysis of long-term operations-related noise impacts from the proposed project.

1.2 Site Location and Study Area

The project site is located in the northern portion of the City of Lake Elsinore (City) on the west corner of Riverside Drive and Collier Avenue at 29301 Riverside Drive. The approximately 2.84-acre project site is located on a vacant parcel that is bounded by commercial uses to the northwest, Collier Avenue and commercial uses to the northeast, Riverside Drive and vacant land to the southeast, and vacant land to the southwest. The project location is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest offsite sensitive receptors to the project site consist of workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet west of the project site. The nearest school to the project site is Temescal Canyon High School that is located as near as 0.5 mile north of the project site.

1.3 Proposed Project Description

The proposed project would consist of the development of an 18-vehicle fueling position gasoline and diesel station with two canopies that total 6,092 square feet, an 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive thru window. The proposed project would also include multiple parking areas with a total of 78-spaces. The proposed site plan is shown in Figure 2.

1.4 Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City of Lake Elsinore and State of California.

City of Lake Elsinore Municipal Code

<u>Section 17.176.080(A) – Maximum Permissible Sound Levels</u>

Section 17.176.060(A) of the Municipal Code limits onsite noise sources to 65 dBA between 7:00 a.m. and 10:00 p.m. and 60 dBA between 10:00 p.m. and 7:00 a.m. at the nearby commercial properties

located as near as 60 feet northwest of the project site. Compliance with this regulation will reduce the operations-related noise impacts to the nearby receptors.

Section 17.176.080(F) – Construction Noise Limits

Section 17.176.080(F)(1) of the City's Municipal Code restricts construction activities from occurring between the weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on weekends or holidays. Section 17.176.080(F)(2) of the City's Municipal Code limits construction noise that occurs at the nearby business uses to 85 dBA from mobile equipment and 75 dBA from stationary equipment and at the nearby single-family homes to 75 dBA for mobile equipment and 60 dBA for stationary equipment. Compliance with this regulation will reduce the construction-related noise impacts to the nearby receptors.

Section 17.176.080(G) – Vibration Limits

Section 17.176.080(G) of the City's Municipal Code restricts the operation of any device that creates a vibration which is above the vibration threshold of any individual at or beyond the property boundary of the source. Compliance with this regulation will reduce the construction-related vibration impacts to the nearby sensitive receptors.

State of California Rules

The following lists the State of California rules that are applicable to all non-residential projects in the State.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

1.5 Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

Expose persons to noise levels in excess of standards?

Potentially significant impact. Implementation of Mitigation Measures 1 and 2 would reduce the impact to less than significant levels.

Expose persons to excessive groundborne vibration?

Less than significant impact.

Result in a substantial permanent increase in ambient noise levels above existing levels without the proposed project?

Potentially significant impact. Implementation of Mitigation Measure 2 would reduce the impact to less than significant levels.

Result in a substantial temporary increase in ambient noise levels above existing levels without the proposed project?

Potentially significant impact. Implementation of Mitigation Measure 1 would reduce the impact to less than significant levels.

Expose persons to excessive noise levels from aircraft?

Less than significant impact.

1.6 Mitigation Measures Required for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.4 above and through implementation of the following mitigation all noise and vibration impacts would be reduced to less than significant levels.

Mitigation Measure 1:

The project applicant shall require any construction contractor that needs to use stationary construction equipment within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and nearest sensitive receptors.

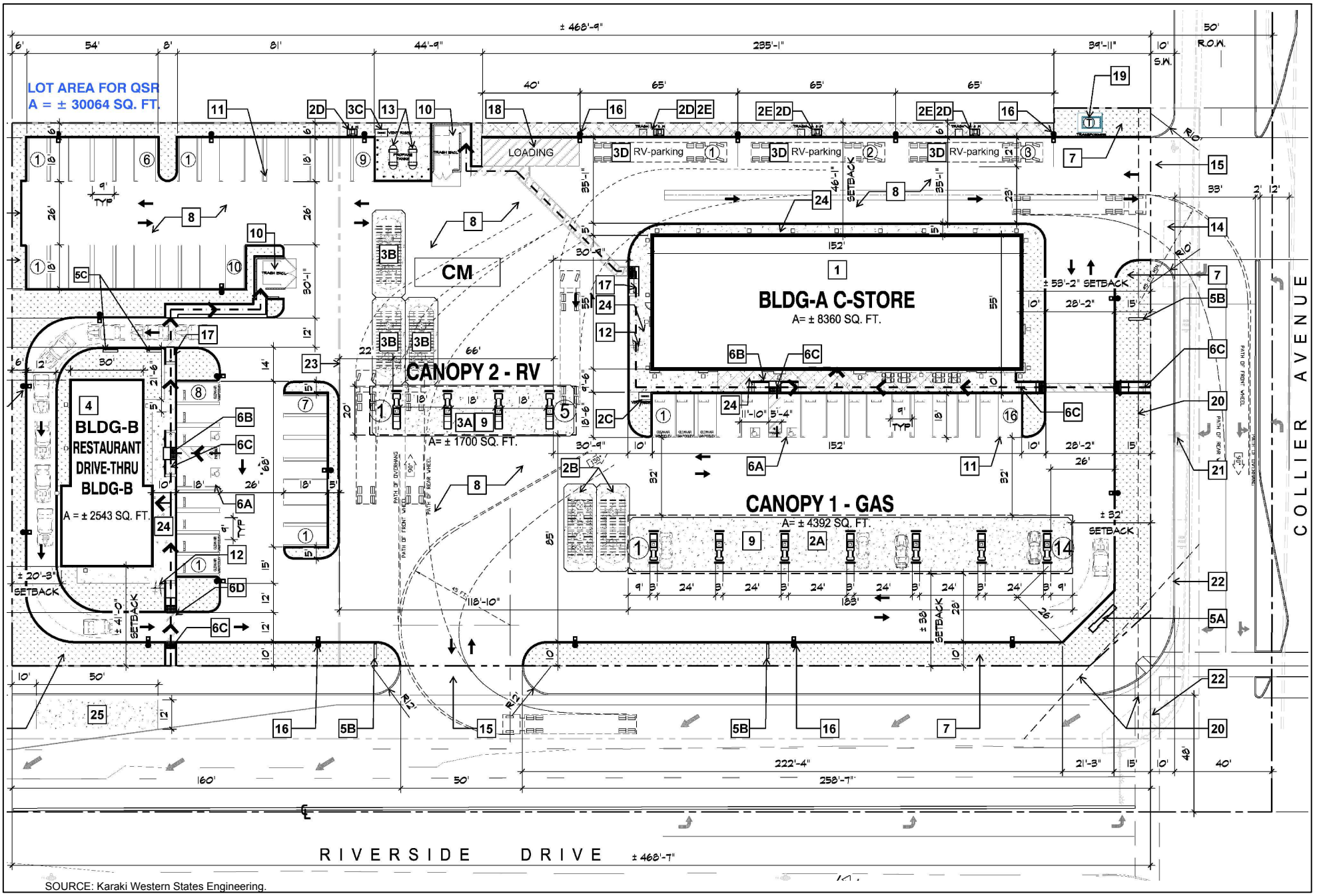
Mitigation Measure 2:

The project applicant shall construct a minimum 8-foot high masonry wall that is free of cutouts or openings along the northwest and southwest property lines of the project site. The portions of the walls that are within the setbacks of Riverside Drive and Collier Avenue shall be limited to 3 feet in height per the wall height limitations detailed in Sections 17.112.070 and 17.112.090 of the City of Lake Elsinore Municipal Code.

SOURCE: Google Earth

VISTA ENVIRONMENTAL

Figure 1
Project Location Map



SOURCE: Karaki Western States Engineering.

VISTA ENVIRONMENTAL

Figure 2
Proposed Site Plan

2.0 NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear.

2.1 Noise Descriptors

Noise Equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour Leq is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Level (Ldn) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn, except that it has another addition of 4.77 decibels to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these time periods because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound appears louder in the evening and nighttime hours and is weighted accordingly. The City of Lake Elsinore relies on the Ldn noise standard to assess transportation-related impacts on noise sensitive land uses.

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a "pure tone," there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to "stand out" against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away

from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis.

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

3.1 Vibration Descriptors

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is "VdB", which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration.

3.3 Vibration Propagation

The propagation of ground-borne vibration is not as simple to model as airborne noise. This is due to the fact that noise in the air travels through a relatively uniform median, while ground-borne vibrations travel through the earth which may contain significant geological differences. There are three main types of vibration propagation; surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 REGULATORY SETTING

The project site is located in the City of Lake Elsinore. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Although the proposed project is not under the jurisdiction of the FTA, the FTA is the only agency that has defined what constitutes a significant noise impact from implementing a project. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings are provided below in Table A.

Table A – FTA Project Effects on Cumulative Noise Exposure

Existing Noise Exposure (dBA Leq or Ldn)	Allowable Noise Impact Exposure dBA Leq or Ldn		
	Project Only	Combined	Noise Exposure Increase
45	51	52	+7
50	53	55	+5
55	55	58	+3
60	57	62	+2
65	60	66	+1
70	64	71	+1
75	65	75	0

Source: Federal Transit Administration, 2006.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Noise Standards

California Department of Health Services Office of Noise Control

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

Caltrans issued the *Transportation- and Construction-Induced Vibration Guidance Manual* in 2004. The manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

4.3 Local Regulations

The City of Lake Elsinore General Plan and Municipal Code establishes the following applicable policies related to noise and vibration.

City of Lake Elsinore General Plan

The following applicable goals and policies to the proposed project are from the Noise Element of the General Plan.

Goal 7 **Maintain an environment for all City residents and visitors free of unhealthy, obtrusive, or otherwise excessive noise.**

Policies:

7.1 Apply the noise standards set forth in the Lake Elsinore Noise and Land Use Compatibility Matrix (see Table B) and Interior and Exterior Noise Standards (see Table C) when considering all new development and redevelopment proposed within the City.

Table B – City of Lake Elsinore Noise and Land Use Compatibility Matrix

		Day-Night Noise Level (L_{dn})						
Land Use Categories	**Uses**	**<55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**	**>80**
Residential	Single-Family, Duplex, Multiple-Family	A	A	B	B	C	D	D
	Mobile Homes	A	A	B	C	C	D	D
Commercial Regional District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial Regional Village, District Special	Commercial, Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial Industrial Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial Regional Institutional Civic Center	Amphitheatre, Concert Hall, Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial General, Special Industrial Institutional	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional General	Hospital, Church, Library, Schools, Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
	Golf Course, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C

Land Use Categories	Uses	Day-Night Noise Level (L_{dn})						
		<55	55-60	60-65	65-70	70-75	75-80	>80
Agriculture	Agriculture	A	A	A	A	A	A	A

Interpretation:

Zone A: Clearly Compatible. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B: Normally Compatible. New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Zone C: Normally Incompatible. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Zone D: Clearly Incompatible. New construction or development should generally not be undertaken.

Source: City of Lake Elsinore General Plan, 2011.

Table C – City of Lake Elsinore Interior and Exterior Noise Standards

Land Use Categories	Uses	Energy Average L_{dn}	
		Interior[(1)]	Exterior[(2)]
Residential	Single-Family, Duplex, Multiple-Family	45[(3,5)]	60
	Mobile Homes	--	60[(4)]
Commercial, Institutional	Hotel, Motel, Transient Lodging	45[(5)]	--
	Hospital, School's Classroom	45	--
	Church, Library	45	--

Interpretation:
[1] Indoor environment excluding: bathrooms, toilets, closets, corridors.
[2] Outdoor environment limited to: private yard of single-family, multi-family private patio or balcony which is served by a means of exit from inside, Mobile Home Park.
[3] Noise level requirement with closed windows. Mechanical ventilation system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of UBC.
[4] Exterior noise level should be such that interior noise level will not exceed 45 CNEL.
[5] As per California Administrative Code, Title 24, Part 6, Division T25, Chapter 1, Subchapter 1, Article 4, Section T25-28.
Source: City of Lake Elsinore General Plan, 2011.

City of Lake Elsinore Municipal Code

The Lake Elsinore Municipal Code establishes the following applicable standards related to noise.

17.112.090 Gasoline Dispensing Establishments.

The provisions of this section shall apply to all new construction, reconstruction, and addition or conversion of use for service stations and other places where motor vehicle fuels are dispensed to the public.

H. Walls. A decorative masonry wall a minimum of six feet in height shall be constructed and maintained along all interior property lines abutting residential property. Where such walls abut or are adjacent to commercial/office uses they shall be not less than five feet in height. A minimum five-foot planter shall be provided adjacent to the wall. Walls may be waived where the gasoline dispensing facility and

abutting commercial or industrial use share a common driveway. Said wall shall be reduced to 36 inches within required yards adjacent to a public right-of-way.

17.176.060 Exterior Noise Limits.

A. Maximum Permissible Sound Levels by Receiving Land Use.

1. The noise standards for the various categories of land use identified by the Noise Control Office(r) as presented in Table 1 (see Table D) shall, unless otherwise specifically indicated, apply to all such property within a designated zone.

2. No person shall operate, or cause to be operated, any source of sound at any location within the incorporated City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on any other property, either incorporated or unincorporated to exceed:

    a. The noise standard for that land use as specified in Table 1 for a cumulative period of more than 30 minutes in any hour; or

    b. The noise standard plus five dB for a cumulative period of more than 15 minutes in any hour; or

    c. The noise standard plus 10 dB for a cumulative period of more than five minutes in any hour; or

    d. The noise standard plus 15 dB for a cumulative period of more than one minute in any hour; or

    e. The noise standard plus 20 dB or the maximum measured ambient level, for any period of time.

3. If the measured ambient level differs from that permissible within any of the last four noise limit categories above, the allowable noise exposure standard shall be adjusted in five dB increments in each category as appropriate to encompass or reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

4. If the measurement location is on a boundary between two different zones, the noise level limit applicable to the lower noise zone plus six dB shall apply.

Table D – City of Lake Elsinore Exterior Noise Limits

Receiving Land Use Category	Time Period	Noise Level (dBA)
Single-Family Residential	10:00 p.m. – 7:00 a.m.	40
	7:00 a.m. – 10:00 p.m.	50
Multiple Dwelling Residential	10:00 p.m. – 7:00 a.m.	45
	7:00 a.m. – 10:00 p.m.	50
Public Space		
Limited Commercial and Office	10:00 p.m. – 7:00 a.m.	55
	7:00 a.m. – 10:00 p.m.	60
General Commercial	10:00 p.m. – 7:00 a.m.	60
	7:00 a.m. – 10:00 p.m.	65
Light Industrial	Anytime	70
Heavy Industrial	Anytime	75

Source: City of Lake Elsinore Municipal Code Section 17.176.060.

17.176.080 Prohibited acts.

No person shall unnecessarily make, continue, or cause to be made or continued, any noise disturbance. The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:

B. Using or operating for any purpose any loudspeaker, loudspeaker system, or similar device between the hours of 10:00 p.m. and 7:00 a.m., such that the sound therefrom creates a noise disturbance across a residential real property line, or at any time violates the provisions of LEMC 17.176.060(A), except for any noncommercial public speaking, public assembly or other activity for which a variance has been issued by the City.

E. Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to cause a noise disturbance across a residential real property line or at any time to violate the provisions of LEMC

F. Construction/Demolition

1. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on weekends or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the City.

2. Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner the maximum noise levels at affected properties will not exceed those listed in the following schedule: (see Table E for Residential Properties)

Table E – City of Lake Elsinore Construction Noise Standards at Residential Properties

Time Interval	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas Semi-Residential/ Commercial
Mobile Equipment			
Daily, except Sundays and Legal Holidays 7:00 a.m. to 7:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and Legal Holidays	60 dBA	65 dBA	70 dBA
Stationary Equipment			
Daily, except Sundays and Legal Holidays 7:00 a.m. to 7:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and Legal Holidays	50 dBA	55 dBA	60 dBA

Source: City of Lake Elsinore Municipal Code Section 17.176.080.

AT BUSINESS PROPERTIES:

Mobile Equipment

Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment:

Daily, including Sundays and Legal Holidays, all hours: maximum of 85 dBA.

Stationary Equipment

Maximum noise levels for repetitive scheduled and relatively long-term operation of stationary equipment:

Daily, including Sundays and Legal Holidays, all hours: maximum of 75 dBA.

3. All mobile or stationary internal combustion engine powered equipment or machinery shall be equipped with suitable exhaust and air intake silencers in proper working order.

G. Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet (46 meters) from the source if on public space or public right-of-way.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise level environment, noise measurements have been taken in the vicinity of the project site. The field survey noted that noise within the area of the project site is generally characterized by vehicular traffic on Riverside Drive and Collier Avenue. The following describes the measurement procedures, measurement locations, noise measurement results, and the modeling of the existing noise environment.

5.1 Noise Measurement Equipment

The short-term noise measurements were taken using a Larson-Davis Model 831 Type 1 precision sound level meter programmed in "slow" mode to record noise levels in "A" weighted form as well as the frequency spectrum of the noise broken down into 1/3 octaves. The sound level meter and microphone were mounted on a tripod five feet above the ground and were equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The unit meets the requirements of ANSI Standard S1.4-1984 and IEC Standard 942: 1988 for Class 1 equipment. All noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

Noise Measurement Location

The noise monitoring locations were selected in order to obtain noise measurements of the current noise levels in the project study area and to provide a baseline for any potential noise impacts that may be created by development of the proposed project. The noise measurement sites were selected to provide a representative sampling of the noise levels created by nearby noise sources. Descriptions of the noise monitoring sites are provided below in Table F. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 11:34 a.m. and 12:01 p.m. on Tuesday, March 28, 2017. During the noise measurements the sky was clear, the temperature was 72 degrees Fahrenheit, the humidity was 20 percent, barometric pressure was 30 inches of mercury, and the wind was blowing around 12 miles per hour.

All traffic noise measurement durations were measured according to the standards stated in Section N-3320 of Caltrans Technical Noise Supplement (TeNS), which specifies that the measurements be a duration of at least 10 minutes and shall be continued past 10 minutes until the fluctuations in the displayed L_{eq} is less than 0.5 dBA.

5.2 Noise Measurement Results

The results of the noise level measurements are presented in Table F and the noise monitoring data printouts are included in Appendix B. Table F shows the existing noise levels in the project vicinity ranges between 57.0 dBA L_{eq} and 62.3 dBA L_{eq}.

Table F – Existing (Ambient) Noise Level Measurements

Site No.	Description	Primary Noise Source	Start Time of Measurement	Noise Level (dBA L_{eq}/L_{max})
1	Located on the project site, approximately 140 feet northwest of Riverside Drive center line and 300 feet southwest of Collier Avenue center line.	Riverside Drive	11:34 a.m.	62.3/86.0
2	Located at nearest home approximately 1,700 feet west of the project site.	Riverside Drive	11:51 a.m.	57.0/95.5

Source: Noise measurements taken with a Larson Davis Model 831 Type 1 precision sound level meter on Tuesday, March 28, 2017.

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Construction Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table G below provides a list of the construction equipment anticipated to be used for each phase of construction as detailed in *Air Quality and Greenhouse Gas Emissions Impact Analysis Kassab Travel Center Project*, prepared by Vista Environmental, Revised September 25, 2018.

Table G – Construction Equipment Noise Emissions and Usage Factors

Equipment Description	Number of Equipment	Acoustical Use Factor[1] (percent)	Spec 721.560 Lmax at 50 feet[2] (dBA, slow[3])	Actual Measured Lmax at 50 feet[4] (dBA, slow[3])
Site Preparation				
Grader	1	40	85	83
Scraper	1	40	85	84
Tractor, Loader or Backhoe[5]	1	40	84	N/A
Grading				
Grader	1	40	85	83
Rubber Tired Dozer	1	40	85	82
Tractor, Loader or Backhoe[5]	2	40	84	N/A
Building Construction				
Crane	1	16	85	81
Forklift (Gradall)	2	40	85	83
Generator	1	50	82	81
Welder	2	40	73	74
Tractor, Loader or Backhoe[5]	1	40	84	N/A
Paving				
Cement & Mortar Mixer	1	40	85	79
Paver	2	50	85	77
Paving Equipment	2	50	85	77
Roller	2	20	85	80
Architectural Coating				
Air Compressor	1	40	80	78

Notes:
[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
[2] Spec 721.560 is the equipment noise level utilized by the RCNM program.
[3] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[4] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
[5] For the tractor/loader/backhoe, the tractor noise level was utilized, since it is the loudest of the three types of equipment.
Source: Federal Highway Administration, 2006 and CalEEMod default equipment mix.

Table G also shows the associated measured noise emissions for each piece of equipment from the RCNM model and measured percentage of typical equipment use per day. Construction noise impacts to the nearby sensitive receptors have been calculated according to the equipment noise levels and usage factors listed in Table G and through use of the RCNM. For each phase of construction, the nearest piece

of equipment was placed at the shortest distance of the proposed activity to the nearest sensitive receptor and each subsequent piece of equipment was placed an additional 50 feet away

6.2 Operations-Related Noise

The proposed project would result in increases in traffic noise to the nearby roadways as well as introduce new sensitive receptors to the project site. The project noise impacts to the offsite roadways were analyzed through use of the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108 (FHWA Model). The following section provides a discussion of the software and modeling input parameters used in this analysis and a discussion of the resultant existing noise model.

FHWA Model Methodology

In order to quantify the potential noise impacts created by vehicular traffic generated by the proposed project and compare them to the without project noise levels, the roadway noise environment was modeled using the FHWA Model. The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the reference energy mean emission level to account for: the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT) and the percentage of ADT which flows during the day, evening and night, the travel speed, the vehicle mix on the roadway, which is a percentage of the volume of automobiles, medium trucks and heavy trucks, the roadway grade, the angle of view of the observer exposed to the roadway and site conditions ("hard" or "soft" relates to the absorption of the ground, pavement or landscaping). The following section provides a discussion of the software and modeling input parameters used in this analysis and a discussion of the resultant existing noise model.

FHWA Model Traffic Noise Prediction Model Inputs

The roadway parameters used for this study are presented in Table H. The roadway classifications are based on the City's General Plan Circulation Element. The roadway speeds are based on the posted speed limits. The distance to the nearest sensitive receptor was determined by measuring the distance from the roadway centerline to the nearest residence. Since the study area is located in a suburban environment and landscaping or natural vegetation exists along the sides of all analyzed roadways, soft site conditions were modeled.

Table H – FHWA Model Roadway Parameters

Roadway	Segment	General Plan Classification	Vehicle Speed (MPH)	Distance to Nearest Receptor[1] (feet)
Central Avenue (SR-74)	East of Dexter Avenue	Augmented Urban Arterial	55	70
Riverside Drive (SR-74)	West of Gunnerson Street – Strickland Avenue	Urban Arterial	40	60
Riverside Drive (SR-74)	East of Lakeshore Drive	Urban Arterial	40	60
Riverside Drive (SR-74)	West of Lakeshore Drive	Urban Arterial	40	55
Lakeshore Drive	North of Riverside Drive (SR-74)	Urban Arterial	40	60
Lakeshore Drive	South of Riverside Drive (SR-74)	Urban Arterial	40	140

Notes:
[1] Distance measured from nearest structure to centerline of roadway.
Source: Dudek, 2018; and City of Lake Elsinore, 2011.

The existing and the existing plus ambient plus cumulative without project and with project average daily traffic (ADT) volumes on the study area roadways were obtained from the *Traffic Impact Study Kassab Travel Center, City of Lake Elsinore, CA*, prepared by prepared by Dudek, revised August 31, 2018. The existing plus ambient and cumulative ADT volumes were calculated based on the existing plus ambient plus cumulative volumes. The ADT volumes were calculated by multiplying the PM peak hour volumes by 12. The ADT volumes have been provided for both without the project and with project conditions for the existing, existing plus ambient, and cumulative scenarios. The ADT volumes used in this analysis are shown in Table I.

Table I – Average Daily Traffic Volumes

		Average Daily Traffic Volumes					
Roadway	**Segment**	**Existing**	**Existing + Project**	**Existing + Ambient**	**Existing + Ambient + Project**	**Cumulative**	**Cumulative + Project**
Central Avenue (SR-74)	East of Dexter Avenue	41,100	41,360	45,590	45,850	62,140	62,400
Riverside Drive (SR-74)	West of Gunnerson Street – Strickland Avenue	21,020	21,290	21,890	22,160	31,270	31,540
Riverside Drive (SR-74)	East of Lakeshore Drive	21,050	21,310	21,930	22,190	31,350	31,610
Riverside Drive (SR-74)	West of Lakeshore Drive	24,180	24,300	25,190	25,310	29,840	29,960
Lakeshore Drive	North of Riverside Drive (SR-74)	14,760	16,920	15,480	17,640	17,900	20,060
Lakeshore Drive	South of Riverside Drive (SR-74)	13,760	13,860	14,350	14,450	16,810	16,910

Source: Dudek, 2018; and City of Lake Elsinore, 2011.

The vehicle mix used in the FHWA-RD-77-108 Model is shown in Table J. the State Route 74 distribution was obtained from the *2015 Annual Average Daily Truck Traffic on the California State Highway System* (Caltrans, 2016) for State Route 74 west of Interstate 15, which is the nearest available measured vehicle mix to the project site. The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks, and heavy trucks for input into the FHWA model.

Table J – Roadway Vehicle Mix

	Traffic Flow Distributions			
Vehicle Type	**Day (7 a.m. to 7 p.m.)**	**Evening (7 p.m. to 10 p.m.)**	**Night (10 p.m. to 7 a.m.)**	**Overall**
Automobiles	62.99%	12.91%	15.10%	91.00%
Medium Trucks	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	1.47%	0.14%	1.08%	2.69%

Source: Caltrans, 2016.

FHWA Model Source Assumptions

To assess the roadway noise generation in a uniform manner, all vehicles are analyzed at the single lane equivalent acoustic center of the roadway being analyzed. In order to determine the height above the road grade where the noise is being emitted from, each type of vehicle has been analyzed independently with autos at road grade, medium trucks at 2.3 feet above road grade, and heavy trucks at 8 feet above road grade. These elevations were determined through a noise-weighted average of the elevation of the exhaust pipe, tires and mechanical parts in the engine, which are the primary noise emitters from a vehicle.

6.3 Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table K gives approximate vibration levels for particular construction activities. The data in Table K provides a reasonable estimate for a wide range of soil conditions.

Table K – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L_v)at 25 feet
Pile driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, May 2006.

The construction-related and operational vibration impacts have been calculated through the vibration levels shown above in Table K and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table G.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the proposed project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above noise levels existing without the proposed project; or
- Exposure of persons residing or working in the project area to excessive noise levels from aircraft.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not expose persons to or generate noise levels in excess of standards established in the General Plan or Noise Ordinance or applicable standards of other agencies. The following section calculates the potential noise emissions associated with the construction and operations of the proposed project and compares the noise levels to the City standards.

Construction-Related Noise

The construction activities for the proposed project are anticipated to include site preparation and grading of the 2.84-acre project site, building construction of the 18-pump, 6,092 square foot gas station, 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive-thru window, paving of the onsite roads an parking areas, and application of architectural coatings. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are offsite workers at the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet southwest of the project site.

Section 17.176.080(F)(1) of the City's Municipal Code restricts construction activities from occurring between the weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on weekends or holidays. Section 17.176.080(F)(2) of the City's Municipal Code limits construction noise that occurs at the nearby business uses to 85 dBA from mobile equipment and 75 dBA from stationary equipment and at the nearby single-family homes to 75 dBA for mobile equipment and 60 dBA for stationary equipment.

Construction noise impacts to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table G – Construction Equipment Noise Emissions and Usage Factors. The results are shown below in Table L and the RCNM printouts are provided in Appendix C.

Table L – Worst Case Construction Noise Levels at Nearest Receptors

Construction Phase	Off-Site Workers to Northwest[1]		Single-Family Homes to Southwest[2]	
	Distance (feet)	Noise Level (dBA Leq)[3]	Distance (feet)	Noise Level (dBA Leq)[3]
Site Preparation	100	**77**	1,700	54
Grading	100	**77**	1,700	55
Building Construction	131	72	1,720	54
Paving	106	72	1,706	52
Painting	131	65	1,720	43
City's Mobile Equipment Threshold		**85**		**75**
City's Stationary Equipment Threshold		**75**		**60**

Notes:
[1] Off-Site Worker noise threshold from Section17.176.080(F)(2) of the Municipal Code for Business Properties.
[1] City construction noise threshold from Section 17.176.080(F)(2) of the Municipal Code for Type I Areas.
Source: RCNM, Federal Highway Administration, 2006

Table L shows that the greatest noise impacts at the nearby off-site workers would occur during the site preparation and grading phases of construction, with a noise level as high as 77 dBA, which is within the City's mobile equipment threshold for business properties of 85 dBA. However, the site preparation and grading phases have the potential to exceed the City's stationary equipment threshold of 75 dBA at the nearest off-site workers. This would be considered a significant impact.

Table L also shows that the greatest noise impacts at the nearest home would occur during grading, with a noise level as high as 55 dBA, which is within both the City's mobile equipment threshold of 75 dBA and stationary equipment threshold of 60 dBA.

Mitigation Measure 1 is provided that would require any stationary construction equipment that is used within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and nearby sensitive receptors. With implementation of Mitigation Measure 1, construction-related noise impacts would be reduced to within the City noise standards.

Operational-Related Noise

The operation of the proposed project may generate onsite noise levels that exceed City standards at the existing nearby sensitive receptors. The operation of the proposed project may create an increase in onsite noise levels from rooftop mechanical equipment, air/water machine, gas fueling activities, parking lot activities, delivery truck activities, and onsite operation of a drive-thru speaker.

Section 17.176.060(A) of the Municipal Code limits onsite noise sources to 65 dBA between 7:00 a.m. and 10:00 p.m. and 60 dBA between 10:00 p.m. and 7:00 a.m. at the adjacent existing commercial property on the northwest side and the proposed commercial property on the southwest side of the project site. Section 8.06.060(A) also provides residential noise standards, however the nearest residential uses are located 1,700 feet to the southwest and due to the distance, no noise impacts are anticipated to the nearby residential uses.

In order to determine the noise impacts from rooftop mechanical equipment, parking lot activities, delivery truck activities, air/water machine, gas fueling activities, and drive thru speakers, reference noise measurements were taken of each noise source and are shown below in Table M. Table M also shows the anticipated noise level from each source at the nearest offsite receptors. The onsite noise source calculations and operational reference noise measurements are shown in Appendix D.

Table M – Operational Noise Levels at the Nearby Commercial Uses Prior to Mitigation

	Reference Noise Measurements		Noise Levels at Northwest Property Line		Noise Levels at Southwest Property Line	
Noise Source	Distance of Measurement (feet)	Noise Level (dBA L_{eq})	Distance Receptor to Source (feet)	Noise Level[1] (dBA L_{eq})	Distance Receptor to Source (feet)	Noise Level (dBA L_{eq})
Rooftop Equipment	10	66.6	55	52	25	59
Parking Lot	5	63.1	6	62	6	62
Truck Delivery	30	54.8	6	69	80	46
Air/Water	5	66.9	3	71	135	38
Fueling Pumps	10	61.7	105	41	145	38
Drive Thru Speaker	10	61.2	90	42	30	52
Combined Noise Levels				**74**		**64**
City Noise Standards (Day/Night)[1]				**65/60**		**65/60**
Exceed City Standards (Day/Night)?				**Yes/Yes**		**No/Yes**

Notes:
[1] City noise standards from Section 17.176.060(A)(1) of the Municipal Code.
Source: Noise calculation methodology from Caltrans, 2013.

Table M shows that the combined noise levels at the adjacent commercial uses would be 74 dBA at the northwest property line and would be 64 dBA at the southwest property line, which are based on the worst-case scenario of the simultaneous occurrence of all noise producing activities from operation of the proposed project. Table M shows that the combined noise levels would exceed the City's commercial land use daytime noise standard of 65 dBA on the northwest property line and would exceed the commercial use nighttime noise standard of 60 dBA at both the northwest and southwest property lines. This would be considered a significant impact.

Mitigation Measure 2 is provided that would require the project applicant to construct a minimum 8-foot high masonry wall on the northwest and southwest property lines of the project site. The operational onsite noise levels were recalculated based on implementation of Mitigation Measure 2 and the results are shown in Table N. Table N shows that with implementation of Mitigation Measure 2, the combined noise levels at the adjacent commercial uses would be 58 dBA at the northwest property line and would be 51 dBA at the southwest property line, which are within both the City's daytime and nighttime noise standards for commercial land uses. With implementation of Mitigation Measure 2, operational-related noise impacts would be reduced to within the City noise standards.

Therefore, with implementation of Mitigation Measures 1 and 2, the proposed project would not expose persons to noise levels in excess of standards established in the local general plan or noise ordinance.

Table N – Mitigated Operational Noise Levels at the Nearby Commercial Uses

Noise Source	Reference Noise Measurements: Distance of Measurement (feet)	Reference Noise Measurements: Noise Level (dBA L_{eq})	Noise Levels at Northwest Property Line: Distance Receptor to Source (feet)	Noise Levels at Northwest Property Line: Noise Level[1] (dBA L_{eq})	Noise Levels at Southwest Property Line: Distance Receptor to Source (feet)	Noise Levels at Southwest Property Line: Noise Level[1] (dBA L_{eq})
Rooftop Equipment	10	66.6	55	47	25	48
Parking Lot	5	63.1	6	46	6	46
Truck Delivery	30	54.8	6	55	80	35
Air/Water	5	66.9	3	54	135	27
Fueling Pumps	10	61.7	105	30	145	27
Drive Thru Speaker	10	61.2	90	31	30	40
Combined Noise Levels				**58**		**51**
City Noise Standards (Day/Night)[2]				**65/60**		**65/60**
Exceed City Standards (Day/Night)?				**No/No**		**No/No**

Notes:
[1] Calculated noise level includes attenuation provided by the 8-foot high wall required per Mitigation Measure 2.
[2] City noise standards from Section 17.176.060(A)(1) of the Municipal Code.
Source: Noise calculation methodology from Caltrans, 2013.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 1:

The project applicant shall require any construction contractor that needs to use stationary construction equipment within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and nearest sensitive receptors.

Mitigation Measure 2:

The project applicant shall construct a minimum 8-foot high masonry wall that is free of cutouts or openings along the northwest and southwest property lines of the project site. The portions of the walls that are within the setbacks of Riverside Drive and Collier Avenue shall be limited to 3 feet in height per the wall height limitations detailed in Sections 17.112.070 and 17.112.090 of the City of Lake Elsinore Municipal Code.

Level of Significance After Mitigation

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. The following section analyzes the potential vibration impacts associated with the construction and operations of the proposed project.

Construction-Related Vibration Impacts

The construction activities for the proposed project are anticipated to include site preparation and grading of the 2.84-acre project site, building construction of the 18-pump, 6,092 square foot gas station, 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive-thru window,

paving of the onsite roads an parking areas, and application of architectural coatings. The nearest off-site receptors to the project site are the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet west of the project site.

Section 17.176.080(G) of the City's Municipal Code restricts the operation of any device that creates a vibration which is above the vibration threshold of any individual at or beyond the property boundary of the source. Since the City's Municipal does not provide a quantifiable vibration level, Caltrans guidance that is detailed above in Section 4.2 has been utilized, which defines the threshold of perception from transient sources at 0.25 inch per second PPV.

The primary source of vibration during construction would be from the operation of a bulldozer. From Table K above a large bulldozer would create a vibration level of 0.089 inch per second PPV at 25 feet. Based on typical propagation rates, the vibration level at the nearest offsite receptor (100 feet away) would be 0.02 inch per second PPV. The vibration level at the nearest offsite receptor would be within the 0.25 inch per second PPV threshold detailed above. Impacts would be less than significant.

Operations-Related Vibration Impacts

The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast food restaurant with a drive-thru window, and a parking lot. The proposed project would result in the operation of semi-trucks on the project site, which are a known source of vibration. The nearest off-site receptors to the proposed project are offsite workers located as near as 106 feet from where trucks could potentially operate on the project site.

Section 17.176.080 of the City's Municipal Code limits vibration activities to vibration levels that are not above an individual person's vibration threshold at or beyond the property boundary where the source is located. Since the onsite operation of semi-truck has the potential to create groundborne vibration that may expose persons to excessive vibration levels. In order to provide a conservative analysis, the operational activities have been analyzed based on the standard of being discernable at the nearest offsite workers, which are located as near as 80 feet from where a truck may operate onsite.

Caltrans has done extensive research on vibration level created along freeways and State Routes and their vibration measurements of roads have never exceeded 0.08 inches per second PPV at 15 feet from the center of the nearest lane, with the worst combinations of heavy trucks. Truck activities would occur onsite as near as 80 feet from the nearest off-site worker. Based on typical propagation rates, the vibration level at the nearest offsite worker would by 0.01 inch per second PPV. Caltrans research found that human response to transient sources becomes distinctly perceptible at 0.25 inch per second PPV. Therefore, vibration created from operation of the proposed project would be below the threshold of perception at the nearest offsite worker. Impacts would be less than significant.

Level of Significance

Less than significant impact.

7.4 Permanent Noise Level Increase

The ongoing operation of the proposed project may result in a potential substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the proposed project. Potential noise impacts associated with the operations of the proposed project would be from project-generated vehicular traffic on the nearby roadways and from onsite activities, which have been analyzed separately below.

Roadway Vehicular Noise

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project does not propose any uses that would require a substantial number of truck trips and the proposed project would not alter the speed limit on any existing roadway so the proposed project's potential offsite noise impacts have been focused on the noise impacts associated with the change of volume of traffic that would occur with development of the proposed project.

Neither the General Plan nor the CEQA Guidelines define what constitutes a "substantial permanent increase to ambient noise levels", as such, this impact analysis has utilized guidance from the Federal Transit Administration for a moderate impact that has been detailed above in Table A.

The potential offsite traffic noise impacts created by the on-going operations of the proposed project have been analyzed through utilization of the FHWA model and parameters described above in Section 6.2 and the FHWA model noise calculation spreadsheets are provided in Appendix E. The proposed project's offsite traffic noise impacts have been analyzed for the existing, existing plus ambient, and cumulative conditions and are discussed below.

Existing Conditions

The proposed project's potential offsite noise impacts have been calculated through a comparison of the Existing scenario to the Existing With Project Scenario. The results of this comparison are shown in Table O.

Table O – Existing Year Project Traffic Noise Contributions

		dBA Ldn at Nearest Receptor[1]			
Roadway	Segment	Existing	Existing With Project	Project Contribution	Increase Threshold
Central Avenue (SR-74)	East of Dexter Avenue	74.3	74.3	0.0	+1 dBA
Riverside Drive (SR-74)	West of Gunnerson Street-Strickland Avenue	68.3	68.4	0.1	+1 dBA
Riverside Drive (SR-74)	East of Lakeshore Drive	68.3	68.4	0.1	+1 dBA
Riverside Drive (SR-74)	West of Lakeshore Drive	70.0	70.0	0.0	+1 dBA
Lakeshore Drive	Northwest of Riverside Drive (SR-74)	66.8	67.4	0.6	+1 dBA
Lakeshore Drive	Southeast of Riverside Drive (SR-74)	58.9	58.9	0.0	+3 dBA

Notes:
[1] Distances to nearest residential uses are shown in Table H. The calculated noise levels do not take into account existing noise barriers
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table O shows that for the existing conditions, the proposed project's permanent noise increases to the nearby sensitive receptors from the generation of additional vehicular traffic would not exceed the FTA's allowable increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the existing conditions. Impacts would be less than significant.

Existing Plus Ambient Conditions

The proposed project's potential offsite noise impacts have been calculated through a comparison of the existing plus ambient without project scenario to the existing plus ambient with project scenario. The results of this comparison are shown in Table P.

Table P – Existing Plus Ambient Project Traffic Noise Contributions

		dBA Ldn at Nearest Receptor[1]			
Roadway	Segment	Existing + Ambient	Existing + Ambient + Project	Project Contribution	Increase Threshold
Central Avenue (SR-74)	East of Dexter Avenue	74.6	74.6	0.0	+1 dBA
Riverside Drive (SR-74)	West of Gunnerson Street-Strickland Avenue	68.5	68.5	0.0	+1 dBA
Riverside Drive (SR-74)	East of Lakeshore Drive	68.5	68.5	0.0	+1 dBA
Riverside Drive (SR-74)	West of Lakeshore Drive	70.1	70.2	0.1	+1 dBA
Lakeshore Drive	Northwest of Riverside Drive (SR-74)	67.0	67.5	0.5	+1 dBA
Lakeshore Drive	Southeast of Riverside Drive (SR-74)	59.1	59.1	0.0	+3 dBA

Notes:
[1] Distances to nearest residential uses are shown in Table H. The calculated noise levels do not take into account existing noise barriers.
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table P shows that for the existing plus ambient conditions, the proposed project's permanent noise increases to the nearby sensitive receptors from the generation of additional vehicular traffic would not exceed the FTA's allowable increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the existing plus ambient conditions. Impacts would be less than significant.

Cumulative Conditions

The proposed project's potential offsite noise impacts have been calculated through a comparison of the cumulative without project scenario to the cumulative with project scenario. The results of this comparison are shown in Table Q.

Table Q – Cumulative Project Traffic Noise Contributions

		dBA Ldn at Nearest Receptor[1]			
Roadway	Segment	Cumulative No Project	Cumulative With Project	Project Contribution	Increase Threshold
Central Avenue (SR-74)	East of Dexter Avenue	76.1	76.1	0.0	+0 dBA
Riverside Drive (SR-74)	West of Gunnerson Street-Strickland Avenue	70.0	70.1	0.1	+1 dBA
Riverside Drive (SR-74)	East of Lakeshore Drive	70.0	70.1	0.1	+1 dBA
Riverside Drive (SR-74)	West of Lakeshore Drive	70.9	70.9	0.0	+1 dBA
Lakeshore Drive	Northwest of Riverside Drive (SR-74)	67.6	68.1	0.5	+1 dBA
Lakeshore Drive	Southeast of Riverside Drive (SR-74)	59.8	59.8	0.0	+3 dBA

Notes:
[1] Distances to nearest residential uses are shown in Table H. The calculated noise levels do not take into account existing noise barriers
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table Q shows that for the cumulative conditions, the proposed project's permanent noise increases to the nearby sensitive receptors from the generation of additional vehicular traffic would not exceed the FTA's allowable increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the cumulative conditions. Impacts would be less than significant.

Onsite Noise Sources

The proposed project would consist of the development of an 18-pump gas station and associated convenience store, a fast food restaurant with a drive-thru window, and a parking lot. The operation of the proposed project may create an increase in onsite noise levels from noise impacts from rooftop mechanical equipment, air/water machine, gas fueling activities, parking lot activities, delivery truck activities, and onsite operation of a drive-thru speaker.

Section 17.176.060(A) of the Municipal Code limits onsite noise sources to 65 dBA between 7:00 a.m. and 10:00 p.m. and 60 dBA between 10:00 p.m. and 7:00 a.m. at the adjacent existing commercial property on the northwest side and the proposed commercial property on the southwest side of the project site. Section 8.06.060(A) also provides residential noise standards, however the nearest residential uses are located 1,700 feet to the southwest and due to the distance, no noise impacts are anticipated to the nearby residential uses.

The analysis provided above in Section 7.2 found that the noise levels from onsite noise sources at the adjacent commercial uses would be 74 dBA at the northwest property line and would be 64 dBA at the southwest property line, which are based on the worst-case scenario of the simultaneous occurrence of all noise producing activities from operation of the proposed project. The analysis provided in Section 7.2 shows that the combined noise levels would exceed the City's commercial land use daytime noise standard of 65 dBA on the northwest property line and would exceed the commercial use nighttime noise standard of 60 dBA at both the northwest and southwest property lines. This would be considered a significant impact.

Mitigation Measure 2 is provided that would require the project applicant to construct a minimum 8-foot high masonry wall on the northwest and southwest property lines of the project site. The operational onsite noise levels were recalculated based on implementation of Mitigation Measure 2 and the results are shown above in Section 7.2, which shows that with implementation of Mitigation Measure 2, the combined noise levels at the adjacent commercial uses would be 58 dBA at the northwest property line and would be 51 dBA at the southwest property line, which are within both the City's daytime and nighttime noise standards for commercial land uses. Therefore, with implementation of Mitigation Measure 2, the proposed project is not anticipated to cause a substantial permanent increase in ambient noise levels from onsite sources. Impacts would be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 2 provided above in Section 7.2.

Level of Significance After Mitigation

Less than significant impact.

7.5 Temporary Noise Level Increase

The proposed project may create a substantial temporary or periodic increase in ambient noise levels in the project vicinity above noise levels existing without the proposed project. The construction activities for the proposed project are anticipated to include site preparation and grading of the 2.84-acre project site, building construction of the 18-pump, 6,092 square foot gas station, 8,360 square foot convenience store, and a 2,543 square foot fast food restaurant with a drive-thru window, paving of the onsite roads and parking areas, and application of architectural coatings. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are the commercial uses located as near as 100 feet northwest of the project site. There are also single-family homes located as near as 1,700 feet southwest of the project site.

The construction noise impacts to the nearby sensitive receptors has been previously analyzed above in Section 7.2, which found that that the greatest noise impacts at the nearby off-site workers would occur during the site preparation and grading phases of construction, with a noise level as high as 77 dBA, which is within the City's mobile equipment threshold for business properties of 85 dBA. However, the site preparation and grading phases have the potential to exceed the City's stationary equipment threshold of 75 dBA at the nearest off-site workers. This would be considered a significant impact.

Section 7.2 also shows that the greatest noise impacts at the nearest homes would occur during grading of the project site, with a noise level as high as 55 dBA, which is within both the City's mobile equipment threshold of 75 dBA and stationary equipment threshold of 60 dBA.

Mitigation Measure 1 is provided that would require any stationary construction equipment that is used within 50 feet of the project's northwest property line to place a temporary sound barrier between the stationary equipment and any nearby sensitive receptors. With implementation of Mitigation Measure 1, the proposed project would not create a substantial temporary or periodic increase in ambient noise levels.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 1 provided above in Section 7.2.

Level of Significance After Mitigation

Less than significant impact.

7.6 Aircraft Noise

The proposed project would not expose people residing or working in the project area to excessive noise levels from aircraft. The nearest airport is Skylark Airport, located approximately five miles southeast of the project site. The project site is located outside of the 60 dBA CNEL noise contours of this airport and the site observations during the noise measurements found that although aircraft noise is occasionally audible at the project site, the noise created by the aircraft is not loud enough to measurably increase the

ambient noise levels, which is primarily created by Riverside Drive and Collier Avenue. Impacts would be less than significant.

Level of Significance

Less than significant impact.

8.0 REFERENCES

California Department of Transportation, *2015 Annual Average Daily Truck Traffic on the California State Highway System*, 2016.

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

California Department of Transportation, *Transportation- and Construction-Induced Vibration Guidance Manual*, September 2013.

City of Lake Elsinore, *City of Lake Elsinore General Plan*, December 13, 2011.

City of Lake Elsinore, *City of Lake Elsinore General Plan Update Final Recirculated Program Environmental Impact Report*, December 13, 2011.

City of Lake Elsinore, *Lake Elsinore Municipal Code,* February 24, 2015.

Dudek, *Traffic Impact Study Kassab Travel Center, City of Lake Elsinore,* revised August 31, 2018.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* May 2006.

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide,* January, 2006.

Vista Environmental, *Air Quality and Greenhouse Gas Emissions Impact Analysis Kassab Travel Center Project, City of Lake Elsinore,* revised September 26, 2018.

APPENDIX A

Study Area Photo Index

Noise Measurement Site A - Looking North

Noise Measurement Site A - Looking Northeast

Noise Measurement Site A - Looking East

Noise Measurement Site A - Looking Southeast

Noise Measurement Site A - Looking South

Noise Measurement Site A - Southwest

Noise Measurement Site A - Looking West

Noise Measurement Site A - Looking Northwest

Noise Measurement Site B - Looking North

Noise Measurement Site B - Looking Northeast

Noise Measurement Site B - Looking East

Noise Measurement Site B - Looking Southeast

Noise Measurement Site B - Looking South

Noise Measurement Site B - Looking Southwest

Noise Measurement Site B - Looking West

Noise Measurement Site B - Looking Northwest

APPENDIX B

Field Noise Measurement Printouts

General Information

Serial Number	02509
Model	831
Firmware Version	2.301
Filename	831_Data.008
User	GT
Job Description	Lake Elsinore Tige Water Sports
Location	At Project Site Approx 110' NW of Riverside Dr, 350' SW of Collie
Measurement Description	
Start Time	Tuesday, 2017 March 28 11:34:21
Stop Time	Tuesday, 2017 March 28 11:44:21
Duration	00:10:00.7
Run Time	00:10:00.7
Pause	00:00:00.0
Pre Calibration	Tuesday, 2017 March 28 11:12:45
Post Calibration	None
Calibration Deviation	---

Note

Noise from vehicles on Riversie Dr, Collier Ave, and Interstate 15
72F, 28.67 in Hg, 22% Hu, 10 mph wind, clear sky

Overall Data

LAeq		62.3	dB
LASmax	2017 Mar 28 11:40:26	72.6	dB
LApeak (max)	2017 Mar 28 11:40:26	86.0	dB
LASmin	2017 Mar 28 11:39:59	54.0	dB
LCeq		73.8	dB
LAeq		62.3	dB
LCeq - LAeq		11.5	dB
LAIeq		63.4	dB
LAeq		62.3	dB
LAIeq - LAeq		1.1	dB
Ldn		62.3	dB
LDay 07:00-23:00		62.3	dB
LNight 23:00-07:00		---	dB
Lden		62.3	dB
LDay 07:00-19:00		62.3	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		90.1	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00		67.1	dBA
LAS10.00		64.4	dBA
LAS33.30		61.5	dBA
LAS50.00		60.4	dBA
LAS66.60		59.5	dBA
LAS90.00		57.5	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)		9 / 69.4	s
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.8	dB
Noise Floor	17.0	dB
Overload	143.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	78.6	73.7	68.5	67.1	68.9	64.0	59.4	58.5	48.9	40.5	40.3	42.9
LZSmax	89.7	86.3	79.0	79.1	81.7	79.8	73.1	68.6	60.7	55.7	55.0	45.8
LZSmin	52.5	59.1	57.5	55.5	54.5	47.9	50.7	51.9	41.4	36.2	39.3	42.8

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	75.3	73.7	72.0	70.5	68.6	67.1	65.1	63.4	62.3	61.5	62.7	62.8
LZSmax	87.2	85.3	83.0	82.7	82.7	79.3	75.6	75.1	74.0	72.0	72.4	79.1
LZSmin	44.4	48.6	47.7	52.8	53.4	53.5	49.9	52.6	52.1	51.5	52.8	51.7

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	63.8	66.4	60.1	62.2	57.1	55.9	54.8	54.7	54.6	55.3	54.0	50.9
LZSmax	77.7	81.7	76.5	79.7	73.2	74.4	71.0	68.7	65.5	65.1	66.0	61.8
LZSmin	50.6	48.8	45.3	44.6	42.2	41.0	42.7	46.4	46.3	47.7	47.7	44.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	47.0	42.4	39.7	37.0	35.2	34.4	34.5	35.2	36.7	37.0	37.9	39.5
LZSmax	57.5	55.2	54.6	52.5	50.7	48.8	48.4	47.6	52.9	41.3	40.3	41.5
LZSmin	39.7	34.5	30.9	30.6	31.1	31.6	32.9	34.4	34.7	36.7	37.7	38.4

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	28 Mar 2017 11:12:45	-25.8
PRM831	02 Nov 2016 10:44:45	-25.2
PRM831	22 Sep 2016 15:49:59	-26.5
PRM831	24 Aug 2016 19:03:10	-26.1
PRM831	26 Jul 2016 10:53:46	-26.0
PRM831	26 Jul 2016 09:33:01	-26.4
PRM831	26 Jul 2016 07:41:35	-25.1
PRM831	25 Jul 2016 14:18:53	-26.4
PRM831	25 Jul 2016 12:49:23	-25.2
PRM831	25 Jul 2016 09:43:52	-24.8
PRM831	25 Jul 2016 07:24:48	-25.6

General Information

Serial Number	02509
Model	831
Firmware Version	2.301
Filename	831_Data.009
User	GT
Job Description	Lake Elsinore Tige Water Sports
Location	At Nearest Home approx 1,500 ft west of Project
Measurement Description	
Start Time	Tuesday, 2017 March 28 11:51:44
Stop Time	Tuesday, 2017 March 28 12:01:55
Duration	00:10:11.4
Run Time	00:10:11.4
Pause	00:00:00.0
Pre Calibration	Tuesday, 2017 March 28 11:12:45
Post Calibration	None
Calibration Deviation	---

Note

Located approx 25' SW of Baker St CL and 15' NW of Turnbull Ave
Noise primmarily from Interstate 15
72 F, 28.67 in Hg, 22% Hu, 10 mph wind, clear sky

Overall Data

LAeq		57.0	dB
LASmax	2017 Mar 28 11:53:59	75.5	dB
LApeak (max)	2017 Mar 28 11:53:58	95.5	dB
LASmin	2017 Mar 28 11:59:27	47.9	dB
LCeq		69.2	dB
LAeq		57.0	dB
LCeq - LAeq		12.2	dB
LAIeq		60.8	dB
LAeq		57.0	dB
LAIeq - LAeq		3.8	dB
Ldn		57.0	dB
LDay 07:00-23:00		57.0	dB
LNight 23:00-07:00		---	dB
Lden		57.0	dB
LDay 07:00-19:00		57.0	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		84.8	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	61.6	dBA
LAS10.00	58.9	dBA
LAS33.30	52.5	dBA
LAS50.00	51.4	dBA
LAS66.60	50.8	dBA
LAS90.00	50.0	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	3 / 18.1	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.8	dB
Noise Floor	17.0	dB
Overload	143.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	76.9	70.9	64.7	61.2	63.6	57.7	54.9	51.1	46.6	43.0	40.7	43.0
LZSmax	92.8	86.1	78.0	73.7	83.7	78.8	74.1	68.8	64.3	60.2	53.9	45.7
LZSmin	53.1	57.3	54.2	52.8	47.0	42.8	46.2	44.6	36.4	36.6	39.4	42.3

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	74.3	71.3	69.7	67.5	66.0	64.3	61.7	59.3	57.5	55.8	56.4	57.1
LZSmax	90.9	86.7	84.5	84.0	80.9	79.8	76.3	73.4	71.6	69.6	71.3	72.6
LZSmin	44.8	44.7	48.8	53.3	49.4	50.2	49.4	48.9	48.3	42.5	47.2	38.2

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	56.6	59.5	59.9	53.0	53.0	52.3	51.4	50.4	48.5	47.9	46.3	44.2
LZSmax	73.8	77.9	82.2	74.5	73.5	73.5	72.2	69.0	64.5	66.3	63.9	60.5
LZSmin	41.2	41.1	38.4	36.9	37.7	32.0	40.3	42.1	41.4	41.3	40.0	36.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	42.9	41.6	40.7	39.7	38.1	36.2	35.9	35.6	36.3	37.2	37.9	39.6
LZSmax	61.0	60.4	58.5	56.7	56.6	52.1	52.8	47.8	45.9	41.7	41.3	41.2
LZSmin	32.4	30.9	30.9	31.1	31.8	32.5	33.4	34.4	35.5	36.2	37.7	38.9

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	28 Mar 2017 11:12:45	-25.8
PRM831	02 Nov 2016 10:44:45	-25.2
PRM831	22 Sep 2016 15:49:59	-26.5
PRM831	24 Aug 2016 19:03:10	-26.1
PRM831	26 Jul 2016 10:53:46	-26.0
PRM831	26 Jul 2016 09:33:01	-26.4
PRM831	26 Jul 2016 07:41:35	-25.1
PRM831	25 Jul 2016 14:18:53	-26.4
PRM831	25 Jul 2016 12:49:23	-25.2
PRM831	25 Jul 2016 09:43:52	-24.8
PRM831	25 Jul 2016 07:24:48	-25.6

APPENDIX C

RCNM Model Construction Noise Calculations

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/25/2017
Case Description: Kassab Travel Center - Site Prep

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		100	0
Scraper	No	40		83.6	150	0
Tractor	No	40	84		200	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader		79	75	N/A	N/A	N/A	N/A
Scraper		74.0	70.1	N/A	N/A	N/A	N/A
Tractor		72.0	68.0	N/A	N/A	N/A	N/A
	Total	**79**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S	Residential	57.0	57.0	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		1700	0
Scraper	No	40		83.6	1750	0
Tractor	No	40.0	84		1800	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader		54	50	N/A	N/A	N/A	N/A
Scraper		53	49	N/A	N/A	N/A	N/A
Tractor		53	49	N/A	N/A	N/A	N/A
	Total	**54**	**54**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/25/2017
Case Description: Kassab Travel Center - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to I	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		100	0
Dozer	No	40		81.7	150	0
Tractor	No	40	84		200	0
Tractor	No	40	84		250	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Grader		79.0	75.0	N/A	N/A	N/A	N/A
Dozer		72.1	68.1	N/A	N/A	N/A	N/A
Tractor		72.0	68.0	N/A	N/A	N/A	N/A
Tractor		70.0	66.0	N/A	N/A	N/A	N/A
	Total	**79**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40.0	85		1700	0
Dozer	No	40		81.7	1750	0
Tractor	No	40	84		1800	0
Tractor	No	40	84		1850	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Leq	Evening Lmax	Leq
Grader	54.4	50.4	N/A	N/A	N/A	N/A
Dozer	50.8	46.8	N/A	N/A	N/A	N/A
Tractor	52.9	48.9	N/A	N/A	N/A	N/A
Tractor	52.6	48.7	N/A	N/A	N/A	N/A
Total	**54**	**55**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/26/2017
Case Description: Kassab Travel Center - Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to N	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	131	0
Gradall	No	40		83.4	181	0
Gradall	No	40		83.4	231	0
Generator	No	50		80.6	281	0
Welder / Torch	No	40		74	331	0
Welder / Torch	No	40		74	381	0
Welder / Torch	No	40		74	431	0
Tractor	No	40	84		520	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane		72.2	64.2	N/A	N/A	N/A	N/A
Gradall		72.2	68.2	N/A	N/A	N/A	N/A
Gradall		70.1	66.1	N/A	N/A	N/A	N/A
Generator		65.6	62.6	N/A	N/A	N/A	N/A
Welder / Torch		57.6	53.6	N/A	N/A	N/A	N/A
Welder / Torch		56.4	52.4	N/A	N/A	N/A	N/A
Welder / Torch		55.3	51.3	N/A	N/A	N/A	N/A
Tractor		63.7	59.7	N/A	N/A	N/A	N/A
	Total	**72**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S\	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1720	0
Gradall	No	40		83.4	1770	0
Gradall	No	40		83.4	1820	0
Generator	No	50		80.6	1870	0
Welder / Torch	No	40		74	1920	0
Welder / Torch	No	40		74	1970	0
Welder / Torch	No	40		74	2020	0
Tractor	No	40	84		2070	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane	49.8	41.9	N/A	N/A	N/A	N/A
Gradall	52.4	48.4	N/A	N/A	N/A	N/A
Gradall	52.2	48.2	N/A	N/A	N/A	N/A
Generator	49.2	46.2	N/A	N/A	N/A	N/A
Welder / Torch	42.3	38.3	N/A	N/A	N/A	N/A
Welder / Torch	42.1	38.1	N/A	N/A	N/A	N/A
Welder / Torch	41.9	37.9	N/A	N/A	N/A	N/A
Tractor	51.7	47.7	N/A	N/A	N/A	N/A
Total	**52**	**54**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/26/2017
Case Description: Kassab Travel Center - Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to N	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	106	0
Paver	No	50		77.2	156	0
Paver	No	50		77.2	206	0
Roller	No	20		80	256	0
Roller	No	20		80	306	0
Tractor	No	40	84		356	0

	Calculated (dBA)		Results Noise Limits (dBA) Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	72.3	68.3	N/A	N/A	N/A	N/A
Paver	67.3	64.3	N/A	N/A	N/A	N/A
Paver	64.9	61.9	N/A	N/A	N/A	N/A
Roller	65.8	58.8	N/A	N/A	N/A	N/A
Roller	64.3	57.3	N/A	N/A	N/A	N/A
Tractor	67.0	63.0	N/A	N/A	N/A	N/A
Total	**72**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S\	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1706	0
Paver	No	50		77.2	1756	0
Paver	No	50		77.2	1806	0
Roller	No	20		80	1856	0
Roller	No	20		80	1906	0
Tractor	No	40	84		1956	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Concrete Mixer Truck	48.1	44.2	N/A	N/A	N/A	N/A
Paver	46.3	43.3	N/A	N/A	N/A	N/A
Paver	46.1	43.1	N/A	N/A	N/A	N/A
Roller	48.6	41.6	N/A	N/A	N/A	N/A
Roller	48.4	41.4	N/A	N/A	N/A	N/A
Tractor	52.2	48.2	N/A	N/A	N/A	N/A
Total	**52**	**52**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/26/2017
Case Description: Kassab Travel Center - Painting

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Offsite Workers to N	Commercial	62.3	62.3	62.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	131	0

Equipment		Results Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		69.3	65.3	N/A	N/A	N/A	N/A
	Total	**69**	**65**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to S	Residential	57	57	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1720	0

Equipment		Results Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		47	43	N/A	N/A	N/A	N/A
	Total	**47**	**43**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX D

Operational Reference Noise Measurements

Stationary Noise Calculations - Commercial Use Northwest of Project Site

Stationary Noise Sources	Reference Distance	Reference Leq	Northwest Property Line Distance	Leq	
					1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Rooftop HVAC	10	66.6	55	52	(eq. N-2141.2 of TeNS)
Parking Lot	5	63.1	6	62	
Truck Delivery	30	54.8	6	69	
Air/Water	5	66.9	3	71	
Gas Dispensing Facility	10	61.7	105	41	
Drive Thru Speaker	10	61.2	90	42	

Stationary Noise Sources	Distance from Receptor to Wall	Distance from source to Wall	Height of Wall (feet)	Without Wall Noise Level at Residence	With Wall Noise Level at Residence	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	Line of Sight (1=blocks line of sight)	fresnel	Barrier Atten
Rooftop HVAC	10	55	8	52	**47**	25	5	800	10.4403	57.57	68.01	0.00	1	0.0009	-4.90
Parking Lot	10	6	8	62	**46**	3	5	800	10.4403	7.81	16.12	2.13	1	6.0474	-15.92
Truck Delivery	10	6	8	69	**55**	5	5	800	10.4403	6.71	16.00	1.15	1	3.2669	-13.86
Air/Water	10	3	8	71	**54**	3	5	800	10.4403	5.83	13.15	3.12	1	8.8699	-16.86
Gas Dispensing Fa	10	105	8	41	**30**	5	5	800	10.4403	105.04	115.00	0.48	1	1.3743	-11.04
Drive Thru Speaker	10	90	8	42	**31**	5	5	800	10.4403	90.05	100.00	0.49	1	1.3946	-11.08
		Combined Noise Levels		**74**	**58**										

Stationary Noise Calculations - Commercial Use Southwest of Project Site

Stationary Noise Sources	Reference Distance	Reference Leq	Northwest Property Line Distance	Leq	
Rooftop HVAC	10	66.6	25	59	1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Parking Lot	5	63.1	6	62	(eq. N-2141.2 of TeNS)
Truck Delivery	30	54.8	80	46	
Air/Water	5	66.9	135	38	
Gas Dispensing Facility	10	61.7	145	38	
Drive Thru Speaker	10	61.2	30	52	

Stationary Noise Sources	Distance from Receptor to Wall	Distance from source to Wall	Height of Wall (feet)	Without Wall Noise Level at Residence	With Wall Noise Level at Residence	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	Line of Sight (1=blocks line of sight)	fresnel	Barrier Atten
Rooftop HVAC	10	25	8	59	**48**	25	5	800	10.4403	30.23	40.31	0.36	1	1.028	-10.34
Parking Lot	10	6	8	62	**46**	3	5	800	10.4403	7.81	16.12	2.13	1	6.047	-15.92
Truck Delivery	10	80	8	46	**35**	5	5	800	10.4403	80.06	90.00	0.50	1	1.412	-11.12
Air/Water	10	135	8	38	**27**	3	5	800	10.4403	135.09	145.01	0.52	1	1.476	-11.24
Gas Dispensing Fa	10	145	8	38	**27**	5	5	800	10.4403	145.03	155.00	0.47	1	1.341	-10.98
Drive Thru Speaker	10	30	8	52	**40**	5	5	800	10.4403	30.15	40.00	0.59	1	1.678	-11.64
		Combined Noise Levels		**64**	**51**										

General Information

Serial Number	02509
Model	831
Firmware Version	2.112
Filename	831_Data.005
User	GT
Job Description	Northwest Fresno Walmart Relocation
Location	Rooftop HVAC Unit
Measurement Description	
Start Time	Saturday, 2013 July 27 18:31:43
Stop Time	Saturday, 2013 July 27 18:41:44
Duration	00:10:01.1
Run Time	00:10:01.1
Pause	00:00:00.0
Pre Calibration	Saturday, 2013 July 27 17:53:07
Post Calibration	None
Calibration Deviation	---

Note

Located 10 feet southeast of rooftop HVAC Unit 14 located on western side of roof
94 F, 30% Hu., 29.45 in Hg, no wind, partly cloudy

Overall Data

LAeq		66.6	dB
LASmax	2013 Jul 27 18:33:16	67.6	dB
LApeak (max)	2013 Jul 27 18:32:17	81.6	dB
LASmin	2013 Jul 27 18:41:08	65.8	dB
LCeq		75.8	dB
LAeq		66.6	dB
LCeq - LAeq		9.2	dB
LAIeq		67.2	dB
LAeq		66.6	dB
LAIeq - LAeq		0.6	dB
Ldn		66.6	dB
LDay 07:00-23:00		66.6	dB
LNight 23:00-07:00		---	dB
Lden		66.6	dB
LDay 07:00-19:00		66.6	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		94.4	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	67.0	dBA
LAS10.00	66.9	dBA
LAS33.30	66.7	dBA
LAS50.00	66.6	dBA
LAS66.60	66.5	dBA
LAS90.00	66.3	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 601.1	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.8	dB
Noise Floor	17.1	dB
Overload	143.4	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	70.9	64.4	61.4	74.2	68.2	64.9	66.3	61.7	55.1	49.9	44.3	44.0
LZSmax	83.8	78.9	70.0	78.4	72.3	66.1	67.8	63.1	56.9	53.2	46.7	45.4
LZSmin	53.2	56.5	56.7	67.7	66.1	63.5	65.0	60.7	53.9	48.4	43.2	43.7

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	68.1	65.7	63.2	61.0	58.0	59.3	56.0	57.8	55.8	69.7	72.0	59.3
LZSmax	82.3	79.5	78.7	77.2	72.8	72.3	67.9	63.5	64.0	74.2	76.1	72.0
LZSmin	41.9	46.3	48.8	48.7	46.5	49.7	50.1	51.8	41.2	63.9	67.9	54.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	61.6	63.7	64.5	59.0	58.7	60.9	63.2	60.8	59.9	59.2	56.1	54.6
LZSmax	71.3	68.0	67.3	61.6	61.7	64.1	65.5	64.2	62.0	60.7	57.6	58.6
LZSmin	52.9	60.0	57.2	45.1	56.0	58.9	61.1	58.4	58.4	57.1	54.9	53.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	52.0	49.8	48.4	46.4	45.4	42.8	41.1	38.6	38.5	38.4	39.0	40.2
LZSmax	54.4	52.3	51.2	50.2	49.7	45.7	45.4	41.6	40.4	40.4	41.4	41.3
LZSmin	50.9	48.4	46.9	45.0	43.7	41.4	39.6	37.5	37.9	38.0	38.7	39.9

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	27 Jul 2013 17:53:07	-25.9
PRM831	27 Jul 2013 13:36:08	-25.6
PRM831	28 Apr 2013 15:34:24	-25.9
PRM831	23 Apr 2013 10:17:33	-25.0
PRM831	27 Feb 2013 19:15:30	-25.7
PRM831	24 Jan 2013 12:00:16	-25.6
PRM831	15 Jan 2013 07:50:44	-26.2
PRM831	04 Jan 2013 13:47:46	-26.5

General Information

Serial Number	02509
Model	831
Firmware Version	2.112
Filename	831_Data.002
User	GT
Job Description	Northwest Fresno Walmart Relocation
Location	Northwest Fresno Walmart
Measurement Description	
Start Time	Saturday, 2013 July 27 15:49:15
Stop Time	Saturday, 2013 July 27 16:09:15
Duration	00:20:00.6
Run Time	00:20:00.6
Pause	00:00:00.0
Pre Calibration	Saturday, 2013 July 27 13:36:08
Post Calibration	None
Calibration Deviation	---

Note

Located at the eastern portion of the southern parking lot and approx 140 feet south of the front door
96 F, 35% Humidity, 29.48 in Hg, 3 mph wind, partly cloudy

Overall Data

LAeq		63.1	dB
LASmax	2013 Jul 27 15:59:44	79.2	dB
LApeak (max)	2013 Jul 27 16:06:25	102.2	dB
LASmin	2013 Jul 27 15:50:20	49.6	dB
LCeq		74.0	dB
LAeq		63.1	dB
LCeq - LAeq		10.9	dB
LAIeq		67.4	dB
LAeq		63.1	dB
LAIeq - LAeq		4.3	dB
Ldn		63.1	dB
LDay 07:00-23:00		63.1	dB
LNight 23:00-07:00		---	dB
Lden		63.1	dB
LDay 07:00-19:00		63.1	dB
LEvening 19:00-23:00		---	dB
LNight 23:00-07:00		---	dB
LAE		93.9	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	66.7	dBA
LAS10.00	66.3	dBA
LAS33.30	62.8	dBA
LAS50.00	61.7	dBA
LAS66.60	57.7	dBA
LAS90.00	52.8	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	17 / 347.8	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.6	dB
Noise Floor	17.0	dB
Overload	143.1	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	66.7	66.1	71.1	71.6	64.9	59.5	59.6	58.3	56.2	51.8	46.8	44.6
LZSmax	82.6	84.9	82.2	89.3	77.1	67.1	72.4	76.6	76.6	69.0	67.7	63.1
LZSmin	46.5	55.4	53.6	59.0	55.2	49.9	45.5	43.6	40.9	37.7	39.6	42.8

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	63.6	61.5	59.8	58.7	60.7	63.4	67.2	66.6	65.3	65.7	67.5	67.2
LZSmax	80.9	76.9	73.6	75.5	79.8	83.7	80.9	76.8	78.9	83.8	87.4	88.8
LZSmin	37.3	40.3	43.7	45.3	48.2	51.5	55.9	60.4	54.9	53.2	57.5	47.0

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	61.7	61.0	54.9	52.9	57.0	53.2	57.3	54.1	52.1	54.5	53.3	52.7
LZSmax	76.0	71.0	69.8	65.8	64.6	65.6	67.0	71.0	67.1	65.9	72.9	73.0
LZSmin	52.1	48.8	46.7	42.4	46.2	44.6	43.2	38.5	38.6	39.0	39.4	38.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	52.5	50.9	50.7	49.0	46.4	44.5	43.0	41.7	41.1	40.0	39.6	40.0
LZSmax	75.9	69.6	63.7	63.8	64.4	64.7	63.3	62.7	62.7	60.8	57.9	52.5
LZSmin	37.2	35.4	34.6	33.1	32.6	32.8	33.6	34.7	35.9	36.7	37.7	39.4

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	27 Jul 2013 13:36:08	-25.6
PRM831	28 Apr 2013 15:34:24	-25.9
PRM831	23 Apr 2013 10:17:33	-25.0
PRM831	27 Feb 2013 19:15:30	-25.7
PRM831	24 Jan 2013 12:00:16	-25.6
PRM831	15 Jan 2013 07:50:44	-26.2
PRM831	04 Jan 2013 13:47:46	-26.5

File Translated: V:\Vista Env\2010\10022-Fresno Walmart\Noise Measurements\LD\15.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Revs: 4.283 / 3.120
Name:
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: slm&rta.ssa / SLM & Real-Time Analyzer
Location: 30' N of vendor truck loading area for Fresno Walmart
Note1: Approx 70' S of Locust Ave CL
Note2: 52F, 29.57 in Hg, 67% Humid., no wind, clear sky

Overall Any Data
Start Time: 19-May-2011 07:05:53
Elapsed Time: 00:08:30.5

	A Weight		C Weight		Flat	
Leq:	54.8 dBA		65.1 dBC		66.1 dBF	
SEL:	81.9 dBA		92.2 dBC		93.2 dBF	
Peak:	85.2 dBA		85.8 dBC		86.0 dBF	
	19-May-2011	07:09:58	19-May-2011	07:09:52	19-May-2011	07:09:52
Lmax (slow):	67.9 dBA		73.2 dBC		73.8 dBF	
	19-May-2011	07:09:50	19-May-2011	07:13:57	19-May-2011	07:13:57
Lmin (slow):	43.7 dBA		60.0 dBC		61.6 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:52	19-May-2011	07:06:51
Lmax (fast):	70.7 dBA		75.5 dBC		75.7 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (fast):	43.1 dBA		57.8 dBC		58.9 dBF	
	19-May-2011	07:11:17	19-May-2011	07:09:10	19-May-2011	07:09:10
Lmax (impulse):	72.1 dBA		76.8 dBC		77.1 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (impulse):	43.6 dBA		61.1 dBC		62.4 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:51	19-May-2011	07:09:10

Spectra

Date	Time	Run Time
19-May-2011	07:05:53	00:08:30.5

Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1	Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1
12.5	50.2		56.3		35.5		630	46.5		61.4		31.0	
16.0	50.9	55.5	56.1	61.5	37.1	41.8	800	45.4		60.8		30.5	
20.0	51.0		57.6		38.0		1000	44.5	49.3	56.1	63.9	31.7	35.6
25.0	55.8		57.5		41.1		1250	43.5		59.4		30.2	
31.5	57.7	61.6	57.1	63.3	46.2	49.9	1600	42.6		56.3		28.1	
40.0	56.7		60.3		46.3		2000	41.1	46.1	56.4	61.9	24.9	30.4
50.0	56.8		57.9		44.0		2500	40.0		58.4		21.7	
63.0	55.7	61.0	56.5	62.1	45.9	49.1	3150	40.2		60.8		19.4	
80.0	56.2		57.4		42.2		4000	39.5	43.8	58.6	63.4	18.7	24.1
100	55.6		55.1		42.3		5000	36.7		54.4		19.7	
125	54.3	59.2	59.0	63.8	40.7	45.7	6300	32.8		50.2		21.5	
160	52.8		61.0		39.4		8000	30.2	35.2	57.7	58.5	21.2	25.9
200	51.1		57.3		35.5		10000	25.4		41.5		20.5	
250	51.4	55.2	70.6	71.0	34.6	39.0	12500	22.9		32.2		19.4	
315	48.2		58.2		32.0		16000	20.8	26.5	27.4	33.9	19.1	24.4
400	47.0		59.0		30.1		20000	21.2		23.8		20.3	
500	47.0	51.6	64.3	66.9	30.4	35.3							

Ln Start Level: 15 dB

L1.00	0.0 dBA	L50.00	0.0 dBA	L95.00	0.0 dBA
L5.00	0.0 dBA	L90.00	0.0 dBA	L99.00	0.0 dBA

Detector: Slow
Weighting: A
SPL Exceedance Level 1: 85.0 dB Exceeded: 0 times
SPL Exceedance level 2: 120 dB Exceeded: 0 times
Peak-1 Exceedance Level: 105 dB Exceeded: 0 times
Peak-2 Exceedance Level: 100 dB Exceeded: 0 times
Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

File Translated: V:\Vista Env\2010\10022-Fresno Walmart\Noise Measurements\LD\15.slmdl
Model/Serial Number: 824 / A3176

Current Any Data
Start Time: 19-May-2011 07:05:53
Elapsed Time: 00:08:30.5

	A Weight		C Weight		Flat	
Leq:	54.8 dBA		65.1 dBC		66.1 dBF	
SEL:	81.9 dBA		92.2 dBC		93.2 dBF	
Peak:	85.2 dBA		85.8 dBC		86.0 dBF	
	19-May-2011	07:09:58	19-May-2011	07:09:52	19-May-2011	07:09:52
Lmax (slow):	67.9 dBA		73.2 dBC		73.8 dBF	
	19-May-2011	07:09:50	19-May-2011	07:13:57	19-May-2011	07:13:57
Lmin (slow):	43.7 dBA		60.0 dBC		61.6 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:52	19-May-2011	07:06:51
Lmax (fast):	70.7 dBA		75.5 dBC		75.7 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (fast):	43.1 dBA		57.8 dBC		58.9 dBF	
	19-May-2011	07:11:17	19-May-2011	07:09:10	19-May-2011	07:09:10
Lmax (impulse):	72.1 dBA		76.8 dBC		77.1 dBF	
	19-May-2011	07:09:58	19-May-2011	07:11:34	19-May-2011	07:11:34
Lmin (impulse):	43.6 dBA		61.1 dBC		62.4 dBF	
	19-May-2011	07:11:17	19-May-2011	07:06:51	19-May-2011	07:09:10

Calibrated: 18-May-2011 13:09:02 Offset: -48.2 dB
Checked: 19-May-2011 06:46:08 Level: 113.9 dB
Calibrator not set Level: 114.0 dB
Cal Records Count: 0

Interval Records: Disabled Number Interval Records: 0
History Records: Disabled Number History Records: 0
Run/Stop Records: Number Run/Stop Records: 2

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.001
User	GT
Job Description	Mobil at 104 N Coast Hwy Laguna Beach
Location	5 ft from Gas Station Air Compressor
Measurement Description	
Start Time	Friday, 2018 September 21 08:53:10
Stop Time	Friday, 2018 September 21 08:55:11
Duration	00:02:00.7
Run Time	00:02:00.7
Pause	00:00:00.0
Pre Calibration	Friday, 2018 September 21 08:51:58
Post Calibration	None
Calibration Deviation	---

Note

Noise from operational Air/Water Machine
67 F, 29.93 in Hg, 70% Hu, 2 mph wind, low clouds

Overall Data

LAeq		66.9	dB
LASmax	2018 Sep 21 08:53:27	73.6	dB
LApeak (max)	2018 Sep 21 08:53:23	92.0	dB
LASmin	2018 Sep 21 08:53:10	64.0	dB
LCeq		73.4	dB
LAeq		66.9	dB
LCeq - LAeq		6.5	dB
LAIeq		68.6	dB
LAeq		66.9	dB
LAIeq - LAeq		1.6	dB
Ldn		66.9	dB
LDay 07:00-22:00		66.9	dB
LNight 22:00-07:00		---	dB
Lden		66.9	dB
LDay 07:00-19:00		66.9	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		87.7	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	70.8	dBA
LAS10.00	68.3	dBA
LAS33.30	66.3	dBA
LAS50.00	66.0	dBA
LAS66.60	65.8	dBA
LAS90.00	65.4	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 118.3	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.6	dB
Noise Floor	16.9	dB
Overload	143.1	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	61.9	61.8	66.0	69.0	67.7	63.6	63.9	61.9	55.4	57.5	58.9	58.6
LZSmax	80.0	71.1	70.2	72.0	72.6	69.8	65.8	63.7	61.1	66.8	70.7	72.9
LZSmin	49.7	57.2	59.4	67.0	63.5	60.5	60.5	57.4	50.5	48.3	47.4	46.2

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	55.9	58.8	55.7	55.4	57.6	57.7	60.2	61.5	61.7	62.7	66.9	59.3
LZSmax	72.8	77.1	71.2	69.4	66.2	63.7	65.5	68.8	67.2	69.0	69.7	65.6
LZSmin	41.2	41.9	43.8	46.5	51.4	52.5	54.1	54.6	53.5	58.4	64.8	53.4

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	60.3	61.9	65.3	59.5	55.4	58.7	62.8	56.4	54.2	58.8	58.2	52.7
LZSmax	70.0	70.0	68.3	68.8	59.7	62.3	64.9	60.3	58.2	60.2	61.2	56.5
LZSmin	52.8	55.4	62.4	55.9	52.0	52.1	58.4	52.3	51.0	54.9	51.8	49.4

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	49.7	51.1	50.8	51.4	53.4	53.1	54.0	53.9	54.4	55.2	54.1	51.8
LZSmax	56.4	56.8	57.8	59.8	63.3	63.9	67.9	65.8	67.3	70.0	68.7	63.9
LZSmin	45.8	46.0	44.7	43.5	43.6	43.3	43.4	42.4	41.9	43.4	40.5	39.6

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	21 Sep 2018 08:51:56	-25.6
PRM831	05 Sep 2018 11:51:21	-25.9
PRM831	13 Jun 2018 13:02:21	-25.7
PRM831	30 Mar 2018 23:00:57	-25.2
PRM831	30 Mar 2018 12:23:25	-25.8
PRM831	07 Mar 2018 13:40:34	-25.8
PRM831	28 Feb 2018 12:16:10	-25.9
PRM831	30 Jan 2018 23:18:32	-26.2
PRM831	30 Jan 2018 13:42:45	-26.2
PRM831	30 Jan 2018 13:32:25	-26.0
PRM831	30 Jan 2018 10:54:43	-26.0

SLM & RTA Summary
Translated: 17-Aug-2010 14:31:20

File Translated: V:\Vista Env\2010\10021-Atascadero Walmart\Noise Measurements\1.slmdl
Model Number: 824
Serial Number: A3176
Firmware Rev: 4.283
Software Version: 3.120
Name:
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup: SLM&RTA.ssa
Setup Descr: SLM & Real-Time Analyzer
Location: Southern edge of gas station property
Note 1: 100' west of El Camino Real CL and 150' south of Del Rio Rd CL
Note 2: 78 F 28.97 HG 32% Humid. 2 MPH wind and clear sky

Overall Any Data
Start Time: 14-Aug-2010 12:03:04
Elapsed Time: 00:15:00.6

	A Weight		C Weight		Flat	
Leq:	61.7 dBA		74.5 dBC		75.3 dBF	
SEL:	91.2 dBA		104.0 dBC		104.8 dBF	
Peak:	105.2 dBA		108.2 dBC		110.1 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmax (slow):	73.4 dBA		88.4 dBC		90.8 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmin (slow):	49.4 dBA		63.1 dBC		64.6 dBF	
	14-Aug-2010 12:04:03		14-Aug-2010 12:04:03		14-Aug-2010 12:04:03	
Lmax (fast):	81.1 dBA		96.0 dBC		98.4 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmin (fast):	48.5 dBA		61.4 dBC		62.8 dBF	
	14-Aug-2010 12:04:02		14-Aug-2010 12:04:02		14-Aug-2010 12:04:02	
Lmax (impulse):	84.8 dBA		99.1 dBC		101.5 dBF	
	14-Aug-2010 12:09:24		14-Aug-2010 12:09:24		14-Aug-2010 12:09:24	
Lmin (impulse):	48.7 dBA		63.7 dBC		65.4 dBF	
	14-Aug-2010 12:04:02		14-Aug-2010 12:04:03		14-Aug-2010 12:04:03	

Spectra
Start Time: 14-Aug-2010 12:03:04 Run Time: 00:15:00.6

Freq	Leq 1/3	Leq 1/1	Max 1/3	Max 1/1	Min 1/3	Min 1/1
12.5 Hz	55.3		72.2		36.3	
16.0 Hz	57.4	63.9	79.4	90.6	38.4	43.4
20.0 Hz	62.0		90.2		40.3	
25.0 Hz	65.1		93.7		43.9	
31.5 Hz	64.2	69.1	89.6	95.4	44.9	49.1
40.0 Hz	63.7		83.4		44.1	
50.0 Hz	67.7		88.2		46.6	
63.0 Hz	65.9	71.2	84.2	90.1	45.9	51.5
80.0 Hz	65.3		79.8		47.5	
100 Hz	65.0		76.4		46.3	
125 Hz	66.0	70.0	76.5	80.7	45.4	50.7
160 Hz	64.4		74.6		46.1	
200 Hz	59.6		70.5		41.9	
250 Hz	58.7	63.0	66.2	76.1	43.2	46.8
315 Hz	55.6		74.0		40.8	
400 Hz	53.6		75.8		39.0	
500 Hz	52.9	57.7	75.4	79.0	38.5	43.8
630 Hz	52.1		67.7		39.4	
800 Hz	52.5		68.9		40.2	
1000 Hz	51.8	56.3	69.8	73.4	39.2	43.6
1250 Hz	49.9		66.4		36.4	
1600 Hz	48.1		63.6		34.8	

2000 Hz	46.5	51.5	64.3	68.5	30.1	36.6
2500 Hz	45.1		63.2		27.3	
3150 Hz	44.3		62.5		25.2	
4000 Hz	42.5	47.6	58.5	64.6	22.9	28.2
5000 Hz	40.9		56.1		21.5	
6300 Hz	38.5		52.4		20.1	
8000 Hz	36.0	41.0	51.0	55.9	18.9	23.9
10000 Hz	31.8		49.3		18.3	
12500 Hz	27.9		46.0		18.0	
16000 Hz	24.5	30.9	36.7	46.6	19.1	24.2
20000 Hz	25.3		31.5		20.7	

Ln Start Level: 15 dB

L (1.00)	0.0
L (5.00)	0.0
L (50.00)	0.0
L (90.00)	0.0
L (95.00)	0.0
L (99.00)	0.0

Detector: Slow
Weighting: A

SPL Exceedance Level 1:	85.0 dB	Exceeded:	0 times
SPL Exceedance Level 2:	120.0 dB	Exceeded:	0 times
Peak-1 Exceedance Level:	105.0 dB	Exceeded:	1 times
Peak-2 Exceedance Level:	100.0 dB	Exceeded:	1 times

Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

Current Any Data
Start Time: 14-Aug-2010 12:03:04
Elapsed Time: 00:15:00.6

	A Weight	C Weight	Flat
Leq:	61.7 dBA	74.5 dBC	75.3 dBF
SEL:	91.2 dBA	104.0 dBC	104.8 dBF
Peak:	105.2 dBA	108.2 dBC	110.1 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmax (slow):	73.4 dBA	88.4 dBC	90.8 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmin (slow):	49.4 dBA	63.1 dBC	64.6 dBF
	14-Aug-2010 12:04:03	14-Aug-2010 12:04:03	14-Aug-2010 12:04:03
Lmax (fast):	81.1 dBA	96.0 dBC	98.4 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmin (fast):	48.5 dBA	61.4 dBC	62.8 dBF
	14-Aug-2010 12:04:02	14-Aug-2010 12:04:02	14-Aug-2010 12:04:02
Lmax (impulse):	84.8 dBA	99.1 dBC	101.5 dBF
	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24	14-Aug-2010 12:09:24
Lmin (impulse):	48.7 dBA	63.7 dBC	65.4 dBF
	14-Aug-2010 12:04:02	14-Aug-2010 12:04:03	14-Aug-2010 12:04:03

Calibrated:	14-Aug-2010 12:02:00	Offset:	-47.3 dB
Checked:	14-Aug-2010 12:02:00	Level:	93.3 dB
Calibrator	not set	Level:	114.0 dB
Cal Records Count:	0		

Interval Records:	Disabled	Number Interval Records:	0
Time History:	Disabled	Number History Records:	0
Run/Stop Records:		Number Run/Stop Records:	2

File Translated: C:\Vista Env\2008\080201 - Santa Rosa Lowes\Noise Measurements\LD\7.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Revs: 4.272 / 3.120
Name: Vista Environmental
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: slm&rta.ssa / SLM & Real-Time Analyzer
Location: 10' north of McDonalds drive thru speaker
Note1:
Note2:

Overall Any Data
Start Time: 03-Jun-2008 17:55:14
Elapsed Time: 00:12:12.1

	A Weight		C Weight		Flat	
Leq:	61.2 dBA		76.1 dBC		77.6 dBF	
SEL:	89.8 dBA		104.7 dBC		106.2 dBF	
Peak:	94.9 dBA		100.5 dBC		102.0 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48
Lmax (slow):	73.6 dBA		88.5 dBC		88.7 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (slow):	55.0 dBA		69.3 dBC		70.9 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	17:58:39	03-Jun-2008	18:00:37
Lmax (fast):	76.1 dBA		91.4 dBC		91.6 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (fast):	54.3 dBA		67.7 dBC		69.0 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	18:00:37	03-Jun-2008	18:00:37
Lmax (impulse):	79.2 dBA		92.1 dBC		93.8 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:03:31	03-Jun-2008	18:02:48
Lmin (impulse):	54.9 dBA		70.2 dBC		71.5 dBF	
	03-Jun-2008	17:59:21	03-Jun-2008	17:58:39	03-Jun-2008	18:00:36

Spectra

Date	Time	Run Time
03-Jun-2008	17:55:14	00:12:12.1

Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1	Hz	Leq1/3	Leq1/1	Max1/3	Max1/1	Min1/3	Min1/1
12.5	65.1		68.7		49.5		630	51.6		56.8		45.8	
16.0	65.1	69.5	65.9	71.8	53.1	57.1	800	51.2		55.0		45.4	
20.0	64.0		66.0		53.3		1000	50.9	55.5	54.4	59.4	45.6	50.1
25.0	68.9		65.4		57.8		1250	50.1		54.6		44.9	
31.5	68.1	73.5	65.6	70.5	57.7	62.3	1600	49.1		52.3		42.5	
40.0	69.1		66.2		57.1		2000	47.3	52.3	51.2	55.9	39.5	45.0
50.0	66.1		71.7		58.2		2500	45.6		49.5		37.0	
63.0	68.4	72.6	70.8	81.6	57.8	62.7	3150	44.1		48.7		34.1	
80.0	68.6		80.7		57.7		4000	42.1	47.3	46.5	51.4	32.6	37.4
100	66.7		73.7		56.0		5000	40.8		43.1		30.2	
125	66.6	70.3	86.6	87.8	53.1	58.6	6300	37.4		39.4		26.7	
160	61.7		81.0		50.6		8000	35.5	40.3	37.7	42.4	23.7	29.1
200	56.8		68.2		47.8		10000	32.2		34.6		20.7	
250	56.1	60.4	66.2	71.2	46.0	51.4	12500	29.5		31.3		13.3	
315	53.4		63.8		45.8		16000	26.1	31.9	28.1	33.5	12.7	18.9
400	52.2		62.6		45.9		20000	23.7		23.5		15.8	
500	52.1	56.7	56.8	64.4	46.2	50.7							

Ln Start Level: 15 dB

L1.00	0.0 dBA	L50.00	0.0 dBA	L95.00	0.0 dBA
L5.00	0.0 dBA	L90.00	0.0 dBA	L99.00	0.0 dBA

Detector: Slow
Weighting: A
SPL Exceedance Level 1: 85.0 dB Exceeded: 0 times
SPL Exceedance level 2: 120 dB Exceeded: 0 times
Peak-1 Exceedance Level: 105 dB Exceeded: 0 times
Peak-2 Exceedance Level: 100 dB Exceeded: 0 times
Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

File Translated: C:\Vista Env\2008\080201 - Santa Rosa Lowes\Noise Measurements\LD\7.slmdl
Model/Serial Number: 824 / A3176

Current Any Data
Start Time: 03-Jun-2008 17:55:14
Elapsed Time: 00:12:12.1

	A Weight		C Weight		Flat	
Leq:	61.2 dBA		76.1 dBC		77.6 dBF	
SEL:	89.8 dBA		104.7 dBC		106.2 dBF	
Peak:	94.9 dBA		100.5 dBC		102.0 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48	03-Jun-2008	18:02:48
Lmax (slow):	73.6 dBA		88.5 dBC		88.7 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (slow):	55.0 dBA		69.3 dBC		70.9 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	17:58:39	03-Jun-2008	18:00:37
Lmax (fast):	76.1 dBA		91.4 dBC		91.6 dBF	
	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31	03-Jun-2008	18:03:31
Lmin (fast):	54.3 dBA		67.7 dBC		69.0 dBF	
	03-Jun-2008	17:59:22	03-Jun-2008	18:00:37	03-Jun-2008	18:00:37
Lmax (impulse):	79.2 dBA		92.1 dBC		93.8 dBF	
	03-Jun-2008	18:02:48	03-Jun-2008	18:03:31	03-Jun-2008	18:02:48
Lmin (impulse):	54.9 dBA		70.2 dBC		71.5 dBF	
	03-Jun-2008	17:59:21	03-Jun-2008	17:58:39	03-Jun-2008	18:00:36

Calibrated: 03-Jun-2008 15:40:24 Offset: -47.5 dB
Checked: 03-Jun-2008 15:40:24 Level: 94.0 dB
Calibrator not set Level: 94.0 dB
Cal Records Count: 0

Interval Records: Disabled Number Interval Records: 0
History Records: Disabled Number History Records: 0
Run/Stop Records: Number Run/Stop Records: 2

APPENDIX E

FHWA Model Traffic Noise Contour Calculations

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: **Central Avenue (SR-74)** **Segment:** **East of Dexter Avenue**
Average Daily Traffic: 41100 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.02	-0.23	-1.20	74.3	71.5	70.7	66.6	74.1	74.58	70 dBA:	**136**	**146**
Medium Trucks	79.85	-8.57	-0.23	-1.20	69.9	54.8	53.4	53.1	59.7	60.00	65 dBA:	**293**	**315**
Heavy Trucks	83.81	-12.27	-0.23	-1.20	70.1	51.0	46.8	50.9	57.2	57.35	60 dBA:	**631**	**680**
				Total:	**76.7**	**71.6**	**70.8**	**66.9**	**74.3**	**74.8**	55 dBA:	**1358**	**1464**

Road Name: **Riverside Drive (SR-74)** **Segment:** **West of Gunnerson Street - Strickland Avenue**
Average Daily Traffic: 21020 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.49	0.50	-1.20	68.1	65.3	64.5	60.4	67.9	68.4	70 dBA:	**46**	**50**
Medium Trucks	76.31	-10.10	0.50	-1.20	65.5	50.4	49.0	48.7	55.4	55.7	65 dBA:	**100**	**107**
Heavy Trucks	81.16	-13.80	0.50	-1.20	66.7	47.5	43.4	47.4	53.8	53.9	60 dBA:	**214**	**231**
				Total:	**71.7**	**65.6**	**64.6**	**60.9**	**68.3**	**68.8**	55 dBA:	**462**	**497**

Road Name: **Riverside Drive (SR-74)** **Segment:** **East of Lakeshore Drive**
Average Daily Traffic: 21050 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.50	0.50	-1.20	68.2	65.4	64.5	60.4	67.9	68.4	70 dBA:	**46**	**50**
Medium Trucks	76.31	-10.09	0.50	-1.20	65.5	50.5	49.1	48.7	55.4	55.7	65 dBA:	**100**	**107**
Heavy Trucks	81.16	-13.79	0.50	-1.20	66.7	47.6	43.4	47.4	53.8	53.9	60 dBA:	**215**	**231**
				Total:	**71.7**	**65.6**	**64.6**	**60.9**	**68.3**	**68.8**	55 dBA:	**462**	**498**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 24180 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.10	1.55	-1.20	69.8	67.0	66.1	62.1	69.6	70.1	70 dBA:	**55**	**59**
Medium Trucks	76.31	-9.49	1.55	-1.20	67.2	52.1	50.7	50.4	57.1	57.3	65 dBA:	**118**	**127**
Heavy Trucks	81.16	-13.19	1.55	-1.20	68.3	49.2	45.0	49.1	55.4	55.5	60 dBA:	**254**	**273**
				Total:	**73.3**	**67.2**	**66.3**	**62.5**	**70.0**	**70.4**	55 dBA:	**547**	**588**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 14760 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.04	0.50	-1.20	66.6	63.8	63.0	58.9	66.4	66.9	70 dBA:	**36**	**39**
Medium Trucks	76.31	-11.64	0.50	-1.20	64.0	48.9	47.5	47.2	53.9	54.1	65 dBA:	**79**	**85**
Heavy Trucks	81.16	-15.34	0.50	-1.20	65.1	46.0	41.8	45.9	52.2	52.4	60 dBA:	**169**	**182**
				Total:	**70.1**	**64.0**	**63.1**	**59.3**	**66.8**	**67.2**	55 dBA:	**365**	**393**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 13760 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.30	-6.55	-1.20	59.3	56.9	55.6	49.6	58.0	58.7	70 dBA:	**25**	**28**
Medium Trucks	76.31	-15.17	-6.55	-1.20	53.4	34.2	26.4	35.6	41.8	41.8	65 dBA:	**55**	**60**
Heavy Trucks	81.16	-12.95	-6.55	-1.20	60.5	43.5	35.7	44.9	51.1	51.1	60 dBA:	**118**	**128**
				Total:	**63.4**	**57.2**	**55.7**	**51.0**	**58.9**	**59.4**	55 dBA:	**255**	**276**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 41360 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.05	-0.23	-1.20	74.3	71.5	70.7	66.6	74.1	74.6	70 dBA:	**136**	**147**
Medium Trucks	79.85	-8.54	-0.23	-1.20	69.9	54.8	53.4	53.1	59.8	60.0	65 dBA:	**294**	**317**
Heavy Trucks	83.81	-12.24	-0.23	-1.20	70.1	51.0	46.9	50.9	57.3	57.4	60 dBA:	**633**	**682**
				Total:	**76.7**	**71.7**	**70.8**	**66.9**	**74.3**	**74.8**	55 dBA:	**1364**	**1470**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 21290 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.55	0.50	-1.20	68.2	65.4	64.5	60.5	68.0	68.5	70 dBA:	**47**	**50**
Medium Trucks	76.31	-10.04	0.50	-1.20	65.6	50.5	49.1	48.8	55.4	55.7	65 dBA:	**100**	**108**
Heavy Trucks	81.16	-13.75	0.50	-1.20	66.7	47.6	43.4	47.5	53.8	53.9	60 dBA:	**216**	**233**
				Total:	**71.7**	**65.6**	**64.7**	**60.9**	**68.4**	**68.8**	55 dBA:	**466**	**501**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 21310 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.55	0.50	-1.20	68.2	65.4	64.5	60.5	68.0	68.5	70 dBA:	**47**	**50**
Medium Trucks	76.31	-10.04	0.50	-1.20	65.6	50.5	49.1	48.8	55.4	55.7	65 dBA:	**100**	**108**
Heavy Trucks	81.16	-13.74	0.50	-1.20	66.7	47.6	43.4	47.5	53.8	53.9	60 dBA:	**216**	**233**
				Total:	**71.7**	**65.6**	**64.7**	**60.9**	**68.4**	**68.8**	55 dBA:	**466**	**502**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 24300 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.12	1.55	-1.20	69.8	67.0	66.2	62.1	69.6	70.1	70 dBA:	**55**	**59**
Medium Trucks	76.31	-9.47	1.55	-1.20	67.2	52.1	50.7	50.4	57.1	57.3	65 dBA:	**118**	**127**
Heavy Trucks	81.16	-13.17	1.55	-1.20	68.3	49.2	45.1	49.1	55.5	55.6	60 dBA:	**255**	**274**
				Total:	**73.4**	**67.2**	**66.3**	**62.6**	**70.0**	**70.5**	55 dBA:	**548**	**590**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 16920 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.55	0.50	-1.20	67.2	64.4	63.5	59.5	67.0	67.5	70 dBA:	**40**	**43**
Medium Trucks	76.31	-11.04	0.50	-1.20	64.6	49.5	48.1	47.8	54.4	54.7	65 dBA:	**86**	**93**
Heavy Trucks	81.16	-14.74	0.50	-1.20	65.7	46.6	42.4	46.5	52.8	52.9	60 dBA:	**186**	**200**
				Total:	**70.7**	**64.6**	**63.7**	**59.9**	**67.4**	**67.8**	55 dBA:	**400**	**430**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 13860 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.27	-6.55	-1.20	59.3	57.0	55.7	49.6	58.1	58.7	70 dBA:	**26**	**28**
Medium Trucks	76.31	-15.14	-6.55	-1.20	53.4	34.2	26.4	35.6	41.8	41.8	65 dBA:	**55**	**60**
Heavy Trucks	81.16	-12.92	-6.55	-1.20	60.5	43.5	35.7	44.9	51.1	51.1	60 dBA:	**119**	**129**
				Total:	**63.4**	**57.2**	**55.7**	**51.0**	**58.9**	**59.5**	55 dBA:	**256**	**278**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 43590 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.28	-0.23	-1.20	74.6	71.8	70.9	66.8	74.3	74.8	70 dBA:	**141**	**152**
Medium Trucks	79.85	-8.32	-0.23	-1.20	70.1	55.0	53.6	53.3	60.0	60.3	65 dBA:	**304**	**328**
Heavy Trucks	83.81	-12.02	-0.23	-1.20	70.4	51.3	47.1	51.2	57.5	57.6	60 dBA:	**656**	**707**
				Total:	**77.0**	**71.9**	**71.0**	**67.1**	**74.6**	**75.1**	55 dBA:	**1413**	**1523**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 21890 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.67	0.50	-1.20	68.3	65.5	64.7	60.6	68.1	68.6	70 dBA:	**47**	**51**
Medium Trucks	76.31	-9.92	0.50	-1.20	65.7	50.6	49.2	48.9	55.6	55.8	65 dBA:	**102**	**110**
Heavy Trucks	81.16	-13.62	0.50	-1.20	66.8	47.7	43.6	47.6	54.0	54.1	60 dBA:	**220**	**237**
				Total:	**71.9**	**65.7**	**64.8**	**61.1**	**68.5**	**69.0**	55 dBA:	**475**	**511**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 21930 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.67	0.50	-1.20	68.3	65.5	64.7	60.6	68.1	68.6	70 dBA:	**48**	**51**
Medium Trucks	76.31	-9.92	0.50	-1.20	65.7	50.6	49.2	48.9	55.6	55.8	65 dBA:	**102**	**110**
Heavy Trucks	81.16	-13.62	0.50	-1.20	66.8	47.7	43.6	47.6	54.0	54.1	60 dBA:	**221**	**237**
				Total:	**71.9**	**65.7**	**64.8**	**61.1**	**68.5**	**69.0**	55 dBA:	**475**	**511**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 25190 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.28	1.55	-1.20	70.0	67.2	66.3	62.2	69.7	70.2	70 dBA:	**56**	**60**
Medium Trucks	76.31	-9.31	1.55	-1.20	67.4	52.3	50.9	50.6	57.2	57.5	65 dBA:	**121**	**130**
Heavy Trucks	81.16	-13.01	1.55	-1.20	68.5	49.4	45.2	49.3	55.6	55.7	60 dBA:	**261**	**281**
				Total:	**73.5**	**67.4**	**66.5**	**62.7**	**70.1**	**70.6**	55 dBA:	**562**	**605**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 15480 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.16	0.50	-1.20	66.8	64.0	63.2	59.1	66.6	67.1	70 dBA:	**38**	**41**
Medium Trucks	76.31	-11.43	0.50	-1.20	64.2	49.1	47.7	47.4	54.1	54.3	65 dBA:	**81**	**87**
Heavy Trucks	81.16	-15.13	0.50	-1.20	65.3	46.2	42.1	46.1	52.5	52.6	60 dBA:	**175**	**188**
				Total:	**70.3**	**64.2**	**63.3**	**59.6**	**67.0**	**67.4**	55 dBA:	**377**	**405**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 14350 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.12	-6.55	-1.20	59.5	57.1	55.8	49.8	58.2	58.8	70 dBA:	**26**	**28**
Medium Trucks	76.31	-14.99	-6.55	-1.20	53.6	34.4	26.6	35.8	42.0	42.0	65 dBA:	**56**	**61**
Heavy Trucks	81.16	-12.77	-6.55	-1.20	60.6	43.7	35.9	45.1	51.2	51.3	60 dBA:	**122**	**132**
				Total:	**63.6**	**57.3**	**55.9**	**51.2**	**59.1**	**59.6**	55 dBA:	**262**	**284**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 43850 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	3.30	-0.23	-1.20	74.6	71.8	70.9	66.8	74.4	74.9	70 dBA:	**142**	**153**
Medium Trucks	79.85	-8.29	-0.23	-1.20	70.1	55.1	53.7	53.4	60.0	60.3	65 dBA:	**306**	**329**
Heavy Trucks	83.81	-11.99	-0.23	-1.20	70.4	51.3	47.1	51.2	57.5	57.6	60 dBA:	**658**	**710**
				Total:	**77.0**	**71.9**	**71.0**	**67.2**	**74.6**	**75.1**	55 dBA:	**1418**	**1529**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 22160 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.72	0.50	-1.20	68.4	65.6	64.7	60.6	68.1	68.6	70 dBA:	**48**	**52**
Medium Trucks	76.31	-9.87	0.50	-1.20	65.7	50.7	49.3	49.0	55.6	55.9	65 dBA:	**103**	**111**
Heavy Trucks	81.16	-13.57	0.50	-1.20	66.9	47.8	43.6	47.7	54.0	54.1	60 dBA:	**222**	**239**
				Total:	**71.9**	**65.8**	**64.9**	**61.1**	**68.5**	**69.0**	55 dBA:	**479**	**515**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 22190 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.73	0.50	-1.20	68.4	65.6	64.7	60.6	68.1	68.6	70 dBA:	**48**	**52**
Medium Trucks	76.31	-9.86	0.50	-1.20	65.7	50.7	49.3	49.0	55.6	55.9	65 dBA:	**103**	**111**
Heavy Trucks	81.16	-13.57	0.50	-1.20	66.9	47.8	43.6	47.7	54.0	54.1	60 dBA:	**222**	**239**
				Total:	**71.9**	**65.8**	**64.9**	**61.1**	**68.5**	**69.0**	55 dBA:	**479**	**515**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING PLUS AMBIENT WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 25310 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	2.30	1.55	-1.20	70.0	67.2	66.3	62.3	69.8	70.3	70 dBA:	**56**	**61**
Medium Trucks	76.31	-9.29	1.55	-1.20	67.4	52.3	50.9	50.6	57.3	57.5	65 dBA:	**121**	**131**
Heavy Trucks	81.16	-12.99	1.55	-1.20	68.5	49.4	45.2	49.3	55.6	55.7	60 dBA:	**262**	**282**
				Total:	**73.5**	**67.4**	**66.5**	**62.7**	**70.2**	**70.6**	55 dBA:	**564**	**606**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 17640 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.73	0.50	-1.20	67.4	64.6	63.7	59.6	67.1	67.6	70 dBA:	**41**	**44**
Medium Trucks	76.31	-10.86	0.50	-1.20	64.7	49.7	48.3	48.0	54.6	54.9	65 dBA:	**89**	**95**
Heavy Trucks	81.16	-14.56	0.50	-1.20	65.9	46.8	42.6	46.7	53.0	53.1	60 dBA:	**191**	**205**
				Total:	**70.9**	**64.8**	**63.9**	**60.1**	**67.5**	**68.0**	55 dBA:	**411**	**442**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 14450 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	-0.09	-6.55	-1.20	59.5	57.2	55.9	49.8	58.2	58.9	70 dBA:	**26**	**29**
Medium Trucks	76.31	-14.96	-6.55	-1.20	53.6	34.4	26.6	35.8	42.0	42.0	65 dBA:	**57**	**62**
Heavy Trucks	81.16	-12.74	-6.55	-1.20	60.7	43.7	35.9	45.1	51.3	51.3	60 dBA:	**122**	**133**
				Total:	**63.6**	**57.4**	**55.9**	**51.2**	**59.1**	**59.6**	55 dBA:	**263**	**285**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**
Average Daily Traffic: 62140 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	4.82	-0.23	-1.20	76.1	73.3	72.5	68.4	75.9	76.4	70 dBA:	**179**	**193**
Medium Trucks	79.85	-6.78	-0.23	-1.20	71.7	56.6	55.2	54.9	61.5	61.8	65 dBA:	**386**	**416**
Heavy Trucks	83.81	-10.48	-0.23	-1.20	71.9	52.8	48.6	52.7	59.0	59.1	60 dBA:	**831**	**895**
				Total:	**78.5**	**73.4**	**72.6**	**68.7**	**76.1**	**76.6**	55 dBA:	**1789**	**1929**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**
Average Daily Traffic: 31270 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.22	0.50	-1.20	69.9	67.1	66.2	62.1	69.6	70.1	70 dBA:	**60**	**65**
Medium Trucks	76.31	-8.38	0.50	-1.20	67.2	52.2	50.8	50.5	57.1	57.4	65 dBA:	**130**	**140**
Heavy Trucks	81.16	-12.08	0.50	-1.20	68.4	49.3	45.1	49.2	55.5	55.6	60 dBA:	**279**	**301**
				Total:	**73.4**	**67.3**	**66.4**	**62.6**	**70.0**	**70.5**	55 dBA:	**602**	**648**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**
Average Daily Traffic: 31350 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.23	0.50	-1.20	69.9	67.1	66.2	62.1	69.6	70.1	70 dBA:	**60**	**65**
Medium Trucks	76.31	-8.36	0.50	-1.20	67.2	52.2	50.8	50.5	57.1	57.4	65 dBA:	**130**	**140**
Heavy Trucks	81.16	-12.06	0.50	-1.20	68.4	49.3	45.1	49.2	55.5	55.6	60 dBA:	**280**	**301**
				Total:	**73.4**	**67.3**	**66.4**	**62.6**	**70.0**	**70.5**	55 dBA:	**603**	**649**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITHOUT PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 29840 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.01	1.55	-1.20	70.7	67.9	67.1	63.0	70.5	71.0	70 dBA:	**63**	**68**
Medium Trucks	76.31	-8.58	1.55	-1.20	68.1	53.0	51.6	51.3	58.0	58.2	65 dBA:	**136**	**146**
Heavy Trucks	81.16	-12.28	1.55	-1.20	69.2	50.1	46.0	50.0	56.4	56.5	60 dBA:	**292**	**314**
				Total:	**74.3**	**68.1**	**67.2**	**63.5**	**70.9**	**71.4**	55 dBA:	**629**	**677**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 17900 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.79	0.50	-1.20	67.5	64.7	63.8	59.7	67.2	67.7	70 dBA:	**42**	**45**
Medium Trucks	76.31	-10.80	0.50	-1.20	64.8	49.7	48.3	48.0	54.7	55.0	65 dBA:	**89**	**96**
Heavy Trucks	81.16	-14.50	0.50	-1.20	66.0	46.8	42.7	46.7	53.1	53.2	60 dBA:	**193**	**207**
				Total:	**71.0**	**64.9**	**63.9**	**60.2**	**67.6**	**68.1**	55 dBA:	**415**	**447**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 16810 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.57	-6.55	-1.20	60.2	57.8	56.5	50.5	58.9	59.5	70 dBA:	**29**	**32**
Medium Trucks	76.31	-14.30	-6.55	-1.20	54.3	35.1	27.3	36.5	42.6	42.7	65 dBA:	**63**	**68**
Heavy Trucks	81.16	-12.08	-6.55	-1.20	61.3	44.3	36.6	45.8	51.9	52.0	60 dBA:	**135**	**147**
				Total:	**64.3**	**58.0**	**56.6**	**51.9**	**59.8**	**60.3**	55 dBA:	**291**	**316**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

	Vehicle Mix 1 (Vehicle Mix 1 (Local))				Vehicle Mix 2 (Vehicle Mix 2 (Arterial))				Vehicle Mix 3 (SR-74)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	62.99%	12.91%	15.10%	91.00%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	3.74%	0.68%	1.89%	6.31%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	1.47%	0.14%	1.08%	2.69%

Road Name: Central Avenue (SR-74) **Segment: East of Dexter Avenue**

Average Daily Traffic: 62400 Vehicles Vehicle Speed: 55 MPH Vehicle Mix: 3 Roadway Classification: Augmented Urban Arterial

	NOISE PARAMETERS AT 70 FEET FROM CENTERLINE (Equiv. Lane Dist: 50.95 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	72.73	4.83	-0.23	-1.20	76.1	73.3	72.5	68.4	75.9	76.4	70 dBA:	**179**	**193**
Medium Trucks	79.85	-6.76	-0.23	-1.20	71.7	56.6	55.2	54.9	61.5	61.8	65 dBA:	**387**	**417**
Heavy Trucks	83.81	-10.46	-0.23	-1.20	71.9	52.8	48.7	52.7	59.1	59.2	60 dBA:	**833**	**898**
				Total:	**78.5**	**73.5**	**72.6**	**68.7**	**76.1**	**76.6**	55 dBA:	**1794**	**1934**

Road Name: Riverside Drive (SR-74) **Segment: West of Gunnerson Street - Strickland Avenue**

Average Daily Traffic: 31540 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.25	0.50	-1.20	69.9	67.1	66.2	62.2	69.7	70.2	70 dBA:	**61**	**65**
Medium Trucks	76.31	-8.34	0.50	-1.20	67.3	52.2	50.8	50.5	57.2	57.4	65 dBA:	**130**	**140**
Heavy Trucks	81.16	-12.04	0.50	-1.20	68.4	49.3	45.1	49.2	55.5	55.6	60 dBA:	**281**	**302**
				Total:	**73.4**	**67.3**	**66.4**	**62.6**	**70.1**	**70.5**	55 dBA:	**606**	**652**

Road Name: Riverside Drive (SR-74) **Segment: East of Lakeshore Drive**

Average Daily Traffic: 31610 Vehicles Vehicle Speed: 40 MPH Vehicle Mix: 3 Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.26	0.50	-1.20	69.9	67.1	66.3	62.2	69.7	70.2	70 dBA:	**61**	**65**
Medium Trucks	76.31	-8.33	0.50	-1.20	67.3	52.2	50.8	50.5	57.2	57.4	65 dBA:	**131**	**141**
Heavy Trucks	81.16	-12.03	0.50	-1.20	68.4	49.3	45.2	49.2	55.6	55.7	60 dBA:	**281**	**303**
				Total:	**73.4**	**67.3**	**66.4**	**62.7**	**70.1**	**70.5**	55 dBA:	**606**	**653**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: CUMULATIVE WITH PROJECT CONDITIONS

Project: Kassab Travel Center
Site Conditions: Soft

Road Name: Riverside Drive (SR-74) **Segment: West of Lakeshore Drive**

Average Daily Traffic: 29960 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 55 FEET FROM CENTERLINE (Equiv. Lane Dist: 38.78 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	3.03	1.55	-1.20	70.7	67.9	67.1	63.0	70.5	71.0	70 dBA:	**63**	**68**
Medium Trucks	76.31	-8.56	1.55	-1.20	68.1	53.0	51.6	51.3	58.0	58.2	65 dBA:	**136**	**146**
Heavy Trucks	81.16	-12.26	1.55	-1.20	69.2	50.1	46.0	50.0	56.4	56.5	60 dBA:	**293**	**315**
				Total:	**74.3**	**68.1**	**67.2**	**63.5**	**70.9**	**71.4**	55 dBA:	**631**	**679**

Road Name: Lakeshore Drive **Segment: North of Riverside Drive (SR-74)**

Average Daily Traffic: 20060 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 3 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 45.6 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	1.29	0.50	-1.20	67.9	65.1	64.3	60.2	67.7	68.2	70 dBA:	**45**	**48**
Medium Trucks	76.31	-10.30	0.50	-1.20	65.3	50.2	48.8	48.5	55.2	55.5	65 dBA:	**96**	**104**
Heavy Trucks	81.16	-14.00	0.50	-1.20	66.5	47.3	43.2	47.2	53.6	53.7	60 dBA:	**208**	**224**
				Total:	**71.5**	**65.4**	**64.4**	**60.7**	**68.1**	**68.6**	55 dBA:	**448**	**482**

Road Name: Lakeshore Drive **Segment: South of Riverside Drive (SR-74)**

Average Daily Traffic: 16910 Vehicles | Vehicle Speed: 40 MPH | Vehicle Mix: 2 | Roadway Classification: Urban Arterial

	NOISE PARAMETERS AT 140 FEET FROM CENTERLINE (Equiv. Lane Dist: 134.46 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	67.36	0.59	-6.55	-1.20	60.2	57.8	56.5	50.5	58.9	59.5	70 dBA:	**29**	**32**
Medium Trucks	76.31	-14.27	-6.55	-1.20	54.3	35.1	27.3	36.5	42.7	42.7	65 dBA:	**63**	**68**
Heavy Trucks	81.16	-12.05	-6.55	-1.20	61.4	44.4	36.6	45.8	51.9	52.0	60 dBA:	**136**	**147**
				Total:	**64.3**	**58.0**	**56.6**	**51.9**	**59.8**	**60.3**	55 dBA:	**292**	**317**

Appendix K

Traffic Impact Study

Traffic Impact Study

KASSAB TRAVEL CENTER
CITY OF LAKE ELSINORE, CA

Prepared for:
Sagecrest Planning+Environmental

April 17, 2018
revised August 31, 2018

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Executive Summary

This section provides an executive summary of the Traffic Impact Study through a set of frequently asked questions (FAQs).

Where is the project located and what would be developed?

The proposed project is located at 29301 Riverside Drive (northwest corner of Collier Avenue/Riverside Drive) in the City of Lake Elsinore in Riverside County (County). The proposed project is proposing an 18 fueling position gas station with convenience mart, and a 2,540 square foot fast-food restaurant with a drive-through.

What existing public streets will serve the project and where is access proposed?

A full access driveway on Collier Avenue and one right turn in/out restricted driveway on Riverside Drive (SR-74) would provide access to the project. The project will restripe the southbound approach at Collier Avenue/Riverside Drive (SR-74) to consist of one right lane and one shared-left lane in order to construct an additional northbound left-turn lane for the Collier Avenue driveway. Regional access would be provided by the I-15 freeway via interchanges at Nichols Road and Central Avenue (SR-74).

Is the site currently served by public transit?

The project site is served by RTA Route 8 and 22. A bus stop is located on the northeast corner of Collier Avenue/Riverside Drive. There is weekday and weekend service along Collier Avenue.

How many daily vehicular trips would the project generate and when would peak traffic volumes occur?

The proposed project is proposing an 18 fueling position gas station with convenience mart, and a 2,540 square foot fast-food restaurant with a drive-through. This project is expected to generate a net of 1,919 daily trips, 129 AM peak hour trips (65 inbound and 64 outbound), and 148 PM peak hour trips (75 inbound and 73 outbound).

What Transportation impacts are anticipated, if any?

The following intersections are forecast to be impacted under the Existing plus Project condition:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The following intersections are forecast to be impacted under the Existing plus Ambient Growth plus Project condition:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The following intersections are forecast to be impacted under the Existing plus Ambient Growth plus Project plus Cumulative Projects condition:

- I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
- Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)
- Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
- I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
- Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

What measures are proposed to reduce or control traffic impacts?

The following mitigation measures are recommended to improve the LOS at impacted intersections. These mitigation measures are applicable to the Existing plus Project scenario:

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during the PM peak hour.

The following mitigation measures are recommended to improve the LOS at impacted intersections. These mitigation measures are applicable to the Existing plus Ambient Growth plus Project scenario:

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS B during the PM peak hour.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the PM peak hour.

The following mitigation measures are recommended to improve the LOS at impacted intersections. These mitigation measures are applicable to the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario:

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the AM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during both the AM and PM.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS C during the PM peak hour.
- Collier Avenue (SR-74)/Riverside Drive (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Restripe two southbound approach lanes to one southbound through-left and one southbound through-right lane. With this mitigation, the intersection is forecast to operate at LOS D during both the AM and PM peak hour.
- I-15 SB Ramps/Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Install a third eastbound through lane and install a second (dual) southbound left turn lane. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Dexter Avenue /Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Change northbound left turn phasing to protected-permitted. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour.

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.
- The project's fair share percentages range from 0.9 percent through 12.5 percent for the intersection improvements discussed above.
- All roadway segments operate at LOS D or better and would operate within the City's standard of LOS D, except for Riverside Drive (SR-74), west of Collier Avenue. This segment is currently operating at LOS E-F under existing conditions, and is forecast to continue to operate at LOS E-F under Existing plus Ambient Growth plus Project conditions, as well as with the addition of traffic from cumulative projects (Existing plus Ambient Growth plus Project plus Cumulative Projects). Collier Avenue, south of Riverside Drive (SR-74) in the Existing plus Ambient Growth plus Project plus Cumulative Projects condition is forecast to degrade to LOS F with the addition of Cumulative Project traffic.

  Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

  The roadway segment of Riverside Drive, west of Collier Avenue is part of the TUMF network and is to be improved to its ultimate width using those funds. However, with the project improvements listed above, and the addition of project traffic (approximately 540 ADT), this segment of Riverside Drive (SR-74) is forecast to continue to operate at LOS E-F under both conditions. The project's fair share percentage for the roadway segment of Riverside Drive (SR-74), west of Collier Avenue would be 5.2 percent. Collier Avenue, south of Riverside Drive (SR-74), with the addition of project traffic (approximately 1,056 ADT), this segment of Collier Avenue (SR-74) is forecast to continue to operate LOS E-F under Existing plus Ambient Growth plus Project conditions. The project's fair share percentage for the roadway segment of Collier Avenue, south of Riverside Drive (SR-74) would be 9.6 percent.

Chapter 1. Introduction

The purpose of this traffic impact study (TIS) is to identify potential traffic-related impacts associated with the proposed Kassab Travel Center (proposed project), located at 29301 Riverside Drive (northwest corner of Collier Avenue/Riverside Drive) in the City of Lake Elsinore (City) in Riverside County (County). As necessary, and if required, mitigation measures will be identified to offset or reduce significant impacts.

This TIS has been prepared consistent with the requirements of the Riverside County Transportation Department *Traffic Impact Analysis Preparation Guide* (April 2008) and the City of Lake Elsinore General Plan. A *Scoping Agreement for Traffic Impact Study* has been submitted to, and approved, by the City Traffic Engineer, and is provided as an attachment to this TIS in Appendix A.

Figure 1 illustrates the project site location and the project study area.

Project Description

The project proposes to construct an 18 pump gas station with an 8,360 square foot (SF) convenience store containing two quick serve restaurants; and, a 2,543 SF fast food restaurant with drive through. Access to the project site would be via one driveway off Collier Avenue and one driveway off Riverside Drive. The project site plan is provided in Figure 2.

The current General Plan designation of the site is Limited Industrial and the site is zoned as Commercial Manufacturing. The proposed land use is Commercial with the proposed zoning as Commercial Manufacturing.

Pedestrian facilities, in the form of sidewalks, are proposed along the project's frontages on Collier Avenue and Riverside Drive. These sidewalks are shown to be 5 feet in width on Collier Avenue and 6 feet in width on Riverside Drive; and, will be constructed to be consistent with Caltrans and the City's Standard Plans. The proposed sidewalk on the west side of Collier Avenue would connect to the existing sidewalk north of the project site, which provides continuous pedestrian access to the adjacent retail and industrial uses, including the Outlets at Lake Elsinore, further to the north. The proposed sidewalk on the north side of Riverside Drive would be constructed just along the project frontage, as there are no other existing pedestrian facilities to connect with west of the project site.

Collier Avenue and Riverside Drive Improvements

Per the City's General Plan Roadway Classifications (Figure 2.3 of General Plan), Collier Avenue, north of Riverside Drive (along the project's frontage), is classified as a Major roadway with four lanes and a 100 foot right-of-way (80 feet, curb-to-curb). Riverside Drive (SR-74), west of Collier Avenue (along the project's frontage), is classified as an Urban Arterial with six lanes and a 120 foot right-of-way (96 feet, curb-to-curb). Figure 3, illustrates the street cross sections for a Major roadway and Urban Arterial.

The project will restripe the southbound approach at Collier Avenue/Riverside Drive (SR-74) to consist of one right lane and one shared-left lane in order to construct an additional northbound left-turn lane for the Collier Avenue driveway. Therefore, all project scenarios incorporate this alteration in geometrics. Figure 2 illustrates this change in access.

Currently, Collier Avenue, along the project's frontage, is not constructed to its ultimate Major roadway width of 80 feet, curb-to-curb. It is approximately 76 feet, curb-to-curb. Based on review of the project site plan, the proposed project will dedicate approximately 10 feet in order to allow their half-section of Collier Avenue to be consistent with the Major roadway

(half) cross section (center median, two travel lanes, six foot bike lane, and 5 foot sidewalk – in one direction). Street improvements on the west side of Collier Avenue, along the project's frontage, will conform with City roadway design standards.

- Widened roadway, with curb-and-gutter, on the west side of the centerline to include:
  - Widened sidewalk/landscape/parkway from six feet to 10 feet
  - New six foot wide bike lane (Class II – striped, on-pavement)

These improvements will be constructed to be consistent with the General Plan and the City's Standard Plans.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). With the street dedication on the north side (project frontage), the pavement width would be approximately 74 feet (48 feet from curb face to new centerline, plus 26 feet of existing pavement on the south side of the street). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

Study Area and Scope

Per the Scoping Agreement, this analysis focuses on the weekday AM (7:00 to 9:00 AM) peak period and the PM (4:00 to 6:00 PM) peak period. These periods represent the highest cumulative total traffic for the adjacent street system. The study intersections include:

1. I-15 NB ramps/Nichols Road
2. I-15 SB ramps/Nichols Road
3. Collier Avenue/Nichols Road
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)
5. Collier Avenue (SR-74)/Hunco Way
6. Collier Avenue (SR-74)/Central Avenue (SR-74)
7. I-15 SB ramps/Central Avenue (SR-74)
8. I-15 NB ramps/Central Avenue (SR-74)
9. Dexter Avenue/Central Avenue (SR-74)
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)
11. Lakeshore Drive/Riverside Drive (SR-74)

The study roadway segments include:

- Riverside Drive (SR-74), west of Collier Avenue
- Collier Avenue, north of Riverside Drive (SR-74)
- Collier Avenue, south of Riverside Drive (SR-74)

The study intersections were analyzed for the following scenarios:

- Existing Condition
- Existing plus Project
- Existing plus Ambient Growth plus Project
- Existing plus Ambient Growth plus Project plus Cumulative Projects

This TIS includes a description of existing conditions in the site vicinity, including roadway network, existing and future weekday AM and PM peak hour traffic volumes, and traffic operations.

Methodology

Signalized intersections. The operational characteristics of an intersection are determined by calculating the intersection's level of service (LOS). The intersection as a whole and its individual turning movements can be described alphabetically with a range of levels of service (A through F), with LOS A indicating free-flow traffic and LOS F indicating extreme congestion and long vehicle delays. At signalized intersections, LOS was calculated using the *Highway Capacity Manual 2010* (HCM) methodology. LOS at signalized intersections is measured based on the average vehicle delay of all of the movements. The *Synchro/ SimTraffic* (version 10) software was utilized to analyze intersection delay, LOS, and queues. The *Synchro/SimTraffic* software is consistent with HCM methodologies. Table 1 shows the relationship between v/c ratio and LOS for signalized intersections.

Table 1. Level of Service Criteria for Signalized Intersections using HCM Methodology

Level of Service	Average Control Delay	General Description (Signalized Intersections)
A	0.0 – 10.0 seconds	Free Flow
B	10.1 – 20.0 seconds	Stable Flow (slight delays)
C	20.1 – 35.0 seconds	Stable flow (acceptable delays)
D	35.1 to 55.0 seconds	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	55.1 to 80.0 seconds	Unstable flow (intolerable delay)
F	80.1 seconds or greater	Forced flow (jammed)

Unsignalized intersections. LOS at unsignalized intersections is classified by two intersection types: all-way stop-controlled and two-way stop-controlled. LOS for unsignalized intersections was also calculated using the *Synchro/SimTraffic* LOS software which is consistent with HCM methodology. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2 shows the relationship between vehicle delay and LOS for unsignalized intersections (both all-way and two-way, stop-controlled).

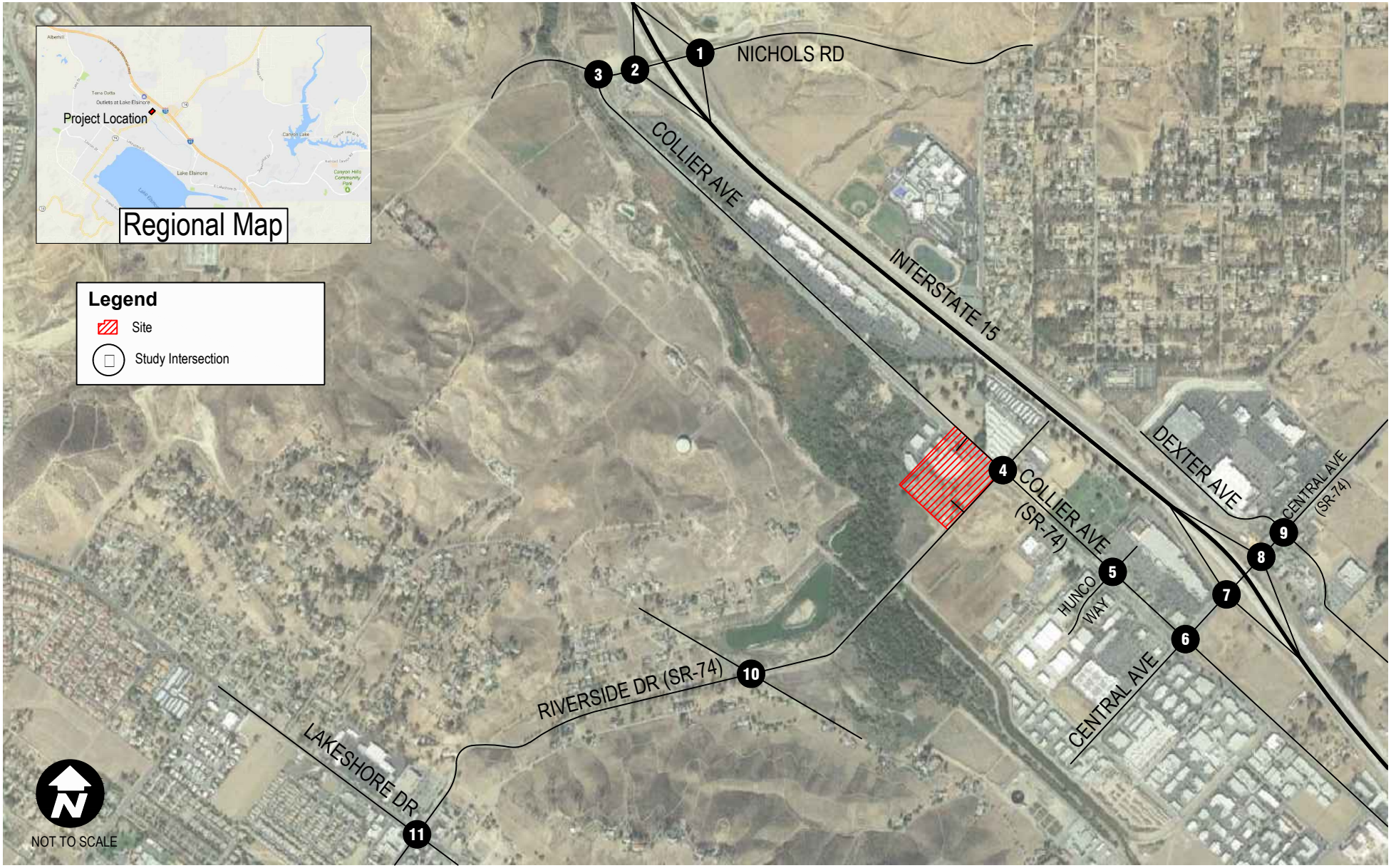
Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Two-Way and All-Way Stop Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

Source: *Highway Capacity Manual*, Transportation Research Board, 2010.

Future Traffic Forecasts. Existing plus Ambient Growth plus Project volumes were determined by adding a growth rate of two (2) percent per year to the existing traffic volumes as directed by the City staff. Existing plus Ambient Growth plus Project plus Cumulative Projects traffic volumes were determined by adding traffic from cumulative (approved and/or pending) projects to the Existing plus Ambient Growth plus Project scenario.

Significance Criteria. According to the City's General Plan Circulation Element, the worst acceptable level of service for study area intersections would be LOS D. Facilities operating at, or are forecast to operate at, LOS E or F would be considered deficient.



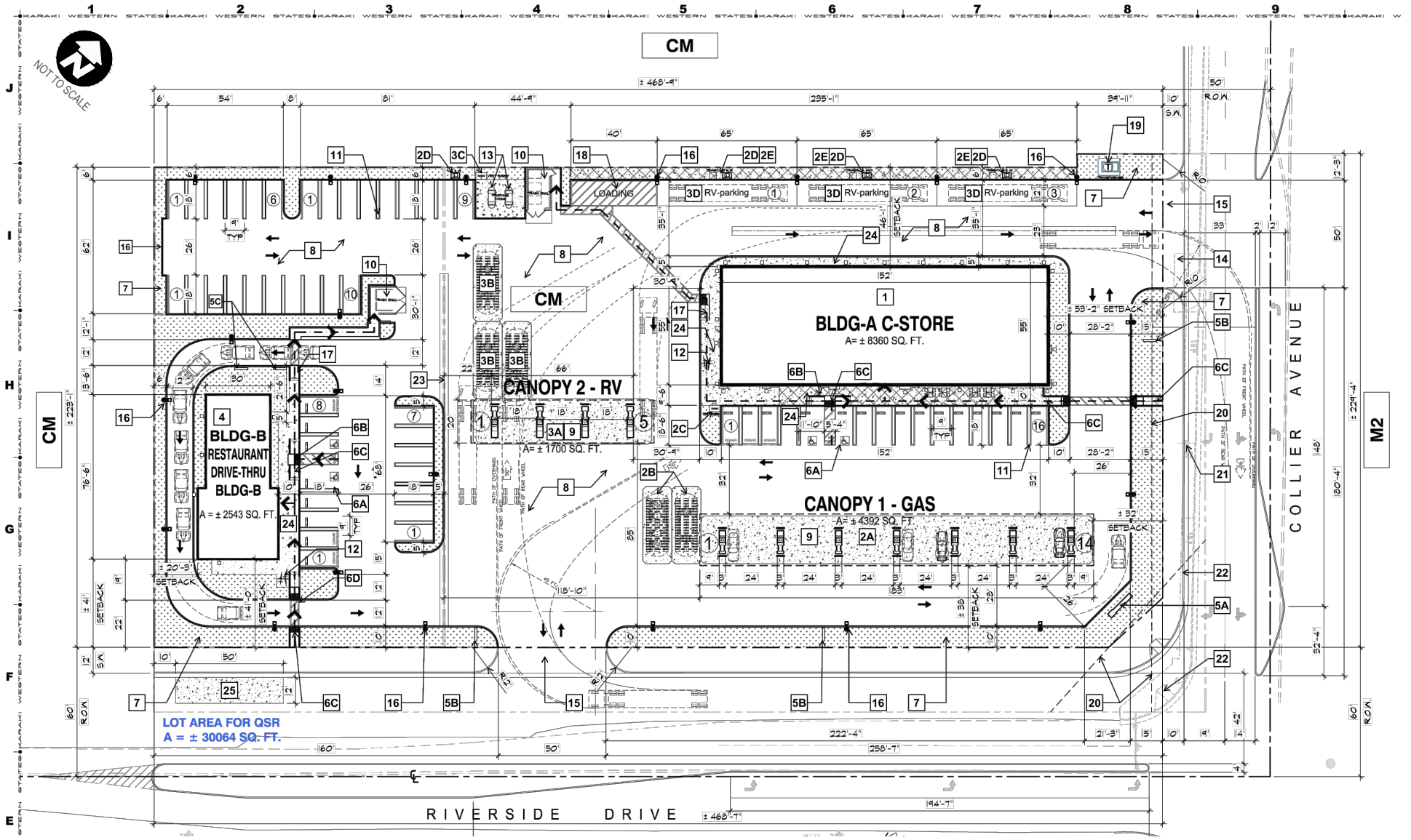
Source: Google Maps, 10/2016

Project Site Location and Stud□ □rea

FIGURE 1

Kassab Travel Center TIA

Jun 13, 2018 - 9:38am mpopovic P:\300.Environmental\Kassab Travel Center\Graphics\Base_KassabTravelCenter2.dwg Layout: Fig1-StudyArea

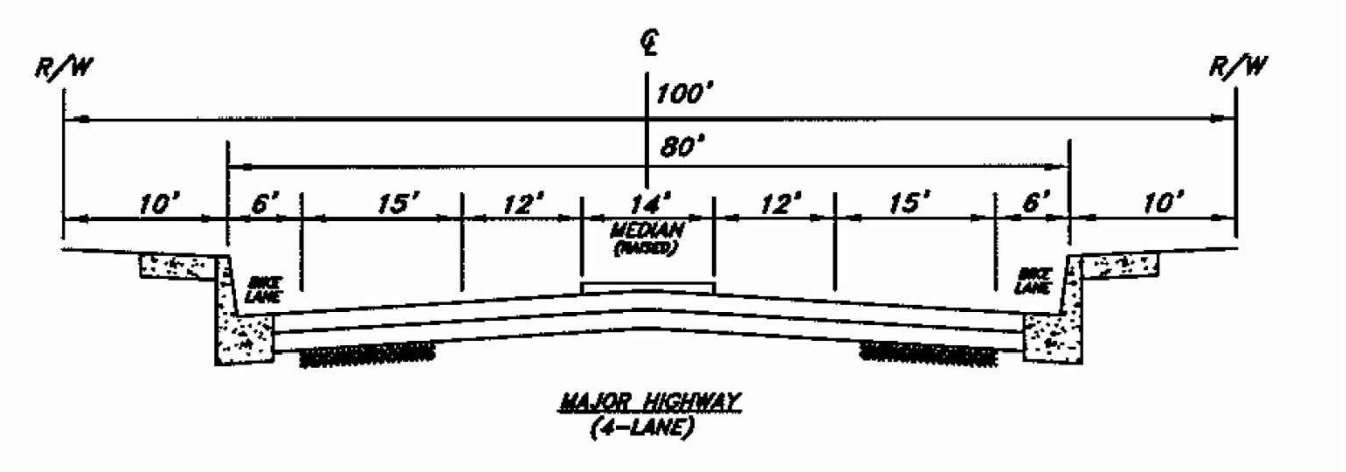


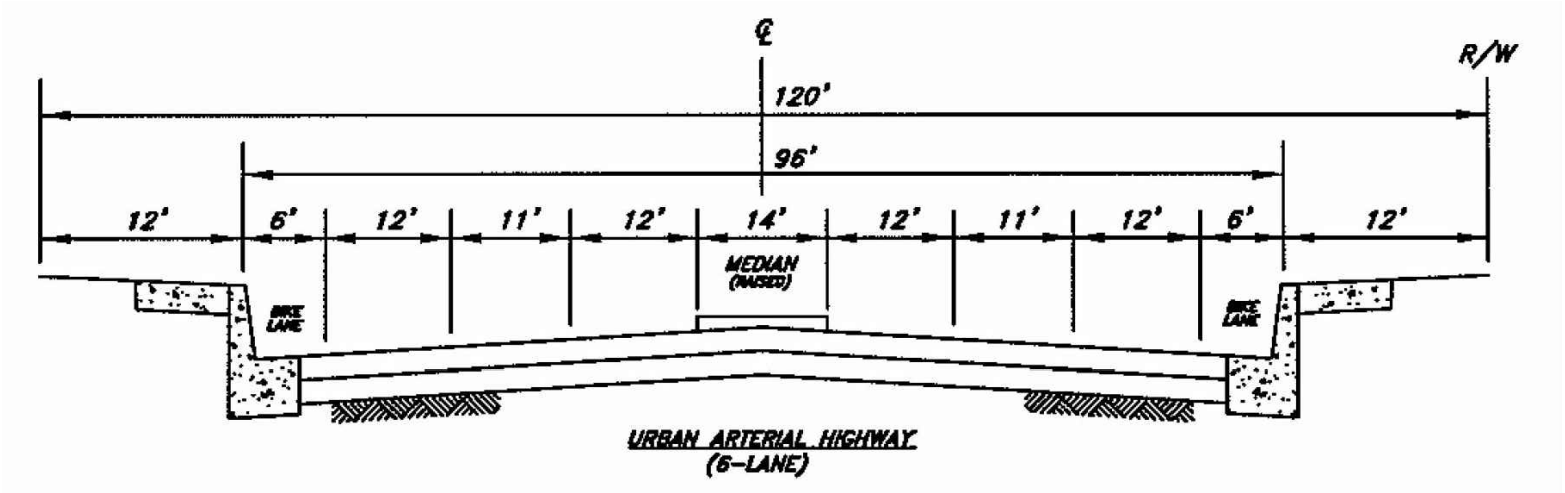
Source: Western States Engineering,05/31/18

Project Site Plan

FIGURE
2

Kassab Travel Center TIA





Source: City of Lake Elsinore Street Cross Sections Standard Plan No. 100C.

Street Cross Sections

FIGURE
3

Kassab Travel Center TIA

Chapter 2. Project Traffic Characteristics

Trip Generation

As noted previously in Chapter 1, the proposed project is an 18 fueling position gas station with an 8,360 square foot (SF) convenience store containing two quick serve restaurants; and, a 2,543 SF fast food restaurant with drive through. The trip generation for the project was calculated using trip rates from the Institute of Transportation Engineers' *Trip Generation, 9th Edition* (ITE 2012).

Pass-by trip reductions for retail uses allow for a reduction of project trips at all offsite intersections as it assumes that existing and/or baseline (background) traffic, already traveling on the street network, would deviate from their pattern and create a pass-by trip to a retail use. For example, a driver that is already traveling from his office, back to his home (which is called the "primary" trip), may now decide to pass-by a retail use (e.g., to purchase goods or food, or utilize services, like banks or gas stations) now that this use is on his way home. At that point, his existing trip through the street network is now a pass-by trip to the retail use, and not a creation of a new trip on the street network by the retail use. Pass-by trip reduction percentages were researched in ITE's *Trip Generation Manual* for the project's retail uses. The project trip generation calculations are shown in Table 3.

Table 3. Kassab Travel Center Trip Generation Estimates

				AM Peak Hour			PM Peak Hour		
Land Use		**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
Fast-Food Restaurant with Drive-Through Window [1]		TSF	496.12	23.16	22.26	45.42	16.98	15.67	32.65
Gasoline/Service Station with Convenience Market [2]		VFP	162.78	5.08	5.08	10.16	6.76	6.76	13.51
Project Trip Generation									
Fast-Food Restaurant with Drive-Through Window	2.54	TSF	1,260	59	57	115	43	40	83
Passby (49% AM/Daily, 50% PM) [3]			-630	-29	-28	-57	-22	-20	-41
NET			630	30	29	59	22	20	41
Gas Station & Convenience Market	18	VFP	2,930	91	91	183	122	122	243
Passby (62% AM/Daily, 56% PM) [3]			-1,641	-57	-57	-113	-68	-68	-136
NET			1,289	35	35	69	53	53	107
Total Trip Generation			4,190	150	148	298	165	161	326
NET Trip Generation			1,919	65	64	129	75	73	148

TSF = Thousand Square Feet, VFP = Vehicle Fueling Positions

[1] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 934 - Fast-Food Restaurant with Drive-Through Window.

[2] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 945 - Gasoline/Service Station with Convenience Market

[3] Pass-by percentages based on rates/equations obtained from the Trip Generation Handbook, 2nd Edition, ITE, 2004.

As shown in Table 3, the proposed project would generate a total of 4,190 daily trips, 298 AM peak hour trips, and 326 PM peak hour trips. With the application of pass-by trip reductions, the project would generate a net total of approximately 1,919 daily trips, 129 AM peak hour trips, and 148 PM peak hour trips.

Trip Distribution and Assignment

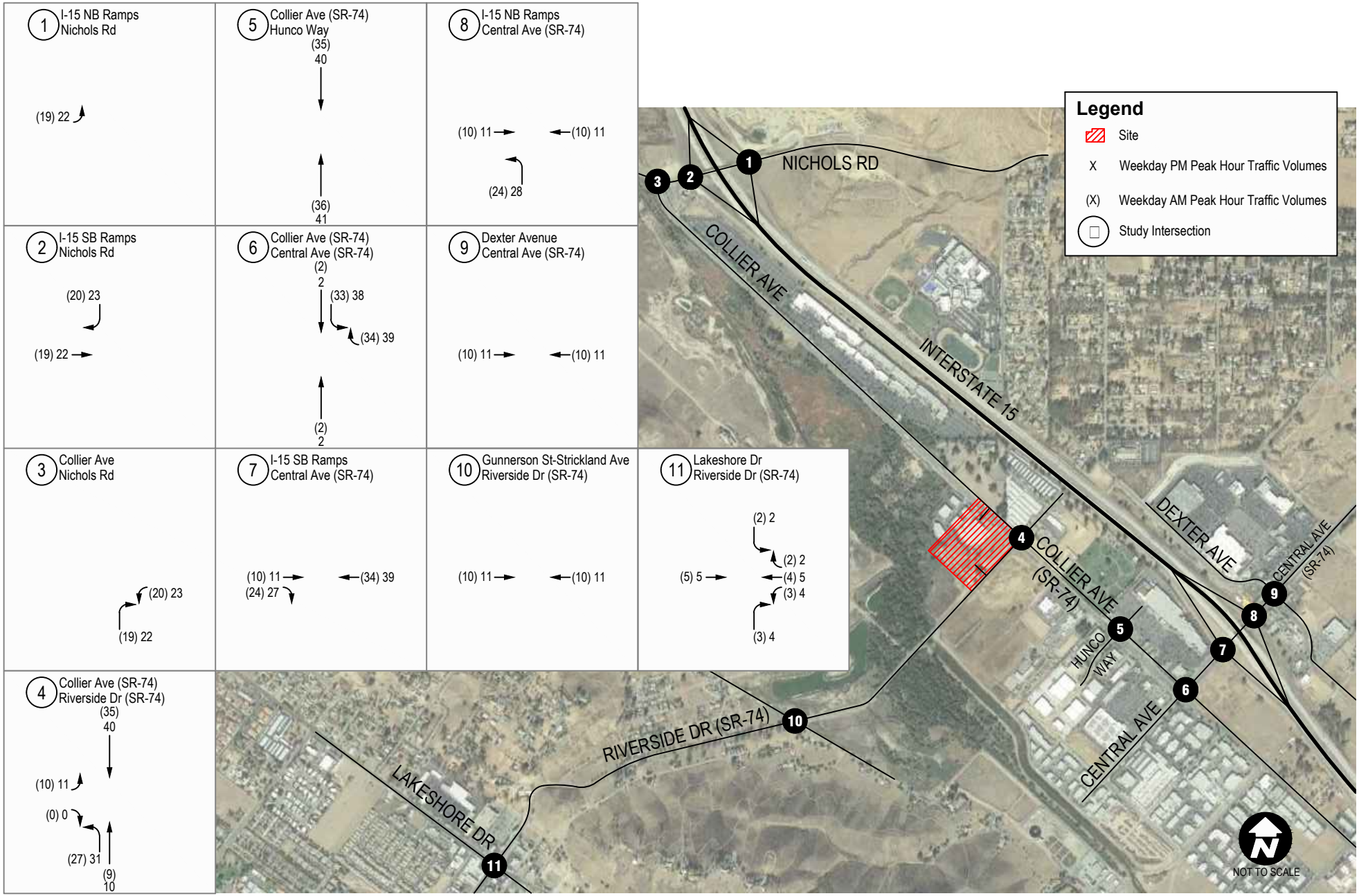
Based on the location of the project, it is likely that most project trips would utilize the freeway ramps at Nichols Road and Central Avenue to travel on Interstate 15. Other project traffic would be distributed through Central Avenue and Riverside Drive. The project's trip distribution is shown in Figure 4. The resulting project trip assignment is shown on Figure 5. In addition, the project driveway trip assignment, detailing the total trip generation at driveways, is shown in Figure 6. Pass-by trip information is provided in Figure 7, detailing inbound and outbound pass-by trips.

Source: Google Maps, 10/2016

Project Trip Distri□ution

FIGURE
4

Kassab Travel Center TIA

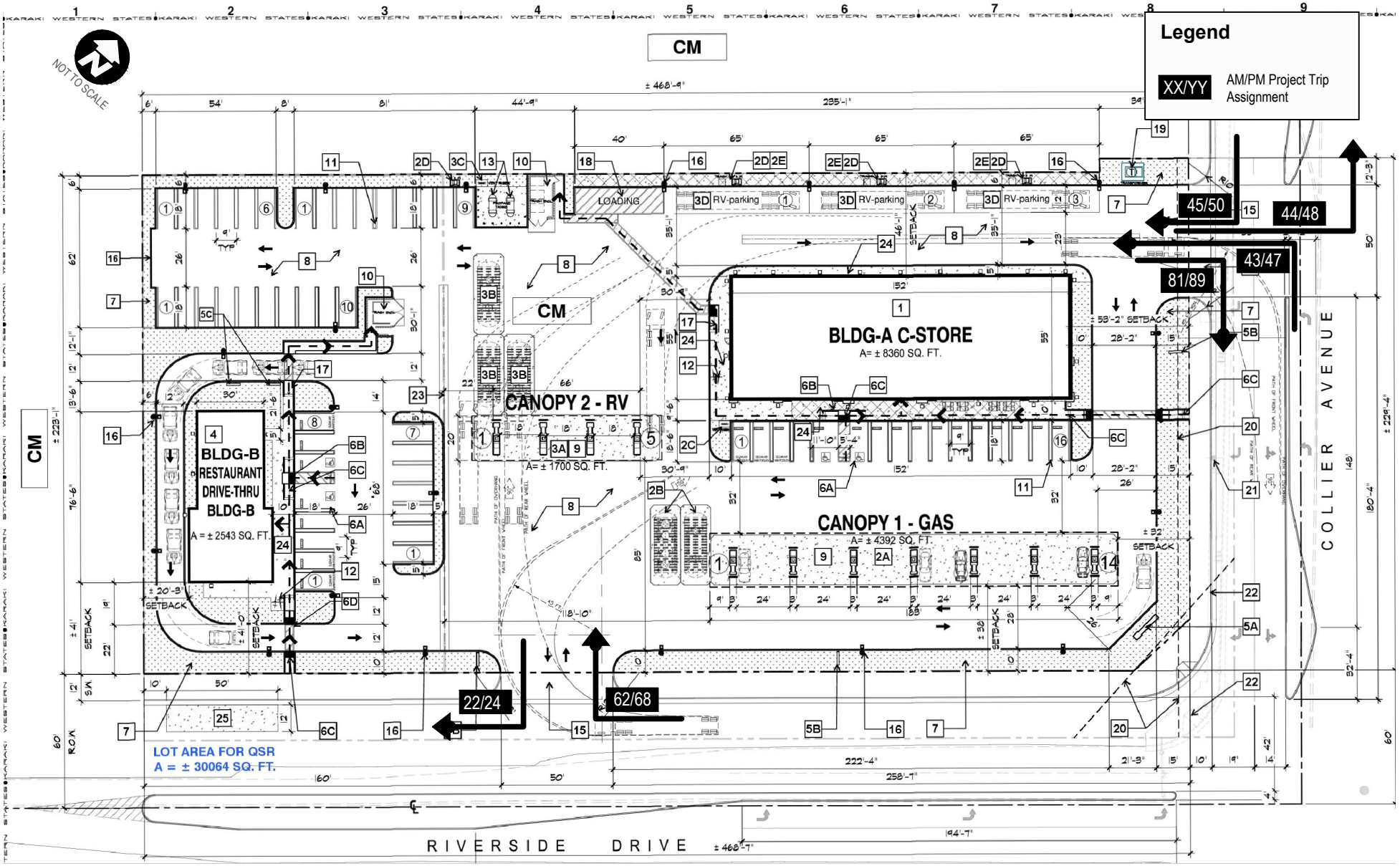


Source: Google Maps, 10/2016

Project □et Total Trip □ssignment

FIGURE
5

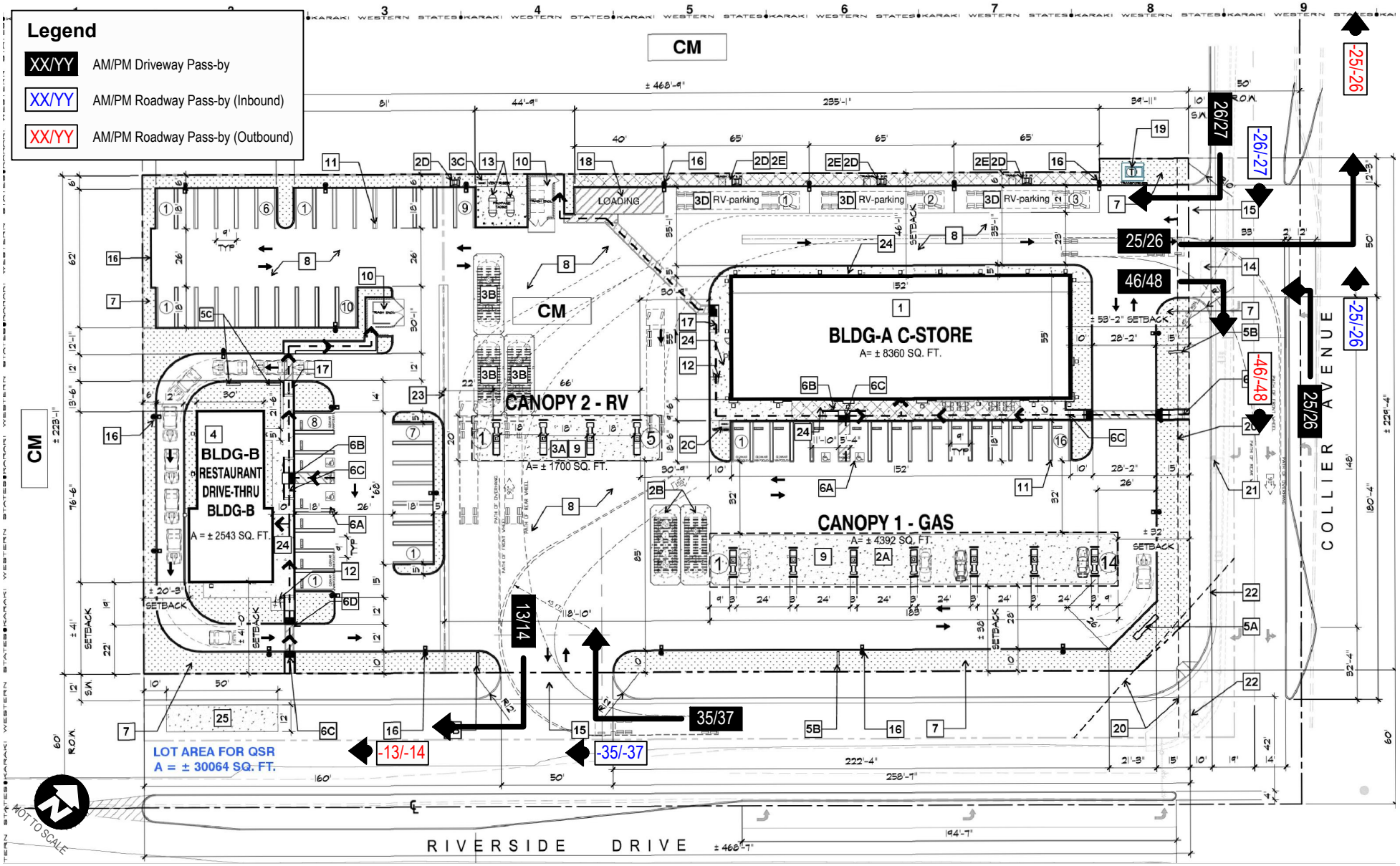
Kassab Travel Center TIA



Project Drive□a□Trip □ssignment

Kassab Travel Center TIA

FIGURE
6



Project Drive□a□Pass□□□ □ssignment

Kassab Travel Center TIA

FIGURE
7

Chapter 3. Existing Conditions

This section describes Existing conditions within the identified study area, as well as the Existing plus Project conditions and potential traffic impacts. Characteristics are provided for the roadway network, peak hour traffic volumes, traffic operations, traffic safety, non-motorized facilities, and transit.

Street System

Characteristics of the existing street system in the proposed project vicinity are shown in Table 4. Traffic control and geometrics at study area intersections is illustrated in Figure 8. As shown on Figure 2, access to the project is proposed to be provided from a driveway on Collier Avenue and two driveways on Riverside Drive (SR-74).

Table 4. Study Area Existing Street System Summary

Roadway	Street Classification1	Posted Speed Limit (mph)	Number of Travel Lanes	Parking	Sidewalks	Bicycle Lanes
Collier Avenue	Major	50	4	NO	YES	No
Nichols Road	Urban Arterial	40	2	N0	Some Segments	No
Riverside Drive (SR-74)	Urban Arterial	45	2	N0	E/O Collier Ave	No
Central Avenue (SR-74)	Augmented Urban Arterial	30 W/O Collier, 45 E/O Collier	4	NO	North Side Only, some segments on the South Side	No
Lakeshore Drive	Urban Arterial/Secondary	45	2 S/O Riverside Dr, 5 N/O Riverside Dr	NO	N/O Riverside Drive, some segments S/O Riverside Drive	No
Dexter Avenue	Collector	45	2 S/O Central, 3 N/O Central	NO	N/O Central Ave, some segments S/O Central Ave	No

Street classification is from the City of Lake Elsinore General Plan, N/O = north of, S/O = south of, E/O = east of, W/O = west of

Riverside Transit Agency (RTA) Routes 8 and 22 provide weekday and weekend service along Collier Avenue (SR-74). There is a bus stop on the east side of Collier Avenue (SR-74) north of Riverside Drive. This stop is directly across the project site.

Traffic Volumes

Existing turning movement counts at the study intersections were conducted in 2014, 2016, and 2017 while adjacent schools were in session. Traffic volumes collected in 2014 or 2016 were adjusted using an annual growth rate of two percent to bring them to existing 2017 conditions. Figure 9 illustrates the existing AM and PM peak hour traffic volumes.

Intersection Operations

An intersection LOS analysis was prepared for the Existing Baseline condition and is shown in Table 5. The adopted LOS threshold for the study locations is LOS D. Detailed LOS worksheets are included in Appendix C

Table 5. Existing Peak Hour Levels of Service

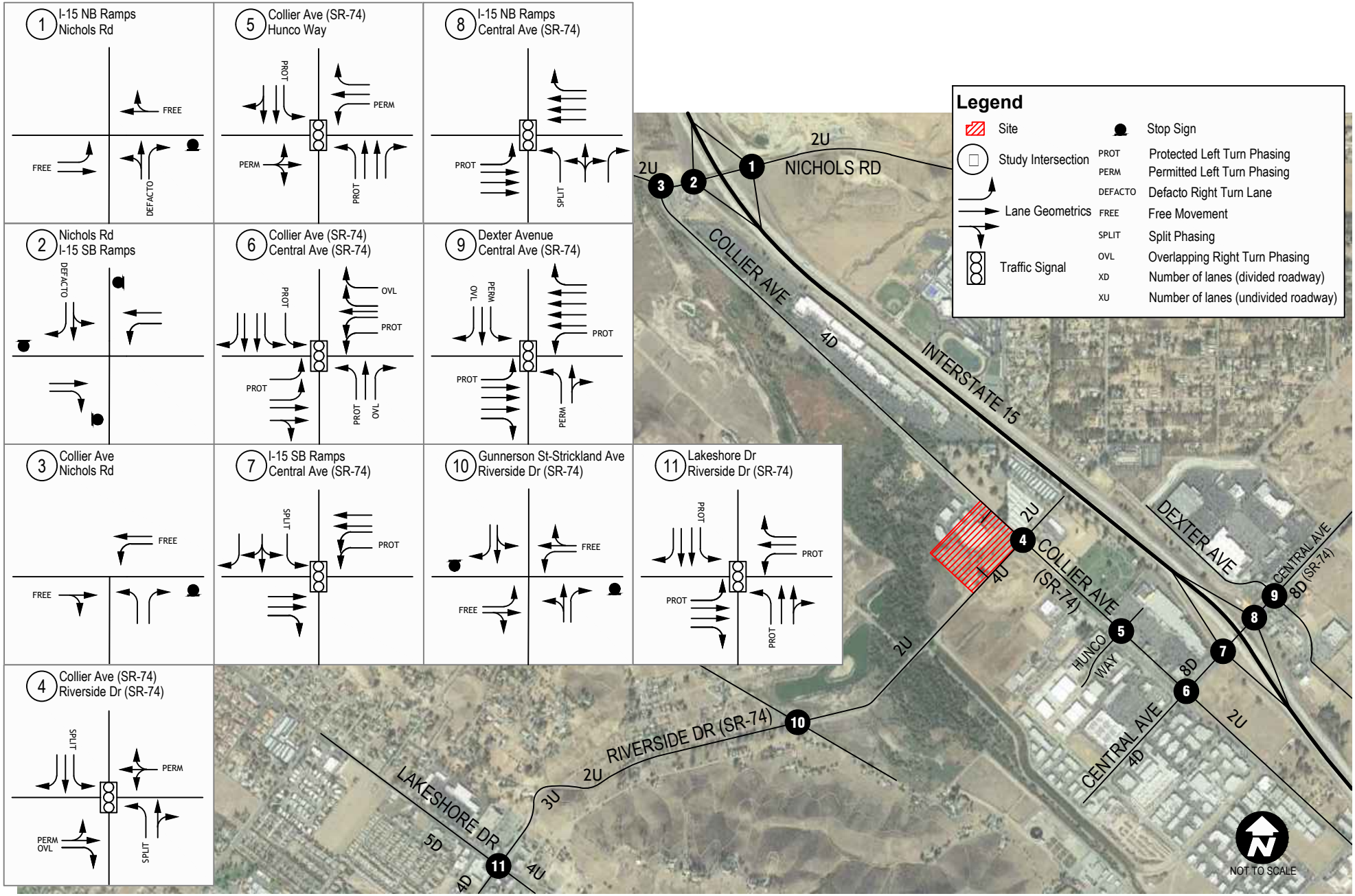
Intersection	Control	AM Peak		PM Peak	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. I-15 NB Ramps/Nichols Road	unsignalized	**103.5**	**F**	25.2	D
2. I-15 SB Ramps/Nichols Road	unsignalized	13.7	B	12.6	B
3. Collier Avenue/Nichols Road	unsignalized	20.3	C	31.5	D
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	signal	16.0	B	25.7	C
5. Collier Avenue (SR-74)/Hunco Way	signal	9.0	A	14.6	B
6. Collier Ave (SR-74)/Central Avenue (SR-74)	signal	34.0	C	37.8	D
7. I-15 SB Ramps/Central Avenue (SR-74)	signal	23.0	C	25.5	C
8. I-15 NB Ramps/Central Avenue (SR-74)	signal	13.8	B	13.5	B
9. Dexter Avenue/Central Avenue (SR-74)	signal	22.9	C	19.6	B
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	unsignalized	**62.3**	**F**	**209.1**	**F**
11. Lakeshore Drive/Riverside Drive (SR-74)	signal	26.3	C	34.8	C

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.

As shown in Table 5 all of the study intersections are currently operating at satisfactory LOS D or better during the weekday AM and PM peak hours under Existing conditions except for the following intersections:

- I-15 NB Ramps/Nichols Road (LOS F during the AM peak hour)
- Gunnerson Street-Strickland avenue/Riverside Drive (SR-74) (LOS F during both peak hours)



Source: Google Maps, 10/2016

Existing Traffic Controls and Geometrics

FIGURE 8

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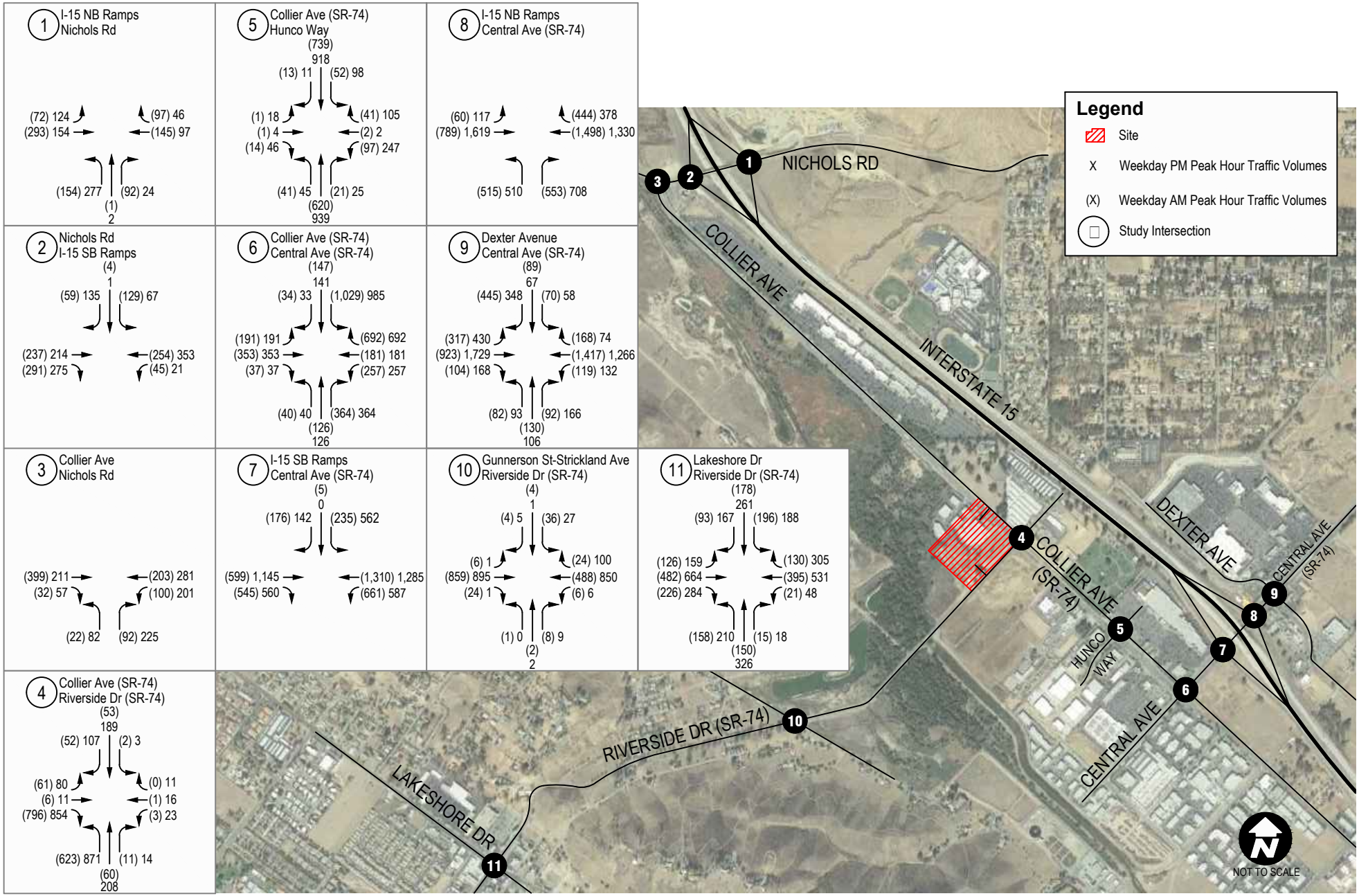

Source: Google Maps, 10/2016

E□isting Pea□ □our Tra□ic Volumes

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FIGURE
9

Chapter 4. Existing plus Project Traffic Analysis

This section documents project-generated impacts on the surrounding transportation system and at the study intersections during the Existing plus Project condition.

Traffic Volumes

Existing plus Project traffic volumes were determined by adding the project traffic volumes to the Existing traffic volumes. Figure 10 shows the Existing plus Project weekday AM and PM peak hour traffic volumes.

Intersection Operations

An intersection operations analysis was conducted to evaluate the Existing plus Project weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously. Project-related improvements to the existing traffic controls or geometrics were assumed for Collier Avenue/Riverside. These improvements are as follows:

- Restripe existing northbound through-right to through-left-right movement
- Reconfigure southbound approach to reflect cut into existing median to create larger storage length for Collier Avenue driveway inbound access.
    - Restripe existing southbound through lane to shared through-left movement

The remainder of the traffic controls and geometrics illustrated in Figure 8 were assumed. The project is expected to widen the north side of Riverside Drive along the project frontage. Table 6 provides a comparison between the Existing plus Project and Existing conditions for the weekday AM and PM peak hours. Detailed LOS worksheets are included in Appendix C.

As shown in Table 6, most of the study area intersections are forecast to operate at LOS D or better with the project, except for the following intersections:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

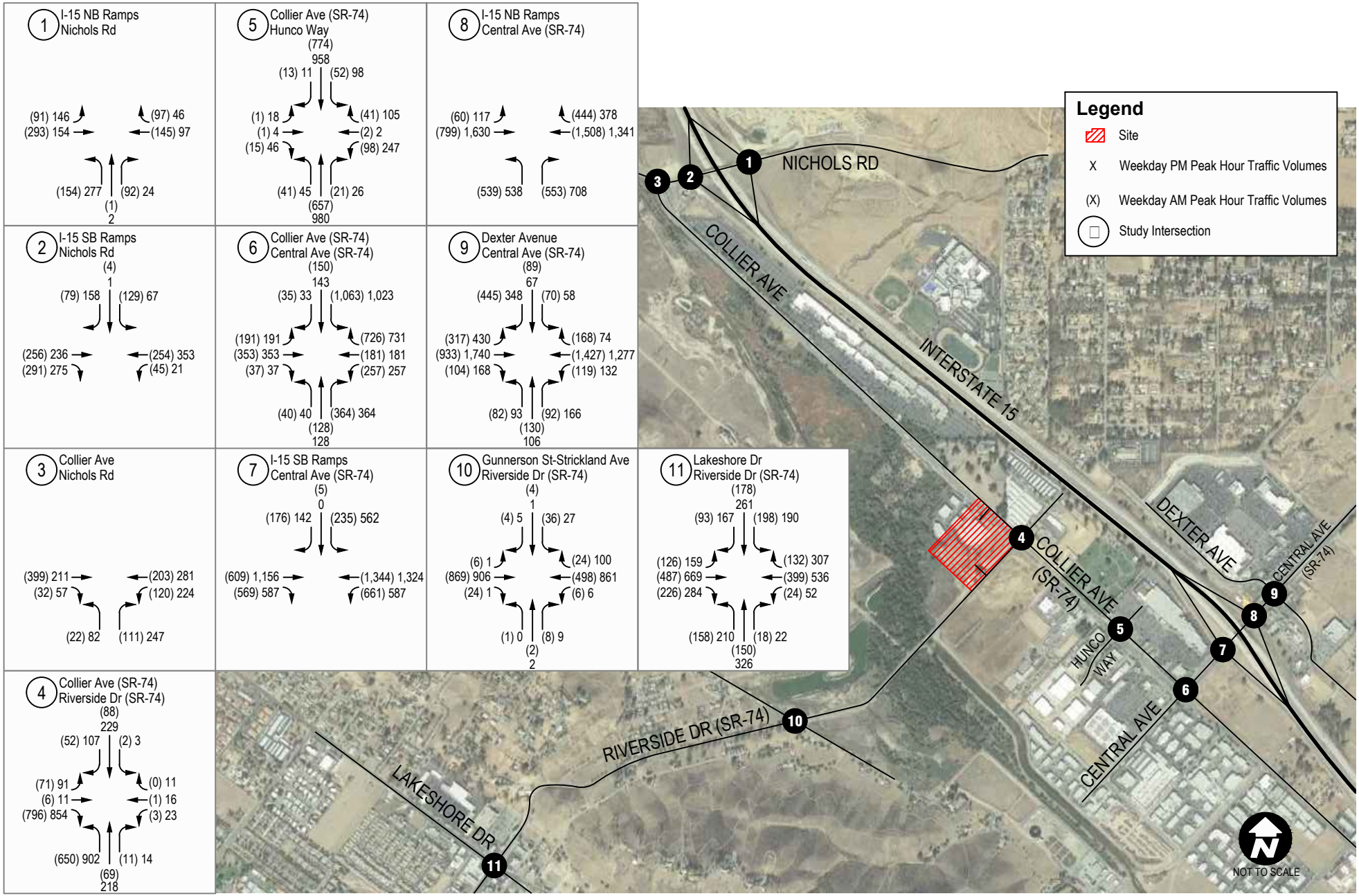
These intersections would be considered significantly impacted as the project would contribute its traffic to an intersection that is forecast to operate less that the City standard of LOS D or would cause an intersection that is operating at LOS D or better, to LOS E or F. Mitigation measures for these intersections are discussed in the mitigation section.

Table 6. Existing plus Project Intersection Levels of Service

	Existing				Existing plus Project				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**103.5**	**F**	25.2	D	**148.5**	**F**	29.8	D	**45.0**	4.6	**YES**	NO
2. I-15 SB Ramps/Nichols Road	13.7	B	12.6	B	14.2	B	13.0	B	0.5	0.4	NO	NO
3. Collier Avenue/Nichols Road	20.3	C	31.5	D	21.8	C	**35.9**	**E**	1.5	**4.4**	NO	**YES**
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	16.0	B	25.7	C	12.2	B	21.1	C	-3.8	-4.6	NO	NO
5. Collier Avenue (SR-74)/Hunco Way	9.0	A	14.6	B	9.1	A	14.8	B	0.1	0.2	NO	NO
6. Collier Ave (SR-74)/Central Avenue (SR-74)	34.0	C	37.8	D	34.3	C	41.2	D	0.3	3.4	NO	NO
7. I-15 SB Ramps/Central Avenue (SR-74)	23.0	C	25.5	C	24.7	C	26.8	C	1.7	1.3	NO	NO
8. I-15 NB Ramps/Central Avenue (SR-74)	13.8	B	13.5	B	13.8	B	13.6	B	0.0	0.1	NO	NO
9. Dexter Avenue/Central Avenue (SR-74)	22.9	C	19.6	B	22.9	C	19.6	B	0.0	0.0	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**62.3**	**F**	**209.1**	**F**	**65.9**	**F**	**217.8**	**F**	**3.6**	**8.7**	**YES**	**YES**
11. Lakeshore Drive/Riverside Drive (SR-74)	26.3	C	34.8	C	26.6	C	35.1	D	0.3	0.3	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.



Source: Google Maps, 10/2016

E□isting plus Project Pea□ □our Tra□i□c Volumes

FIGURE
10

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Chapter 5. Existing plus Ambient Growth plus Project Traffic Analysis

This section documents project-generated impacts on the surrounding transportation system and at the study intersections during the Existing plus Ambient Growth plus Project condition.

Central Plaza Project

The Central Plaza project is currently under construction on the southeast corner of Collier Avenue (SR-74)/Central Avenue (SR-74). The project will widen the roadways along its frontage as well as provide the following alterations in geometry to the intersection:

- Northbound approach will consist of one left turn lane, two through lanes, and two right turn lanes with overlap phasing

These alterations have been included within the analysis for Existing plus Ambient Growth plus Project scenario in addition to the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario. Due to these improvements over existing geometrics, some analyzed peak hours will contain a decrease in delay as compared to baseline condition.

Traffic Volumes

Existing plus Ambient Growth plus Project traffic volumes were determined by adding a growth rate of two (2) percent per year to the existing traffic volumes as directed by the City Traffic Engineer. Then, the project traffic volumes were added to the Existing plus Ambient Growth traffic volumes. Figure 11 shows the Existing plus Ambient Growth plus Project weekday AM and PM peak hour traffic volumes.

Intersection Operations

An intersection operations analysis was conducted to evaluate the Existing plus Ambient Growth plus Project weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously. Project-related improvements to the existing traffic controls or geometrics were assumed for Collier Avenue/Riverside as well as the improvements listed about for the Central Plaza Project. These improvements are as follows:

- Restripe existing northbound through-right to through-left-right movement
- Reconfigure southbound approach to reflect cut into existing median to create larger storage length for Collier Avenue driveway inbound access.
    - Restripe existing southbound through lane to shared through-left movement

The remainder of the traffic controls and geometrics illustrated in Figure 8 were assumed. The project is expected to widen the north side of Riverside Drive along the project frontage in the future, but the specific geometrics are unknown at this time. Table 7 provides a comparison between the Existing plus Ambient Growth plus Project and Existing conditions for the weekday AM and PM peak hours. Detailed LOS worksheets are included in Appendix C.

As shown in Table 6, most of the study area intersections are forecast to operate at LOS D or better with the project, except for the following intersections:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

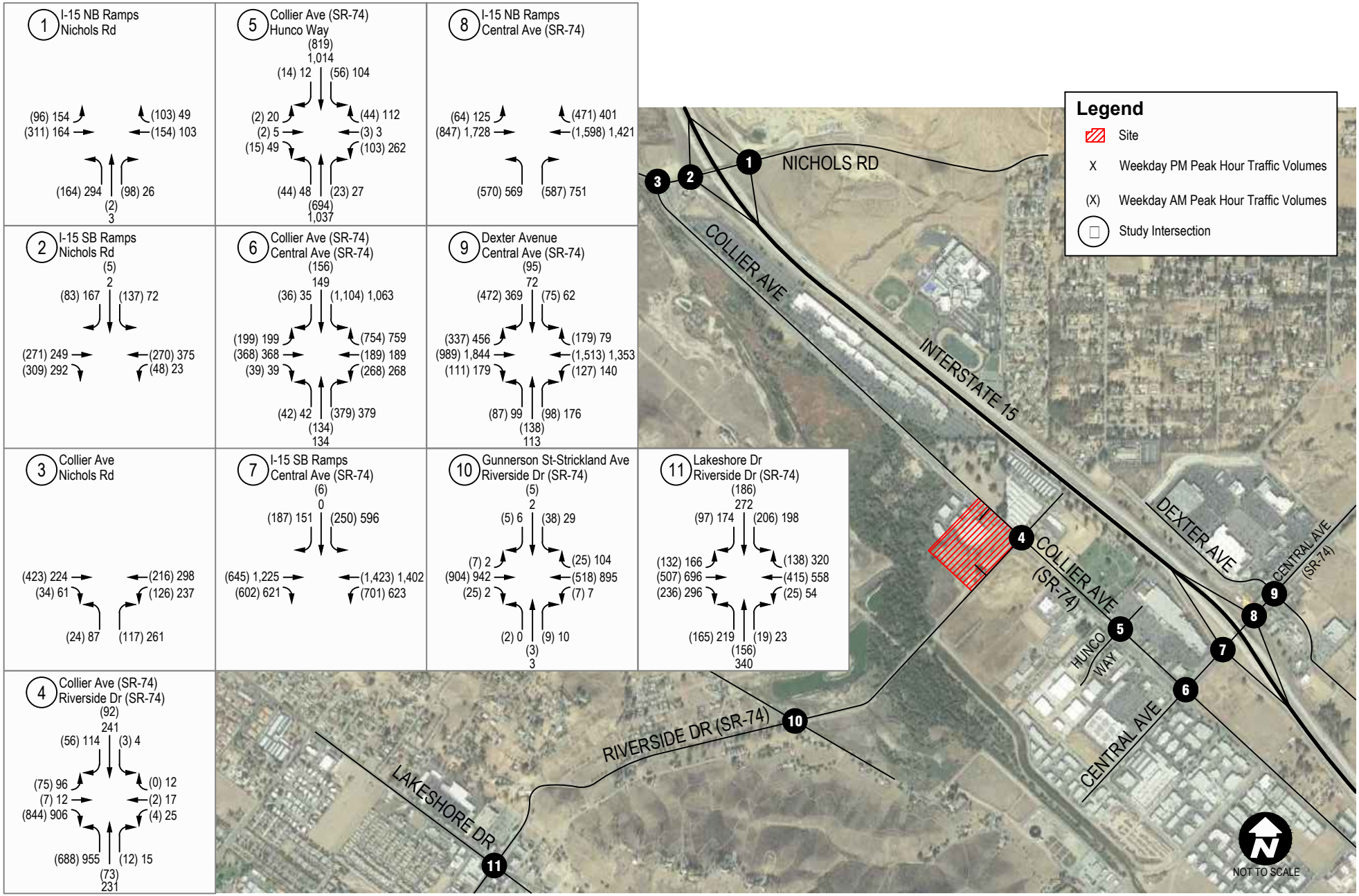
These intersections would be considered significantly impacted as the project would contribute its traffic to an intersection that is forecast to operate less that the City standard of LOS D or would cause an intersection that is operating at LOS D or better, to LOS E or F. Mitigation measures for these intersections are discussed in the mitigation section.

Table 7. Existing plus Ambient Growth plus Project Intersection Levels of Service

	Existing				Existing plus Ambient Growth plus Project				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**103.5**	**F**	25.2	D	**228.7**	**F**	**37.7**	**E**	**125.2**	12.5	**YES**	**YES**
2. I-15 SB Ramps/Nichols Road	13.7	B	12.6	B	15.4	C	14.1	B	1.7	1.5	NO	NO
3. Collier Avenue/Nichols Road	20.3	C	31.5	D	23.8	C	**44.0**	**E**	3.5	**12.5**	NO	**YES**
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	16.0	B	25.7	C	13.0	B	23.3	C	-3.0	-2.4	NO	NO
5. Collier Avenue (SR-74)/Hunco Way	9.0	A	14.6	B	9.4	A	16.0	B	0.4	1.4	NO	NO
6. Collier Ave (SR-74)/Central Avenue (SR-74)	34.0	C	37.8	D	32.9	C	40.3	D	-1.1	2.5	NO	NO
7. I-15 SB Ramps/Central Avenue (SR-74)	23.0	C	25.5	C	28.0	C	31.0	C	5.0	5.5	NO	NO
8. I-15 NB Ramps/Central Avenue (SR-74)	13.8	B	13.5	B	14.1	B	13.9	B	0.3	0.4	NO	NO
9. Dexter Avenue/Central Avenue (SR-74)	22.9	C	19.6	B	23.6	C	20.1	C	0.7	0.5	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**62.3**	**F**	**209.1**	**F**	**83.0**	**F**	**314.2**	**F**	**20.7**	**105.1**	**YES**	**YES**
11. Lakeshore Drive/Riverside Drive (SR-74)	26.3	C	34.8	C	27.9	C	37.8	D	1.6	3.0	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.



Source: Google Maps, 10/2016

E□isting plus □m□ient Gro□t□ plus Project Pea□ □our Tra□ic Volumes

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FIGURE
11

Chapter 6. Existing plus Ambient Growth plus Project plus Cumulative Projects Traffic Analysis

This section documents project-generated impacts in the cumulative condition on the surrounding transportation system and at the study intersections during the Existing plus Ambient Growth plus Project plus Cumulative Projects condition.

Traffic Volumes

Existing plus Ambient Growth plus Project plus Cumulative Projects traffic volumes were determined by adding a growth rate of two (2) percent per year to the existing traffic volumes as directed by the City Traffic Engineer. In addition, any traffic from cumulative (approved/ pending) projects were added to the study area intersections. City staff provided a list of cumulative projects. A majority of the projects were collated from the nearby Central Plaza project as well as other traffic impact studies. Appendix D provides information concerning the distribution and assignment of these projects, as well as the exact locations of each.

These projects are illustrated within Appendix D, while Figure 12 shows the cumulative projects' traffic volumes.

Trip generation estimates for these projects are based on application of trip rates from the Institute of Transportation Engineers' *Trip Generation, 9th Edition* (ITE 2012), and are presented in Table 8. As shown in Table 8, the cumulative projects in the study area would generate approximately 472,917 daily trips, 30,065 AM peak hour trips and 45,496 PM peak hour trips. The resulting Existing plus Ambient Growth plus Project plus Cumulative Projects Peak Hour Traffic Volumes are illustrated in Figure 13.

Intersection Operations

An intersection operations analysis was conducted in the study area to evaluate the Existing plus Ambient Growth plus Project plus Cumulative Projects weekday AM and PM peak hour conditions with the project. Intersection operations were calculated using the LOS methodology described previously.

The approved Central Plaza project will be improving its frontages along Collier Avenue and Central Avenue (SR-74) with the following roadway improvements:

- Collier Avenue/Central Avenue (SR-74)
  - addition of second northbound through lane
  - addition of second northbound right turn lane

- I-15 southbound ramps/Central Avenue (SR-74)
  - addition of third eastbound through lane

Table 8. Cumulative Projects Trip Generation Estimates

				AM Peak Hour			PM Peak Hour		
Land Use		**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates [1]									
Fitness Center		TSF	32.93	0.71	0.71	1.41	2.01	1.52	3.53
Single Family Residential		DU	9.52	0.19	0.56	0.75	0.63	0.37	1.00
Mini-Warehousing		ACRES	35.43	1.16	1.42	2.58	1.79	1.79	3.57
Senior Adult Housing - Attached		DU	3.44	0.07	0.13	0.20	0.14	0.12	0.25
Automobile Sales		TSF	32.30	1.44	0.48	1.92	1.05	1.57	2.62
Manufacturing		TSF	3.82	0.57	0.16	0.73	0.26	0.47	0.73
Residential Condominium/Townhouse		DU	5.81	0.07	0.37	0.44	0.35	0.17	0.52
Shopping Center		TSF	42.70	0.60	0.36	0.96	1.78	1.93	3.71
Project Trip Generation									
CUP03503 - Fitness Facility	45.46	TSF	1,497	32	32	64	91	69	160
PM33840 - Subdivide 4 res lots	4	DU	38	1	2	3	3	1	4
PM34997 - Subdivide 2 res lots	2	DU	19	0	1	1	1	1	2
PP20247 - Self-Storage (Mini-Warehouse & RV Parking Facility)	14.72	ACRES	522	17	21	38	26	26	53
(APN: 378-030-006) Boat Sale and Manufacturing Facility[2]	34.50	TSF	136	21	6	27	10	17	27
Spyglass Ranch (Single Family, Multi-family, and Commerical)[3]	694	DU	12,165	197	409	606	647	503	1,150
South Shore I (Single Family Res.)[3]	521	DU	4,960	98	293	391	328	193	521
South Shore II (Single Family Res.)[3]	400	DU	3,808	75	225	300	252	148	400
La Strada (Single Family Res.)[3]	134	DU	1,276	25	75	100	84	50	134
TAG Property (Car Dealership)[3]	50	TSF	1,615	72	24	96	52	79	131
City Center Condos[3]	144	DU	837	11	53	64	50	25	75
Diamond Specific Plan (Condos, Hotel, Office, Commerical)[3]			29,554	956	504	1,460	1,204	1,584	2,788
The Colony (Multi-family)[3]	211	DU	1,403	22	86	108	85	46	131
TAG Property (Single Family and Multi-family)[3]	2731	DU	24,797	475	1,472	1,947	1,629	947	2,576
John Lang Homes Phase 2 (Single Family, Multi-family, and Commerical)[3]	1955	DU	18,490	281	871	1,152	1,049	676	1,725
Summerly (Single Family Res.)[3]	142	DU	1,352	27	80	107	89	53	142
Beazer (Single Family Res.)[3]	72	DU	685	14	41	55	45	27	72
KB Homes (Single Family Res.)[3]	106	DU	1,009	20	60	80	67	39	106
McMillin Homes (Single Family Res.)[3]	143	DU	1,361	27	80	107	90	53	143
Richmond American (Single Family Res.)[3]	74	DU	704	14	42	56	47	27	74

LE Sports Complex[3]	525	TSF	17,756	710	366	1,076	705	734	1,439
Greenwald (Commercial)[3]	104.45	TSF	4,460	62	38	100	186	202	388
Ramsgate (Single Family and Multi-family)[3]	1426	DU	13,130	254	779	1,033	865	504	1,369
Canyon Hills Estates (Single Family Res.)[3]	302	DU	2,875	57	170	227	190	112	302
Canyon Hills (Single Family and Multi-family)[3]	5278	DU	45,727	855	2,726	3,581	2,968	1,712	4,680
Marina Village Condos[3]	94	DU	546	7	34	41	33	16	49
Lakeshore Town Center (Mixed-Use Commerical)[3]	237.40	TSF	10,137	141	87	228	423	458	881
Lake Elsinore Walmart (Commerical)[3]	168.80	TSF	11,723	339	256	595	412	417	829
Alberhill Ridge (Single Family, Multi-family, Office, and Commerical)[3]			48,829	1,569	1,110	2,679	2,185	2,616	4,801
Alberhill Ranch (Single Family Res.)[3]	1986	DU	18,907	372	1,117	1,489	1,251	735	1,986
Terracina (Single Family Res.)[3]	365	DU	3,475	68	205	273	230	135	365
Alberhill Villages (All Proposed Land Uses)[3]			158,189	4,875	5,258	10,133	7,850	7,665	15,515
Wakerider (Resort)[3]	11.35	TSF	2,201	73	60	133	88	71	159
Village at Lakeshore (Multi-family)[3]	163	DU	947	12	60	72	57	28	85
Circle K (Gas Station/Car Wash)[3]	4.50	TSF	1,834	72	70	142	85	81	166
Golden Corral (Restaurant)[3]	7.80	TSF	992	46	38	84	46	31	77
La Quinta Inn (Hotel)[3]	64	RM	523	20	14	34	20	19	39
Ness Industrial Garage (Industrial)[3]	12	TSF	84	10	1	11	1	10	11
Fairway Business Park (Industrial)[3]			1,952	227	31	258	33	239	272
Trieste (Single Family Res.)[3]	75	DU	714	14	42	56	47	28	75
Central Plaza (Commerical)[3]	75	TSF	7,269	181	138	319	150	147	297
Artisan Alley (Commerical)[4]	95.1	TSF	5,543	135	105	240	283	174	457
Quickrete Plant	163.9	TSF	626	93	26	120	43	77	120
Lakeshore Senior Apartments	121	DU	416	8	16	24	16	14	30
Running Deer (Single Family Res.)	101	DU	962	19	57	76	64	37	101
Lakeview Manor (Multi-family)[5]	104	DU	685	10	38	48	39	21	60
Honda Dealership	53.4	TSF	1725	77	26	103	56	84	140
North Peak Plaza (Mixed-Use)	92	DU	535	7	34	40	32	16	48
	92	TSF	3928	55	34	88	164	177	341
Total Trip Generation			472,917	12,753	17,312	30,065	24,371	21,125	45,496

SEE APPENDIX D FOR COMPLETE CUMULATIVE PROJECT INFORMATION; Notes: TSF = Thousand Square Feet, DU = Dwelling Units, RM = Rooms

[1] All Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012.

[2] Trip generation estimates from: Scoping Agreement for Proposed Boat and Sale Manufacturing Facility on Riverside Drive, June 30, 2017.

[3] Trip generation estimates from: Central Plaza Traffic Impact Study by RK Engineering Group Inc., February 9, 2017.

[4] Trip generation estimates from: Mission Trail Apartments Project Traffic Impcat Analysis Report by LLG Inc., March 22, 2017.

[5] Trip generation estimates from: Lakeview Manor Traffic Impcat Analysis by LOS Engineering Inc., January 9, 2017.

The proposed project is expected to widen the north side of Riverside Drive along the project frontage in the future, but the specific geometrics are unknown at this time.

Table 9 provides the Existing plus Ambient Growth plus Project plus Cumulative Projects conditions for the weekday AM and PM peak hours. Detailed LOS worksheets are included in Appendix C.

As shown in Table 9, all of the study area intersection are forecast to operate at LOS D or better with the project, except for the following intersections:

- I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
- Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)
- Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
- I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
- Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

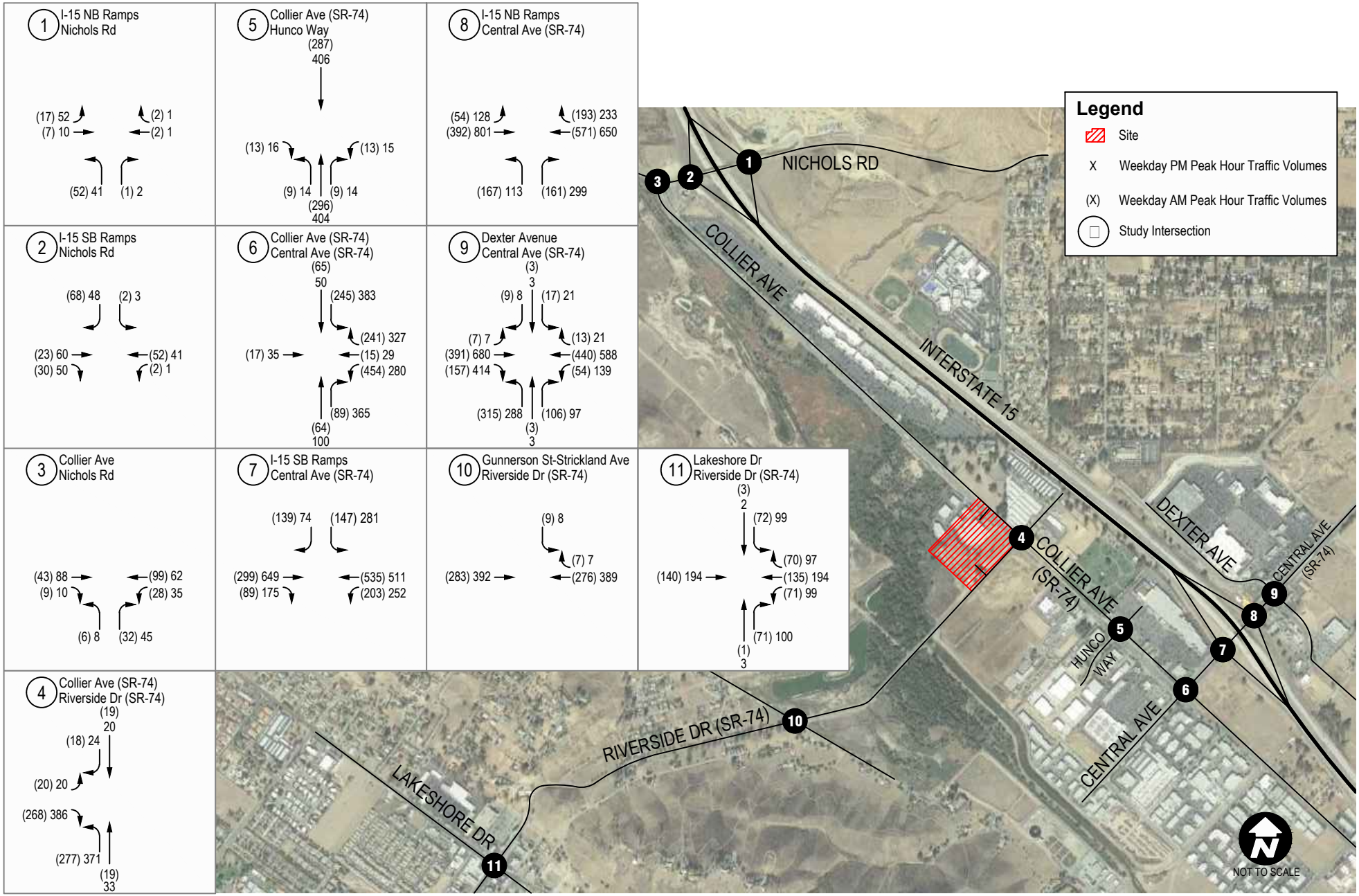
These intersections would be considered impacted as they would already contribute to an LOS that is less that the City standard of LOS D. Mitigation measures for these intersections are discussed in the mitigation section.

Table 9. Existing plus Ambient Growth plus Project plus Cumulative Projects Intersection Levels of Service

	AM Peak		PM Peak	
Intersection	**Delay[1]**	**LOS[2]**	**Delay[1]**	**LOS[2]**
1. I-15 NB Ramps/Nichols Road	**508.9**	**F**	**103.8**	**F**
2. I-15 SB Ramps/Nichols Road	20.2	C	18.1	C
3. Collier Avenue/Nichols Road	**36.3**	**E**	**115.6**	**F**
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)	18.3	B	51.8	D
5. Collier Avenue (SR-74)/Hunco Way	10.9	B	22.3	C
6. Collier Ave (SR-74)/Central Avenue (SR-74)	**70.2**	**E**	**60.4**	**E**
7. I-15 SB Ramps/Central Avenue (SR-74)	43.0	D	**96.3**	**F**
8. I-15 NB Ramps/Central Avenue (SR-74)	20.6	C	42.3	D
9. Dexter Avenue/Central Avenue (SR-74)	**57.1**	**E**	53.0	D
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**612.3**	**F**	**3328.7**	**F**
11. Lakeshore Drive/Riverside Drive (SR-74)	36.2	D	53.4	D

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.

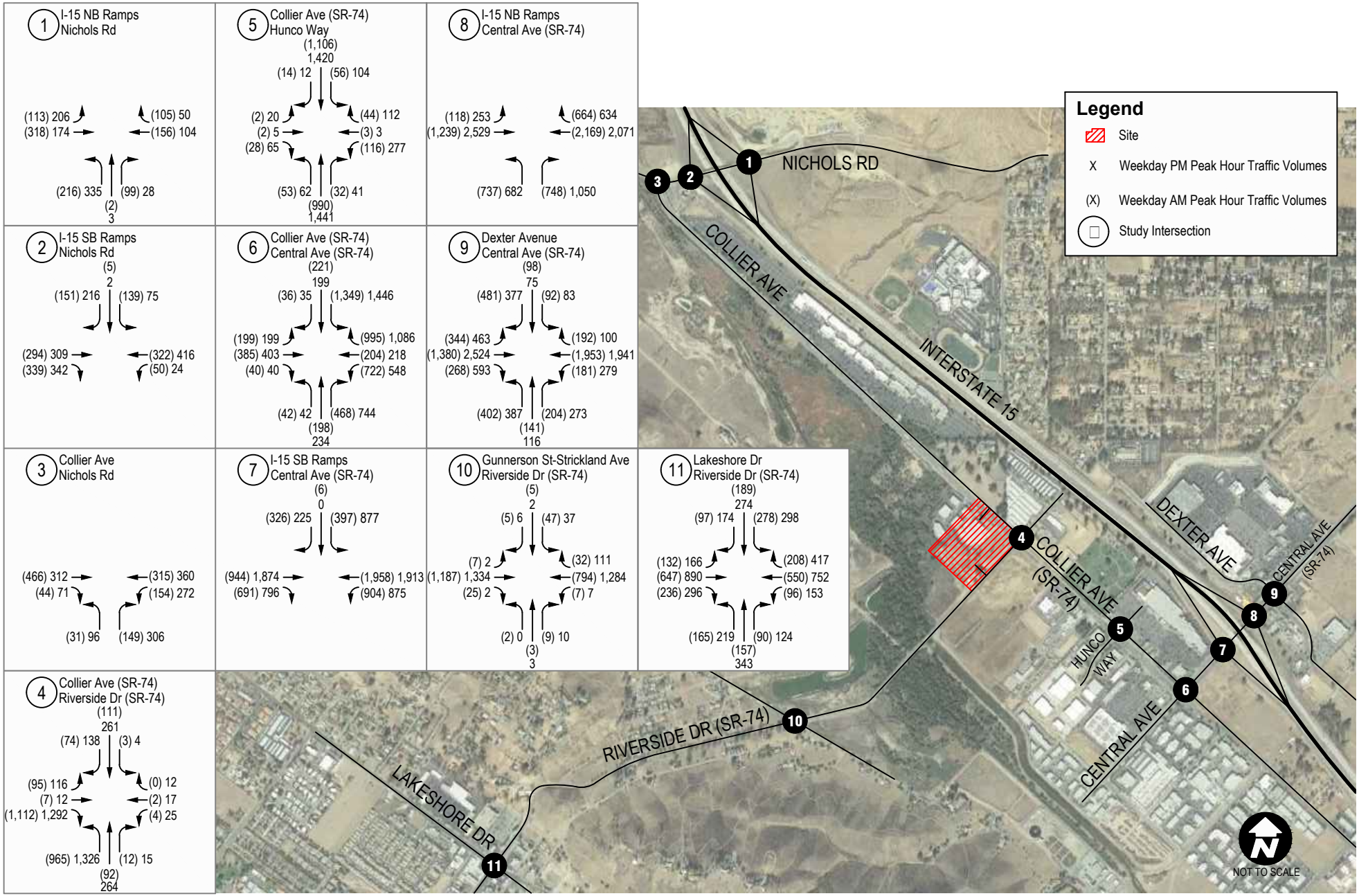


Source: Google Maps, 10/2016

Cumulative Project Traffic Volumes

Kassab Travel Center TIA

FIGURE
12



Source: Google Maps, 10/2016

E□isting plus □m□ient Gro□t□ plus Cumulative Projects plus Project Pea□ □our Tra□ic Volumes

FIGURE 13

Kassab Travel Center TIA

Chapter 7. Roadway Segment Analysis

The project is forecast to generate a net of approximately 1,919 average daily trips. A average daily traffic (ADT) roadway segment analysis for the following segments was conducted, based on input from City Staff:

- Riverside Drive (SR-74), west of Collier Avenue
- Collier Avenue, north of Riverside Drive (SR-74)
- Collier Avenue, south of Riverside Drive (SR-74)

Traffic volumes for Collier Avenue, north of Riverside Drive (SR-74) were collected in May 2017. Traffic volumes for Collier Avenue between Riverside Drive (SR-74) and Central Avenue were collected in June 2017. Traffic volumes for Riverside Drive (SR-74), west of Collier Drive were collected in August 2017. This count data is provided in Appendix B.

The ADT analysis for the Existing and Existing plus Project conditions are shown in Table 10, while the ADT analysis for the Existing and Existing plus Ambient Growth plus Project conditions are shown in Table 11. The ADT analysis for the Existing plus Ambient Growth plus Project plus Cumulative Projects condition is shown in Table 12. Per the City's General Plan, LOS D is the minimum acceptable standard used for this analysis. Additionally, Riverside Drive (SR-74), west of Collier Avenue was adjusted to account for two lanes.

Table 10. Existing and Existing plus Project ADT Analysis

Roadway Segments	Roadway Classification	LOS Standard E[1]	Existing		Existing plus Project	
			ADT	LOS	ADT	LOS
Riverside Drive (SR-74), west of Collier Avenue	Urban Arterial[2]	17,950	26,360	E-F	26,900	E-F [3]
Collier Avenue, north of Riverside Drive (SR-74)	Major	34,100	6,540	C	7,344	C
Collier Avenue, south of Riverside Drive (SR-74)	Urban Arterial	35,900	27,790	A-C	28,846	D

[1] Standard obtained via Figure C-3, County of Riverside General Plan Circulation Element, March 2014. Using LOS E per City Standards. LOS E value is transition point between LOS D and LOS E.

[2] Adjusted for 2 lanes, not 4 as shown in Figure C-3 of County Circulation Element.

[3] Project would add second WB lane along its frontage, for a total of three through lanes (2 WB and 1 EB).

As shown in Tables 10, 11, and 12, all segments operate at LOS D or better and would operate within the City's standard of LOS D, except for Riverside Drive (SR-74), west of Collier Avenue. This segment is currently operating at LOS E-F under existing conditions, and is forecast to continue to operate at LOS E-F under Existing plus Ambient Growth plus Project Conditions, as well as with the addition of traffic from cumulative projects (Existing plus Ambient Growth plus Project plus Cumulative Projects). Collier Avenue, south of Riverside Drive (SR-74) in the Existing plus Ambient Growth plus Project plus Cumulative Projects condition is forecast to degrade to LOS F with the addition of Cumulative Project traffic.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction).

The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

Table 11. Existing and Existing plus Ambient Growth plus Project ADT Analysis

Roadway Segments	Roadway Classification	LOS Standard E[1]	Existing		Existing plus Ambient plus Project	
			ADT	LOS	ADT	LOS
Riverside Drive (SR-74), west of Collier Avenue	Urban Arterial[2]	17,950	26,360	E-F	27,980	E-F [3]
Collier Avenue, north of Riverside Drive (SR-74)	Major	34,100	6,540	C	7,640	C
Collier Avenue, south of Riverside Drive (SR-74)	Urban Arterial	35,900	27,790	A-C	30,000	D

[1] Standard obtained via Figure C-3, County of Riverside General Plan Circulation Element, March 2014. Using LOS E per City Standards. LOS E value is transition point between LOS D and LOS E.

[2] Adjusted for 2 lanes, not 4 as shown in Figure C-3 of County Circulation Element.

[3] Project would add second WB lane along its frontage, for a total of three through lanes (2 WB and 1 EB).

Table 12. Existing plus Ambient Growth plus Project plus Cumulative Projects ADT Analysis

Roadway Segments	Roadway Classification	LOS Standard E [1]	Existing plus Ambient plus Cumulative plus Project	
			ADT	LOS
Riverside Drive (SR-74), west of Collier Avenue	Urban Arterial [2]	17,950	36,809	E-F [3]
Collier Avenue, north of Riverside Drive (SR-74)	Major	34,100	8,683	A-C
Collier Avenue, south of Riverside Drive (SR-74)	Urban Arterial	35,900	38,844	F

[1] Standard obtained via Figure C-3, County of Riverside General Plan Circulation Element, March 2014. Using LOS E per City Standards. LOS E value is transition point between LOS D and LOS E.

[2] Adjusted for 2 lanes, not 4 as shown in Figure C-3 of County Circulation Element.

[3] Project would add second WB lane along its frontage, for a total of three through lanes (2 WB and 1 EB).

The roadway segment of Riverside Drive west of Collier Avenue is part of the TUMF network and will be improved to its ultimate width using those funds. However, with the improvements listed above, and the addition of project traffic (approximately 540 ADT), this segment of Riverside Drive (SR-74) is forecast to continue to operate at LOS E-F under both conditions.

Chapter 8. Special Issues: Queuing, Collier Avenue/Riverside Drive Geometry, Truck Turn Radii, Class II Bike Lane, and Pedestrian Safety Analyses

This section documents the following special issues requested to be addressed by City staff and Caltrans:

- Intersection queuing
- Collier Avenue (SR-74)/Riverside Drive (SR-74) conceptual geometry
- On-site truck turn radii
- Class II bicycle lane on Riverside Drive (SR-74)
- Pedestrian safety analysis

Queuing Analysis

A queuing analysis was conducted to determine the vehicle queues for turning movements at the study area intersections. In addition, the queuing analysis illustrates how much the queuing might increase with the addition of traffic from the proposed project. The queuing analysis is based on the Synchro LOS analysis which reports the 95th percentile (design) queues, consistent with HCM 2010.

Existing plus Project

Table 13 presents the queuing analysis for the Existing and Existing plus Project scenario. This table also illustrates the existing turning pocket length, if available, and the change in the queue length with the addition of the project. It should be noted that all of the queue lengths shown below are also exceeded in the Existing (without project) condition. As shown in Table 13, the following intersections/movements are expected to exceed the existing turn pocket (queue storage) length in the Existing plus Project condition:

- I-15 NB Ramps/Nichols Road
  - NBR pocket length = 50', queue length = 76'
- I-15 SB Ramps/Nichols Road
  - SBR pocket length = 50', queue length = 67'
- Collier Avenue (SR-74)/Hunco Way
  - SBL pocket length = 220', queue length = 265'
- Collier Avenue (SR-74)/Central Avenue (SR-74)
  - EBL pocket length = 150', queue length = 179'
  - NBL pocket length = 100', queue length = 127'
  - NBR pocket length = 50', queue length = 85'
- I-15 SB Ramps/Central Avenue (SR-74)
  - SBL pocket length = 100', queue length = 149'
  - SBR pocket length = 100', queue length = 165'

Table 13. Existing and Existing plus Ambient Growth plus Project Queuing Analysis

			Existing		Existing Plus Project		Change		Exceeds Turn Pocket Length?	
Intersection	Movement	Existing Pocket Length (feet)	AM	PM	AM	PM	AM	PM	AM	PM
1. I-15 NB Ramps/Nichols Rd										
	EBL	275	41	40	46	44	5	4	No	No
	NBR	50	71	56	76	54	5	-2	Yes	Yes
2. I-15 SB Ramps/Nichols Rd										
	EBR	150	88	62	82	57	-6	-5	No	No
	WBL	280	47	41	48	40	1	-1	No	No
	SBR	50	49	65	58	67	9	2	Yes	Yes
3. Collier Ave (SR-74)/Nichols Rd										
	WBL	135	51	56	55	61	4	5	No	No
4. Collier Ave (SR-74)/Riverside Dr (SR-74)										
	EBL[1]	0	69	96	80	107	11	11	No	No
	EBR[1]	0	157	467	203	578	46	111	No	No
	SBL[2]	6000	11	12	78	292	67	280	No	No
5. Collier Ave (SR-74)/Hunco Way										
	WBL[1]	0	90	174	83	188	-7	14	No	No
	WBR[1]	0	36	63	39	83	3	20	No	No
	NBL	250	52	159	50	180	-2	21	No	No
	SBL	220	67	158	52	265	-15	107	No	Yes
6. Collier Ave (SR-74)/Central Avenue (SR-74)										
	EBL	150	91	100	179	167	88	67	Yes	Yes
	WBL[1]	0	125	100	141	106	16	6	No	No
	NBL	100	116	97	127	118	11	21	Yes	Yes
	NBR	50	82	84	82	85	0	1	Yes	Yes
	SBL	900	331	734	536	804	205	70	No	No
7. I-15 SB Ramps/Central Ave (SR-74)										
	EBR[1]	0	251	250	259	275	8	25	No	No
	WBL	400	218	153	226	178	8	25	No	No
	SBL	100	123	161	126	149	3	-12	Yes	Yes
	SBR	100	127	164	140	165	13	1	Yes	Yes
8. I-15 NB Ramps/Central Ave (SR-74)										
	EBL	250	85	121	92	126	7	5	No	No
	NBL	100	173	172	171	175	-2	3	Yes	Yes
	NBR	100	110	159	109	162	-1	3	Yes	Yes
9. Dexter Ave/Central Ave (SR-74)										
	EBL[1]	0	260	147	247	178	-13	31	No	No
	EBR[1]	0	47	47	53	57	6	10	No	No
	WBL	200	161	182	135	157	-26	-25	No	No
	WBR	300	130	227	127	205	-3	-22	No	No
	NBL	120	123	139	133	142	10	3	Yes	Yes
	SBL	175	133	80	110	75	-23	-5	No	No
	SBR	150	187	126	188	131	1	5	Yes	No
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)										
	EBL	50	16	12	15	0	-1	-12	No	No
	WBL	50	17	16	22	18	5	2	No	No
	NBR	50	5	7	0	5	-5	-2	No	No
	SBR	50	16	23	19	27	3	4	No	No
11. Lakeshore Drive/Riverside Dr (SR-74)										
	EBL	150	150	195	193	199	43	4	Yes	Yes
	EBR	225	62	312	106	341	44	29	No	Yes
	WBL	160	64	155	86	142	22	-13	No	No
	NBL	130	138	182	149	185	11	3	Yes	Yes
	SBL	150	159	187	173	204	14	17	Yes	Yes
	SBR[1]	0	54	73	53	76	-1	3	No	No

[1] No turn pocket length.

[2] In Plus Project condition, movement will be shared with a through lane.

- I-15 NB Ramps/Central Avenue (SR-74)

  - NBL pocket length = 100', queue length = 175'
  - NBR pocket length = 100', queue length = 162'
- Dexter Avenue/Central Avenue (SR-74)
  - NBL pocket length = 120', queue length = 142'
- SBR pocket length = 150', queue length = 188'Lakeshore Drive/Riverside Drive (SR-74)
  - EBL pocket length = 150', queue length = 199'
  - EBR pocket length = 225', queue length = 341'
  - NBL pocket length = 130', queue length = 185'
    SBL pocket length = 150', queue length = 204'

Existing plus Ambient Growth plus Project

Table 14 presents the queuing analysis for the Existing and Existing plus Ambient Growth plus Project scenario. This table also illustrates the existing turning pocket length, if available, and the change in the queue length with the addition of the project. It should be noted that all of the queue lengths shown below are also exceeded in the Existing (without project) condition. As shown in Table 14, the following intersections/movements are expected to exceed the existing turn pocket (queue storage) length in the Existing plus Ambient Growth plus Project condition:

- I-15 NB Ramps/Nichols Road
  - NBR pocket length = 50', queue length = 81'
- I-15 SB Ramps/Nichols Road
  - SBR pocket length = 50', queue length = 70'
- Collier Avenue (SR-74)/Hunco Way
  - NBL pocket length = 250', queue length = 270'
  - SBL pocket length = 220', queue length = 326'
- Collier Avenue (SR-74)/Central Avenue (SR-74)
  - EBL pocket length = 150', queue length = 181'
  - NBR pocket length = 50', queue length = 86'
- I-15 SB Ramps/Central Avenue (SR-74)
  - SBL pocket length = 100', queue length = 155'
  - SBR pocket length = 100', queue length = 170'

Table 14. Existing and Existing plus Ambient Growth plus Project Queuing Analysis

			Existing		Existing Plus Ambient Plus Project		Change		Exceeds Turn Pocket Length?	
Intersection	Movement	Existing Pocket Length (feet)	AM	PM	AM	PM	AM	PM	AM	PM
1. I-15 NB Ramps/Nichols Rd										
	EBL	275	41	40	49	46	8	6	No	No
	NBR	50	71	56	81	65	10	9	Yes	Yes
2. I-15 SB Ramps/Nichols Rd										
	EBR	150	88	62	107	59	19	-3	No	No
	WBL	280	47	41	47	66	0	25	No	No
	SBR	50	49	65	65	70	16	5	Yes	Yes
3. Collier Ave (SR-74)/Nichols Rd										
	WBL	135	51	56	57	98	6	42	No	No
4. Collier Ave (SR-74)/Riverside Dr (SR-74)										
	EBL[1]	0	69	96	83	265	14	169	No	No
	EBR[1]	0	157	467	196	996	39	529	No	No
	SBL[2]	6000	11	12	88	934	77	922	No	No
5. Collier Ave (SR-74)/Hunco Way										
	WBL[1]	0	90	174	94	222	4	48	No	No
	WBR[1]	0	36	63	41	96	5	33	No	No
	NBL	250	52	159	56	270	4	111	No	Yes
	SBL	220	67	158	60	326	-7	168	No	Yes
6. Collier Ave (SR-74)/Central Avenue (SR-74)										
	EBL	150	91	100	181	181	90	81	Yes	Yes
	WBL[1]	0	125	100	137	101	12	1	No	No
	NBL	100	116	97	60	72	-56	-25	No	No
	NBR	50	82	84	85	86	3	2	Yes	Yes
	SBL	900	331	734	523	738	192	4	No	No
7. I-15 SB Ramps/Central Ave (SR-74)										
	EBR[1]	0	251	250	273	254	22	4	No	No
	WBL	400	218	153	239	166	21	13	No	No
	SBL	100	123	161	121	155	-2	-6	Yes	Yes
	SBR	100	127	164	140	170	13	6	Yes	Yes
8. I-15 NB Ramps/Central Ave (SR-74)										
	EBL	250	85	121	85	131	0	10	No	No
	NBL	100	173	172	172	171	-1	-1	Yes	Yes
	NBR	100	110	159	107	163	-3	4	Yes	Yes
9. Dexter Ave/Central Ave (SR-74)										
	EBL[1]	0	260	147	262	177	2	30	No	No
	EBR[1]	0	47	47	45	51	-2	4	No	No
	WBL	200	161	182	179	215	18	33	No	Yes
	WBR	300	130	227	138	354	8	127	No	Yes
	NBL	120	123	139	130	132	7	-7	Yes	Yes
	SBL	175	133	80	109	86	-24	6	No	No
	SBR	150	187	126	190	139	3	13	Yes	No
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)										
	EBL	50	16	12	13	27	-3	15	No	No
	WBL	50	17	16	22	24	5	8	No	No
	NBR	50	5	7	0	10	-5	3	No	No
	SBR	50	16	23	0	23	-16	0	No	No
11. Lakeshore Drive/Riverside Dr (SR-74)										
	EBL	150	150	195	178	209	28	14	Yes	Yes
	EBR	225	62	312	160	298	98	-14	No	Yes
	WBL	160	64	155	95	137	31	-18	No	No
	NBL	130	138	182	141	183	3	1	Yes	Yes
	SBL	150	159	187	169	198	10	11	Yes	Yes
	SBR[1]	0	54	73	58	88	4	15	No	No

[1] No turn pocket length.

[2] In Plus Project condition, movement will be shared with a through lane.

- I-15 NB Ramps/Central Avenue (SR-74)
  - NBL pocket length = 100', queue length = 171'
  - NBR pocket length = 100', queue length = 163'
- Dexter Avenue/Central Avenue (SR-74)
  - WBL pocket length = 200', queue length = 215'
  - WBR pocket length = 300', queue length = 354'
  - NBL pocket length = 120', queue length = 132'
  - SBR pocket length = 150', queue length = 190'
- Lakeshore Drive/Riverside Drive (SR-74)
  - EBL pocket length = 150', queue length = 209'
  - EBR pocket length = 225', queue length = 298'
  - NBL pocket length = 130', queue length = 183'
  - SBL pocket length = 150', queue length = 198'

Existing plus Ambient Growth plus Project plus Cumulative Projects

Table 15 presents the queuing analysis for the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario. This table also illustrates the existing turning pocket length, if available, and the change in the queue length with the addition of the project. It should be noted that most of the queue lengths shown below are also exceeded in the Existing condition. As shown in Table 15, the following intersections/movements are expected to exceed the existing turn pocket (queue storage) length in the Existing plus Ambient Growth plus Project plus Cumulative Projects condition:

- I-15 NB Ramps/Nichols Road
  - NBR pocket length = 50', queue length = 86'
- I-15 SB Ramps/Nichols Road
  - SBR pocket length = 50', queue length = 85'
- Collier Avenue/Nichols Road
  - WBL pocket length = 135', queue length = 231'
- Collier Avenue (SR-74)/Hunco Way
  - NBL pocket length = 250', queue length = 279'
  - SBL pocket length = 220', queue length = 312'
- Collier Avenue (SR-74)/Central Avenue (SR-74)
  - EBL pocket length = 150', queue length = 207'
  - NBL pocket length = 100', queue length = 106'
  - NBR pocket length = 50', queue length = 78'
- I-15 SB Ramps/Central Avenue (SR-74)
  - SBL pocket length = 100', queue length = 171'
  - SBR pocket length = 100', queue length = 169'
- I-15 NB Ramps/Central Avenue (SR-74)
  - NBL pocket length = 100', queue length = 168'
  - NBR pocket length = 100', queue length = 154'

Table 15. Existing plus Ambient Growth plus Project plus Cumulative Queuing Analysis

Intersection	Movement	Existing Pocket Length (feet)	Existing Plus Ambient Plus Cumulative Plus Project		Exceeds Turn Pocket Length?	
			AM	PM	AM	PM
1. I-15 NB Ramps/Nichols Rd						
	EBL	275	60	46	No	No
	NBR	50	86	55	Yes	Yes
2. I-15 SB Ramps/Nichols Rd						
	EBR	150	119	77	No	No
	WBL	280	49	170	No	No
	SBR	50	71	85	Yes	Yes
3. Collier Ave (SR-74)/Nichols Rd						
	WBL	135	66	201	No	Yes
4. Collier Ave (SR-74)/Riverside Dr (SR-74)						
	EBL[1]	0	106	235	No	No
	EBR[1]	0	375	986	No	No
	SBL[2]	6000	122	1305	No	No
5. Collier Ave (SR-74)/Hunco Way						
	WBL[1]	0	88	474	No	No
	WBR[1]	0	40	242	No	No
	NBL	250	58	279	No	Yes
	SBL	220	133	312	No	Yes
6. Collier Ave (SR-74)/Central Avenue (SR-74)						
	EBL	150	203	207	Yes	Yes
	WBL[1]	0	310	197	No	No
	NBL	100	106	100	Yes	No
	NBR	50	78	76	Yes	Yes
	SBL	900	735	710	No	No
7. I-15 SB Ramps/Central Ave (SR-74)						
	EBR[1]	0	347	368	No	No
	WBL	400	218	367	No	No
	SBL	100	169	171	Yes	Yes
	SBR	100	169	155	Yes	Yes
8. I-15 NB Ramps/Central Ave (SR-74)						
	EBL	250	142	169	No	No
	NBL	100	168	157	Yes	Yes
	NBR	100	128	154	Yes	Yes
9. Dexter Ave/Central Ave (SR-74)						
	EBL[1]	0	295	227	No	No
	EBR[1]	0	48	118	No	No
	WBL	200	274	263	Yes	Yes
	WBR	300	425	343	Yes	Yes
	NBL	120	147	146	Yes	Yes
	SBL	175	150	122	No	No
	SBR	150	202	185	Yes	Yes
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)						
	EBL	50	18	19	No	No
	WBL	50	22	15	No	No
	NBR	50	12	8	No	No
	SBR	50	41	25	No	No
11. Lakeshore Drive/Riverside Dr (SR-74)						
	EBL	150	227	250	Yes	Yes
	EBR	225	326	356	Yes	Yes
	WBL	160	177	193	Yes	Yes
	NBL	130	147	181	Yes	Yes
	NBR	300	84	334	No	Yes
	SBL	150	199	178	Yes	Yes
	SBR[1]	0	52	63	No	No

[1] No turn pocket length.

[2] In Plus Project condition, movement will be shared with a through lane.

- Dexter Avenue/Central Avenue (SR-74)
    - WBL pocket length = 200', queue length = 274'
    - WBR pocket length = 300', queue length = 425'
    - NBL pocket length = 120', queue length = 147'
    - SBR pocket length = 150', queue length = 202'
- Lakeshore Drive/Riverside Drive (SR-74)
    - EBL pocket length = 150', queue length = 250'
    - EBR pocket length = 225', queue length = 356'
    - WBL pocket length = 160', queue length = 193'
    - NBL pocket length = 130', queue length = 181'
    - NBR pocket length = 300', queue length = 334'
    - SBL pocket length = 150', queue length = 199'

Collier Avenue (SR-74)/Central Avenue (SR-74) Conceptual Geometry

Per the City's General Plan Roadway Classifications (Figure 2.3 of General Plan), Collier Avenue, north of Riverside Drive (along the project's frontage), is classified as a Major roadway with four lanes and a 100 foot right-of-way (80 feet, curb-to-curb). Riverside Drive (SR-74), west of Collier Avenue (along the project's frontage), is classified as an Urban Arterial with six lanes and a 120 foot right-of-way (96 feet, curb-to-curb). Figure 3 above, illustrates the street cross sections for a Major roadway and Urban Arterial.

Currently, Collier Avenue, along the project's frontage, is not constructed to its ultimate Major roadway width of 80 feet, curb-to-curb. It is approximately 76 feet, curb-to-curb. Based on review of the project site plan, the proposed project will dedicate approximately 10 feet in order to allow their half-section of Collier Avenue to be consistent with the Major roadway (half) cross section (center median, two travel lanes, six foot bike lane, and 5 foot sidewalk – in one direction). Street improvements on the west side of Collier Avenue, along the project's frontage, will conform with City roadway design standards.

These improvements will be constructed to be consistent with the General Plan and the City's Standard Plans.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). With the street dedication on the north side (project frontage), the pavement width would be approximately 74 feet (48 feet from curb face to new centerline, plus 26 feet of existing pavement on the south side of the street). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.

On-site Truck Turning Radii

As shown in the project site plan above (Figure 2), truck turning templates for a semi-trailer truck (heavy truck) or fuel transport truck have been placed on the two driveways (driveway on Riverside Drive, and driveway on Collier Avenue). The truck turning templates have also been placed at the (underground) fuel storage tanks on site. All truck turning templates show there is adequate space on the project site for a large trailer truck and recreational vehicles (RVs) to maneuver through the site, and through the primary driveways.

Furthermore, the proposed project is not designed, nor intended, to serve heavy, long-haul trucks, but mainly to serve local residents, visitors, and RVs traveling through the area (on I-15 or SR-74). Also, fuel distribution trucks typically arrive at the site to refill the underground storage tanks during the off-peak hours of the business (i.e., late nights, or early mornings).

Class II Bicycle Lane on Riverside Drive (SR-74)

As previously discussed, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). With the street dedication on the north side (project frontage), the pavement width would be approximately 74 feet (48 feet from curb face to new centerline, plus 26 feet of existing pavement on the south side of the street). Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, include a new six foot wide bike lane (Class (II – striped, on-pavement) consistent with the City's General Plan Circulation Element.

Pedestrian Safety Analysis

As shown on the project site plan (Figure 2), pedestrian facilities, in the form of sidewalks, are proposed along the project's frontages on Collier Avenue and Riverside Drive. These sidewalks are shown to be 5 feet in width on Collier Avenue and 6 feet in width on Riverside Drive; and, will be constructed to be consistent with Caltrans and the City's Standard Plans. The proposed sidewalk on the west side of Collier Avenue would connect to the existing sidewalk north of the project site, which provides continuous pedestrian access to the adjacent retail and industrial uses, including the Outlets at Lake Elsinore, further to the north. The proposed sidewalk on the north side of Riverside Drive would be constructed just along the project frontage, as there are no other existing pedestrian facilities to connect with west of the project site.

On site, pedestrian connections, in the form of landscape cut-outs connected to striped crosswalks, are provided adjacent to the gas station convenience mart (on Collier Avenue), and adjacent to the fast-food restaurant (on Riverside Drive). Pedestrians using these connections from the sidewalks on Collier Avenue and Riverside Drive would have direct access to those buildings. Additionally, pedestrian crosswalks and internal sidewalks are provided from each building (convenience mart and fast-food restaurant) to their respective trash enclosure areas. The locations of these crosswalks provide the shortest path from the buildings to the trash enclosures, reducing the length of time employees are in vehicle paths while going to the trash enclosures.

Furthermore, the on-site parking areas have been designed to be as close to the buildings as possible, and the buildings have surrounding sidewalks to keep patrons off the vehicle drive aisles.

Chapter 9. Mitigation Measures and Fair-Share

This section discusses the mitigation measures and fair share costs for the impacted intersections discussed in the previous sections. As mentioned before, the project impacts the following intersections under the Existing plus Project scenario:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Project is 100% responsible for improvements to mitigate impact
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The project impacts the following intersections under the Existing plus Ambient Growth plus Project scenario:

- I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
    - Project is 100% responsible for improvements to mitigate impact
- Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Project is 100% responsible for improvements to mitigate impact
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

The project impacts the following intersections under the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario:

- I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
- Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
- I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
- Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

These intersections will be required to be mitigated to a level of less than significant per the City's significance criteria. The fair share calculations will be assessed with the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario. The mitigation measures for the Existing plus Project and Existing plus Ambient Growth plus Project conditions and the Existing plus Ambient Growth plus Project plus Cumulative projects condition are listed in Figures 14 and 15, respectively.

The incorporation of the mitigation measures defined below would reduce the proposed project's impacts to a level of less than significant per the City's significance criteria.

Existing plus Project

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:

    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during the PM peak hour.

Table 16 presents the LOS (improvement) with the implementation of the mitigation measures listed above for the Existing plus Project condition.

Existing plus Ambient Growth plus Project

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:

- I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS B during the PM peak hour.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the PM peak hour.

.
Table 17 presents the LOS (improvement) with the implementation of the mitigation measures listed above for the Existing plus Ambient Growth plus Project condition.

Existing plus Ambient Growth plus Project plus Cumulative Projects

Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the AM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during both the AM and PM.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
    - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS C during the PM peak hour.
- Collier Avenue (SR-74)/Riverside Drive (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Restripe two southbound through lanes to one southbound through and one southbound through-left lane. With this mitigation, the intersection is forecast to operate at LOS D during both the AM and PM peak hour.
- I-15 SB Ramps/Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Install a third eastbound through lane and install a second (dual) southbound left turn lane. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Dexter Avenue /Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
    - Change northbound left turn phasing to protected-permitted. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) –The following improvement is needed to mitigate intersection LOS:
    - Convert this intersection into a signalized intersection when the traffic volumes would satisfy signal warrants. With this mitigation, the intersection is forecast to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

Table 18 presents the LOS (improvement) with the implementation of the mitigation measures listed above for the Existing plus Ambient Growth plus Project plus Cumulative Projects condition.

Table 16. Existing plus Project LOS with Mitigation Measures

	Existing plus Project				Mitigated				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**148.5**	**F**	27.6	D	24.0	C	--	--	-124.5	--	NO	NO
3. Collier Avenue/Nichols Road	21.8	C	**35.9**	**E**	--	--	14.3	B	--	-21.6	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**65.9**	**F**	**217.8**	**F**	8.0	A	8.9	A	-57.9	-208.9	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010. Unless otherwise noted.

Table 17. Existing plus Ambient Growth plus Project LOS with Mitigation Measures

	Existing plus Ambient Growth plus Project				Mitigated				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**228.7**	**F**	**37.7**	**E**	29.7	D	13.1	B	-199.0	-24.6	NO	NO
3. Collier Avenue/Nichols Road	23.8	C	**44.0**	**E**	--	--	15.4	C	--	-28.6	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**83.0**	**F**	**314.2**	**F**	8.6	A	9.9	A	-74.4	-304.3	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010. Unless otherwise noted.

Table 18. Existing plus Ambient Growth plus Project plus Cumulative Projects LOS with Mitigation Measures

	Existing plus Ambient Growth plus Cumulative Project				Mitigated				Delay Change		Impact	
	AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
Intersection	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]				
1. I-15 NB Ramps/Nichols Road	**508.9**	**F**	**103.8**	**F**	13.4	B	11.5	B	-495.5	-92.3	NO	NO
3. Collier Avenue/Nichols Road	**36.3**	**E**	**115.6**	**F**	27.4	D	22.8	C	-8.9	-92.8	NO	NO
6. Collier Ave (SR-74)/Central Avenue (SR-74)	**70.2**	**E**	**60.4**	**E**	45.8	D	36.9	D	-24.4	-23.5	NO	NO
7. I-15 SB Ramps/Central Avenue (SR-74)	43.0	D	**96.3**	**F**	--	--	35.0	C	--	-61.3	NO	NO
9. Dexter Avenue/Central Avenue (SR-74)	**57.1**	**E**	53.0	D	44.9	D	--	--	-12.2	--	NO	NO
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)	**612.3**	**F**	**3328.7**	**F**	11.7	B	27.3	C	-600.6	--	NO	NO

[1] Seconds/Vehicle

[2] Level of Service, based on Highway Capacity Manual HCM 2010.

Project Fair Share Costs

The following section discusses the project's fair share costs for the improvements noted above. The fair share calculation is based on the following formula, and uses the Existing plus Ambient Growth plus Project plus Cumulative Projects condition:

$$\frac{Project\ Traffic}{Opening\ Year + Project - Existing\ Traffic}$$

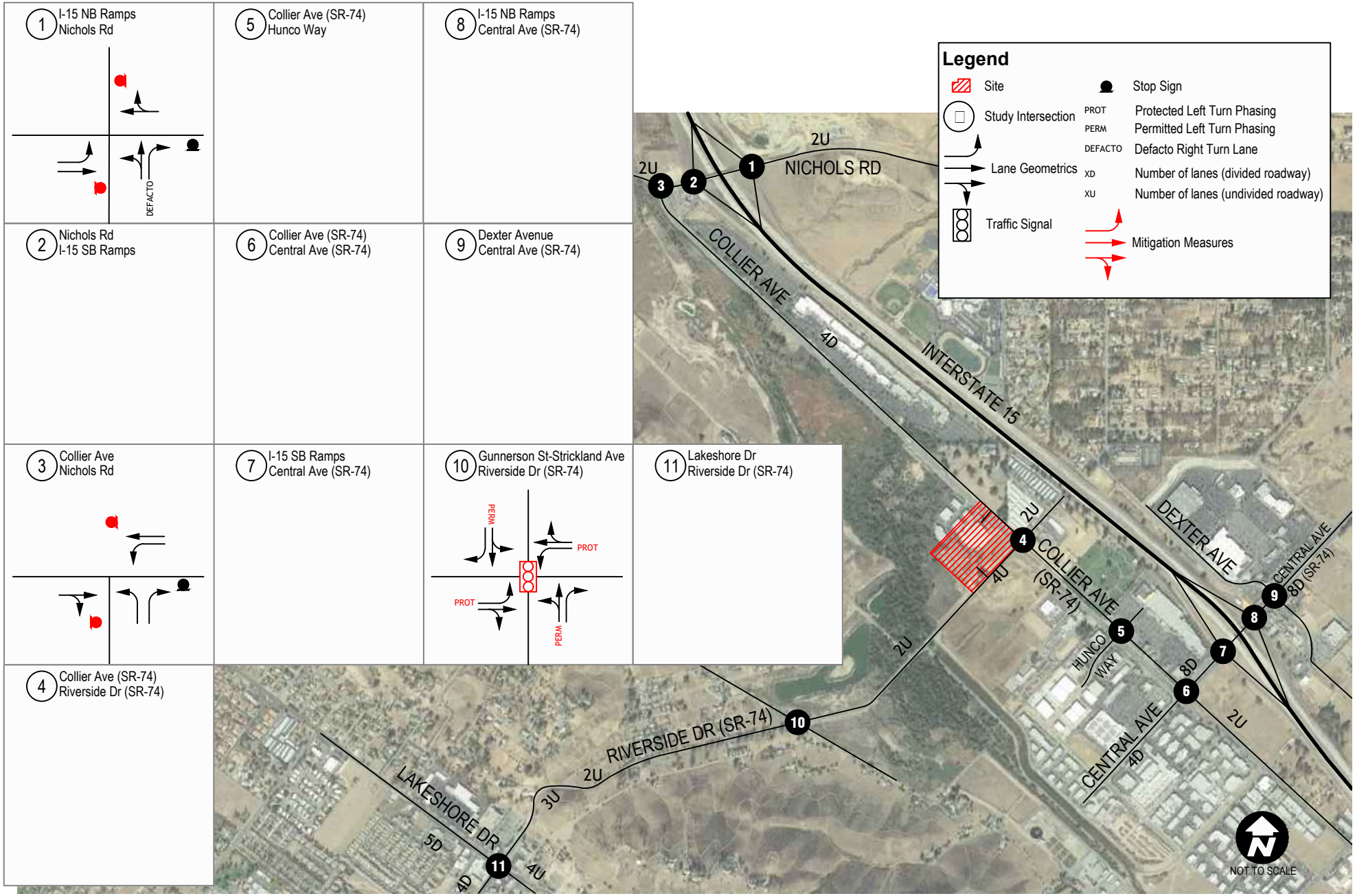
As shown in Table 19, the project fair share ranges from 0.9 percent to 12.5 percent. It is expected that the project is expected to pay its fair share costs for the mitigation measures noted previously.

A similar calculation was conducted for the impacted roadway segment of Collier Avenue, south of Riverside Drive (SR-74). Based on the daily traffic volumes shown in Table 11, the project's fair share would be 9.6 percent (1,056 Project ADT/ (38,844 – 27,790)). Another calculation was conducted for Riverside Drive (SR-74), west of Collier Avenue. Based on the daily traffic volumes shown in Table 11, the project's fair share would be 5.2 percent (540 Project ADT/ (36,809 – 26,360. The roadway segment of Riverside Drive west of Collier Avenue is part of the TUMF network and is to be improved to its ultimate width using those funds.

Table 19. Project Fair Share

Existing Plus Ambient Growth Plus Cumulative Plus Project	AM Peak				PM Peak			
Intersection	Project Traffic	Cumulative Plus Project	Existing	Fair Share %[1]	Project Traffic	Cumulative Plus Project	Existing	Fair Share %[1]
1. I-15 NB Ramps/Nichols Rd	19	1009	854	12.3%	22	900	724	12.5%
3. Collier Ave/Nichols Rd	39	1159	848	12.5%	45	1417	1057	12.5%
4. Collier Ave (SR-74)/Riverside Dr (SR-74)	81	2477	1668	10.0%	92	3482	2387	8.4%
6. Collier Ave (SR-74)/Central Ave (SR-74)	71	4859	3452	5.0%	81	5194	3400	4.5%
7. I-15 SB Ramps/Central Ave (SR-74)	68	5226	3531	4.0%	77	6560	4281	3.4%
9. Dexter Avenue/Central Ave (SR-74)	20	5736	3956	1.1%	22	7211	4637	0.9%
10. Gunnerson St-Strickland Ave/Riverside Dr (SR-74)	20	2123	1462	3.0%	22	2798	1897	2.4%

[1] Project Traffic/(Existing + Ambient Growth + Cumulative + Project - Existing Traffic)

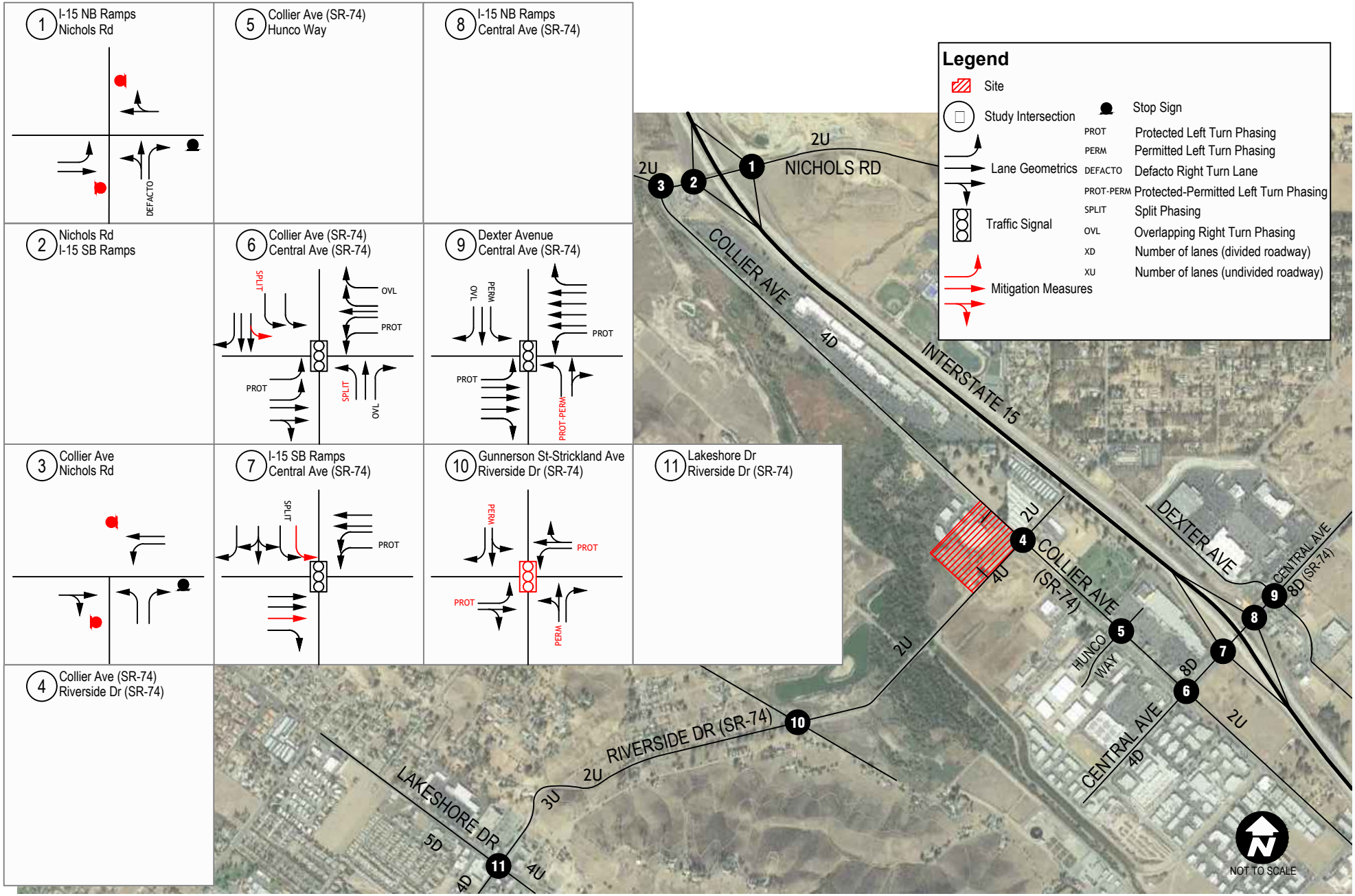


Source: Google Maps, 10/2016

Mitigation Measures □or E□isting plus Project □ E□isting plus □m□ient Gro□t□ plus Project Scenarios

FIGURE **14**

Kassab Travel Center TIA



Source: Google Maps, 10/2016

Mitigation Measures □or E□isting plus □m□ient Gro□t□ plus Project plus Cumulative Projects Scenario

FIGURE 15

Kassab Travel Center TIA

Chapter 10. Findings and Recommendations

This chapter of the transportation impact study summarizes the project traffic analysis for the proposed Kassab Travel Center in the City of Lake Elsinore. General findings and recommendations include:

- The proposed project is proposing an 18 fueling position gas station with convenience mart; and, a 2,543 square foot fast-food restaurant with a drive-through. This project is expected to generate a net of 1,919 daily trips, 129 AM peak hour trips (65 inbound and 64 outbound), and 148 PM peak hour trips (75 inbound and 73 outbound).

- Under the Existing plus Project conditions, the following intersections would be impacted as they would operate below the City's LOS standard of LOS D:
    - I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour)
    - Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

- Under the Existing plus Ambient Growth plus Project conditions, the following intersections would be impacted as they would operate below the City's LOS standard of LOS D:
    - I-15 NB Ramps/Nichols Road (remains at LOS F during the AM peak hour, LOS D to LOS E during the PM peak hour)
    - Collier Avenue/Nichols Road (LOS D to LOS E during the PM peak hour)
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (remains at LOS F during both peak hours)

- Under the Existing plus Ambient Growth plus Project plus Cumulative Projects condition, the following intersections would be impacted as they would operate below the City's LOS standard of LOS D:
    - I-15 NB Ramps/Nichols Road (LOS F during both peak hours)
    - Collier Avenue/Nichols Road (LOS E during the AM peak hour and LOS F during the PM peak hour)Collier Avenue (SR-74)/Central Avenue (SR-74) (LOS E during both peak hours)
    - I-15 SB Ramps/Central Avenue (SR-74) (LOS F during the PM peak hour)
    - Dexter Avenue/Central Avenue (SR-74) (LOS E during the AM peak hour)
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) (LOS F during both peak hours)

- The following mitigation measures are proposed to improve the LOS at the impacted intersections. These mitigation measures are proposed for the Existing plus Project scenario:
    - Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:
        - I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
            - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
        - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) – The peak hour volumes at this intersection would not satisfy the peak

hour signal warrant. The following improvement is needed to mitigate intersection LOS:

- Convert this intersection into a signalized intersection. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.

- Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:
  - Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:

    Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during the PM peak hour.

- The following mitigation measures are proposed to improve the LOS at the impacted intersections. These mitigation measures are proposed for the Existing plus Ambient Growth plus Project scenario:
  - Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:
    - Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
      - Convert this intersection into a signalized intersection. With this mitigation, the intersection is forecast to operate at LOS A during the AM peak hour.
  - Prior to issuance of Certificate of Occupancy, the proposed project shall construct the following improvements:
    - I-15 NB Ramps/Nichols Road – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
      - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS B during the PM peak hour.
    - Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
      - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS C during the PM peak hour.

- The following mitigation measures are proposed to improve the LOS at the impacted intersections. These mitigation measures are proposed for the Existing plus Ambient Growth plus Project plus Cumulative Projects scenario:
  - Prior to issuance of Certificate of Occupancy, the proposed project shall pay its fair-share to construct the following improvements:

- I-15 NB Ramps/Nichols Road – – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the AM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement is needed to mitigate intersection LOS:
  - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS B during both the AM and PM.
- Collier Avenue/Nichols Road – Although the peak hour volumes at this intersection would satisfy the peak hour signal warrant for the PM peak hour, a signal is not needed to improve LOS back to LOS D or better. The following improvement would mitigate intersection LOS without the installation of a traffic signal:
  - Convert this intersection into an all-way-stop. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour and LOS C during the PM peak hour.
- Collier Avenue (SR-74)/Riverside Drive (SR-74) – The following improvement is needed to mitigate intersection LOS:
  - Restripe two southbound through lanes to one southbound through and one southbound through-left lane. With this mitigation, the intersection is forecast to operate at LOS D during both the AM and PM peak hour.
- I-15 SB Ramps/Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
  - Install a third eastbound through lane and install a second (dual) southbound left turn lane. With this mitigation, the intersection is forecast to operate at LOS C during the AM peak hour.
- Dexter Avenue /Central Avenue (SR-74) – The following improvement is needed to mitigate intersection LOS:
  - Change northbound left turn phasing to protected-permitted. With this mitigation, the intersection is forecast to operate at LOS D during the AM peak hour.
- Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74) – The peak hour volumes at this intersection would not satisfy the peak hour signal warrant. The following improvement is needed to mitigate intersection LOS:
  - Convert this intersection into a signalized intersection. With this mitigation, the intersection is forecast to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

- The project's fair share percentages range from 0.9 percent through 12.5 percent for the intersection improvements discussed above.

- All roadway segments operate at LOS D or better and would operate within the City's standard of LOS D, except for Riverside Drive (SR-74), west of Collier Avenue. This segment is currently operating at LOS E-F under existing conditions, and is forecast to continue to operate at LOS E-F under Existing plus Ambient Growth plus Project conditions, as well as with the addition of traffic from cumulative projects (Existing plus Ambient Growth plus Project plus Cumulative Projects). Collier Avenue, south of Riverside Drive (SR-74) in the Existing plus Ambient Growth plus Project plus

Cumulative Projects condition is forecast to degrade to LOS F with the addition of Cumulative Project traffic.

The project will restripe the southbound approach at Collier Avenue/Riverside Drive (SR-74) to consist of one right lane and one shared-left lane in order to construct an additional northbound left-turn lane for the Collier Avenue driveway.

The Project will provide two driveways, along Riverside Drive (SR-74) and Collier Avenue. As per discussion with Caltrans, the Riverside Drive driveway will be restricted to right in right out movements. The Collier Avenue driveway, as per approval from the City, will be constructed as a full access driveway with two approaching southbound lanes, and one northbound left turn lane providing access to the site. For both driveways there will be one lane for entering and one lane for exiting, with a width of 50 feet, providing ample space for larger vehicles to enter the site without restricting vehicles exiting. See Figure 2 for more information.

Currently, Riverside Drive (SR-74), along the project's frontage, is also not constructed to its ultimate Urban Arterial width of 96 feet, curb-to-curb. It is currently unimproved (i.e., no curb-and-gutter), and has approximately 48 to 52 feet of pavement. Based on review of the project site plan, the proposed project will dedicate between 21 feet and 36 feet (street tapers in toward the west) in order to allow their half-section of Riverside Drive to be consistent with the Urban Arterial (half) cross section (center median, three travel lanes, six foot bike lane, and 6 foot sidewalk – in one direction). The project will follow Caltrans standards to improve its section of Riverside Drive. Street improvements on the north side of Riverside Drive (SR-74), along the project's frontage, will conform with Caltrans roadway design standards.
The roadway segment of Riverside Drive, west of Collier Avenue is part of the TUMF network and is to be improved to its ultimate width using those funds. However, with the project improvements listed above, and the addition of project traffic (approximately 540 ADT), this segment of Riverside Drive (SR-74) is forecast to continue to operate at LOS E-F under both conditions. The project's fair share percentage for the roadway segment of Riverside Drive (SR-74), west of Collier Avenue would be 5.2 percent. Collier Avenue, south of Riverside Drive (SR-74), with the addition of project traffic (approximately 1,056 ADT), this segment of Collier Avenue (SR-74) is forecast to continue to operate LOS E-F under Existing plus Ambient Growth plus Project conditions. The project's fair share percentage for the roadway segment of Collier Avenue, south of Riverside Drive (SR-74) would be 9.6 percent.

Appendix A: Scoping Agreement

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the Riverside County Transportation Department requirements for traffic impact analysis of the following project. The analysis must follow the Riverside County Transportation Department Traffic Study Guidelines dated February 2005.

Case No. (i.e. TR, PM, CUP, PP) 2016-112 Kassab Travel C
Related Cases -
SP No. *Provide SP No. and list of other approved or active projects within the SP.*
EIR No.
GPA No.
CZ No.
Project Name: Kassab Travel Center
Project Address: 29301 Riverside Drive (southwest corner of Collier Avenue/Riverside Drive), Lake Elsinore, CA
Project Description: 18 pump gas station with 6,000 SF convenience store containing three quick serve restaurants; and, 2,543 SF fast food restaurant with drive-through

	Consultant	Developer
Name:	Transpo Group	Ken Kassab
Address:	603 N. Park Center Drive, Suite 108	c/o Environmental Advisors
	Santa Ana, CA 92705	Josh Haskins
Telephone:	949-656-7908	2400 E. Katella Avenue, Suite 800
Fax:		Anaheim, CA 92806

A. Trip Generation Source: ITE Trip Generation, 9th Edition (2012)

Current GP Land Use *Provide General Plan Land Use Designation (e.g.: MDR, C* Limited Industrial
Proposed Land Use Commercial
Current Zoning Commercial Manufacturing
Proposed Zoning Commercial Manufacturing

Current Trip Generation	In	Out	Total	Proposed Trip Generation In	Out	Total
AM Trips	None	None	None	65	64	129
PM Trips	None	None	None	75	73	148

Internal Trip Allowance ☐ Yes ☑ No (____ % Trip Discount)
Pass-By Trip Allowance ☑ Yes ☐ No (See Table 1 - Trip Generation % Trip Discount)

A passby trip discount of 25% is allowed for appropriate land uses. The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: (attach exhibit for detailed assignment) N % S % E % W %
Please see attached exhibits

C. Background Traffic

Project Build-out Year: *Provide realistic opening year, considering time needed for approvals and construction.* *2019*
Annual Ambient Growth Rate: ____ % To be provided by County Staff
Phase Year(s) ____
Other area projects to be analyzed: To be provided by City staff

Model/Forecast methodology Existing traffic plus growth rate plus traffic from other area projects (cumulative projects)

D. Study intersections: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. I-15 NB ramps/Nichols Road
2. I-15 SB ramps/Nichols Road
3. Collier Avenue/Nichols Road
4. Collier Avenue (SR-74)/Riverside Drive (SR-74)
5. Collier Avenue (SR-74)/Hunco Way
6. Collier Avenue (SR-74)/Central Avenue (SR-74)
7. I-15 SB ramps/Central Avenue (SR-74)
8. I-15 NB ramps/Central Avenue (SR-74)
9. Dexter Avenue/Central Avenue (SR-74)
10. Gunnerson Street-Strickland Avenue/Riverside Drive (SR-74)

E. Study Roadway Segments: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. Riverside Drive (SR-74), west of Collier Avenue
2. Collier Avenue, north of Riverside Drive (SR-74)
3. Collier Avenue, south of Riverside Drive (SR-74)
4.
5.
6.
7.
8.
9.
10.

E. Other Jurisdictional Impacts

Is this project within a City's Sphere of Influence or one-mile radius of City boundaries? ■ Yes ☐ No

If so, name of City Jurisdiction: City of Lake Elsinore; Riverside County

F. Site Plan (please attach reduced copy)

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Transportation Department)
(NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing unsignalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.
Date of counts Intersection traffic count data from October 2016 and May 2017 (while all adjacent schools were in session). One historical count adjusted via surrounding volumes.

***NOTE* Traffic Study Submittal Form and appropriate fee must be submitted with, or prior to submittal of this form. Transportation Department staff will not process the Scoping Agreement prior to receipt of the fee.**

Recommended by:

Dennis Pascua — 7/12/2017
Consultant's Representative — Date

Approved Scoping Agreement:

Riverside County Transportation Department — Date

Scoping Agreement Submitted on _____

Revised on _____

Table 1. Project Trip Generation

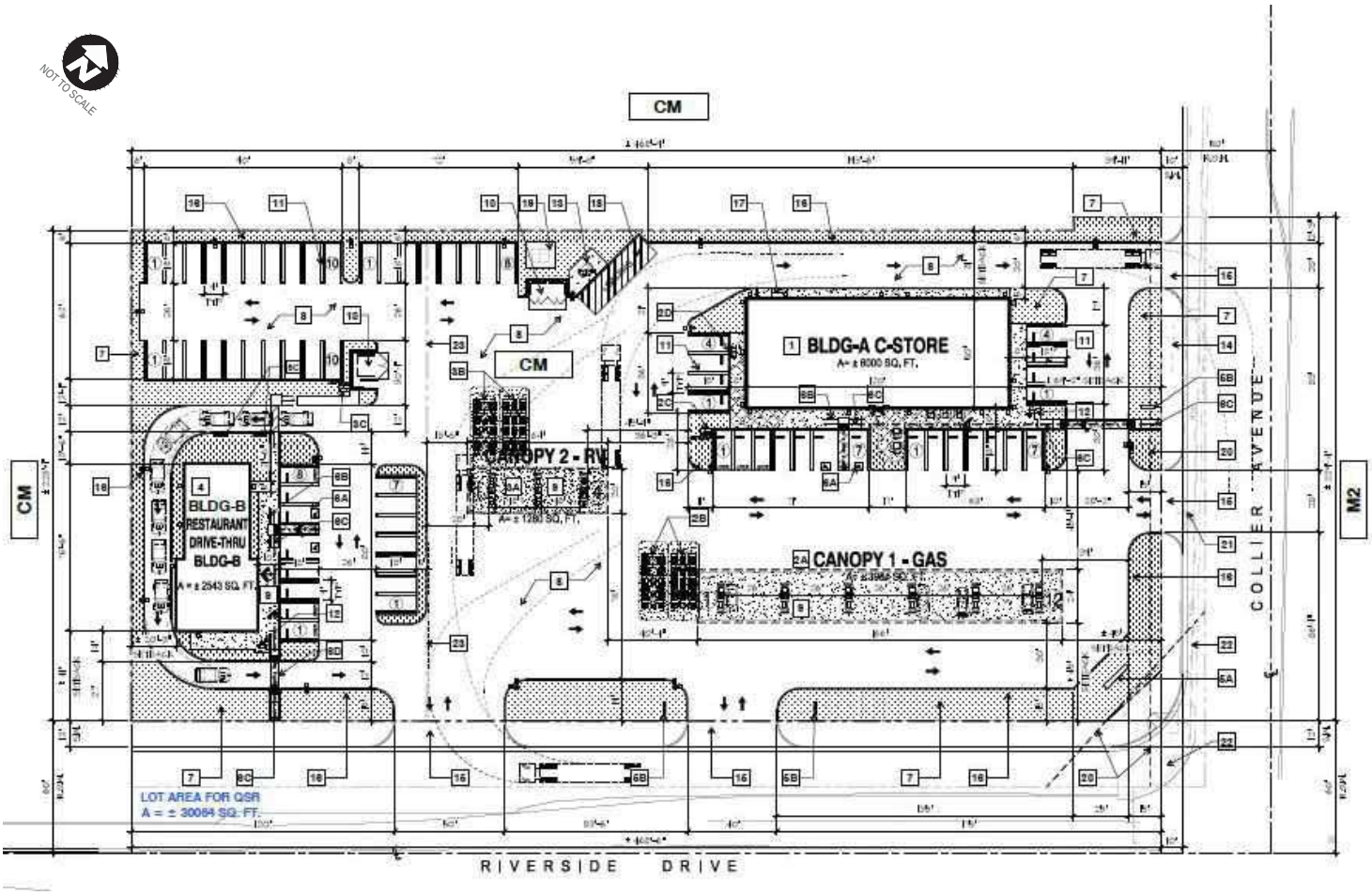
Land Use		Units	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Trip Rates									
Fast-Food Restaurant with Drive-Through Window [1]		TSF	496.12	23.16	22.26	45.42	16.98	15.67	32.65
Gasoline/Service Station with Convenience Market [2]		VFP	162.78	5.08	5.08	10.16	6.76	6.76	13.51
Project Trip Generation									
Fast-Food Restaurant with Drive-Through Window	2.54	TSF	1,260	59	57	115	43	40	83
Passby (49% AM/Daily, 50% PM) [3]			-630	-29	-28	-57	-22	-20	-41
NET			630	30	29	59	22	20	41
Gas Station & Convenience Market	18	VFP	2,930	91	91	183	122	122	243
Passby (62% AM/Daily, 56% PM) [3]			-1,641	-57	-57	-113	-68	-68	-136
NET			1,289	35	35	69	53	53	107
Total Trip Generation			4,190	150	148	298	165	161	326
NET Trip Generation			1,919	65	64	129	75	73	148

TSF = Thousand Square Feet, VFP = Vehicle Fueling Positions

[1] Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 934 - Fast-Food Restaurant with Drive-Through Window.

[2] Trip rates from the Institute of Transporation Engineers, *Trip Generation, 9th Edition,* 2012. Land Use Code 945 - Gasoline/Service Station with Convenience Market

[3] Pass-by percentages based on rates/equations obtained from the Trip Generation Handbook, 2nd Edition, ITE, 2004.



Project Site Plan

FIGURE 1

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Table 1. Project Trip Generation

Land Use		Units	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Trip Rates									
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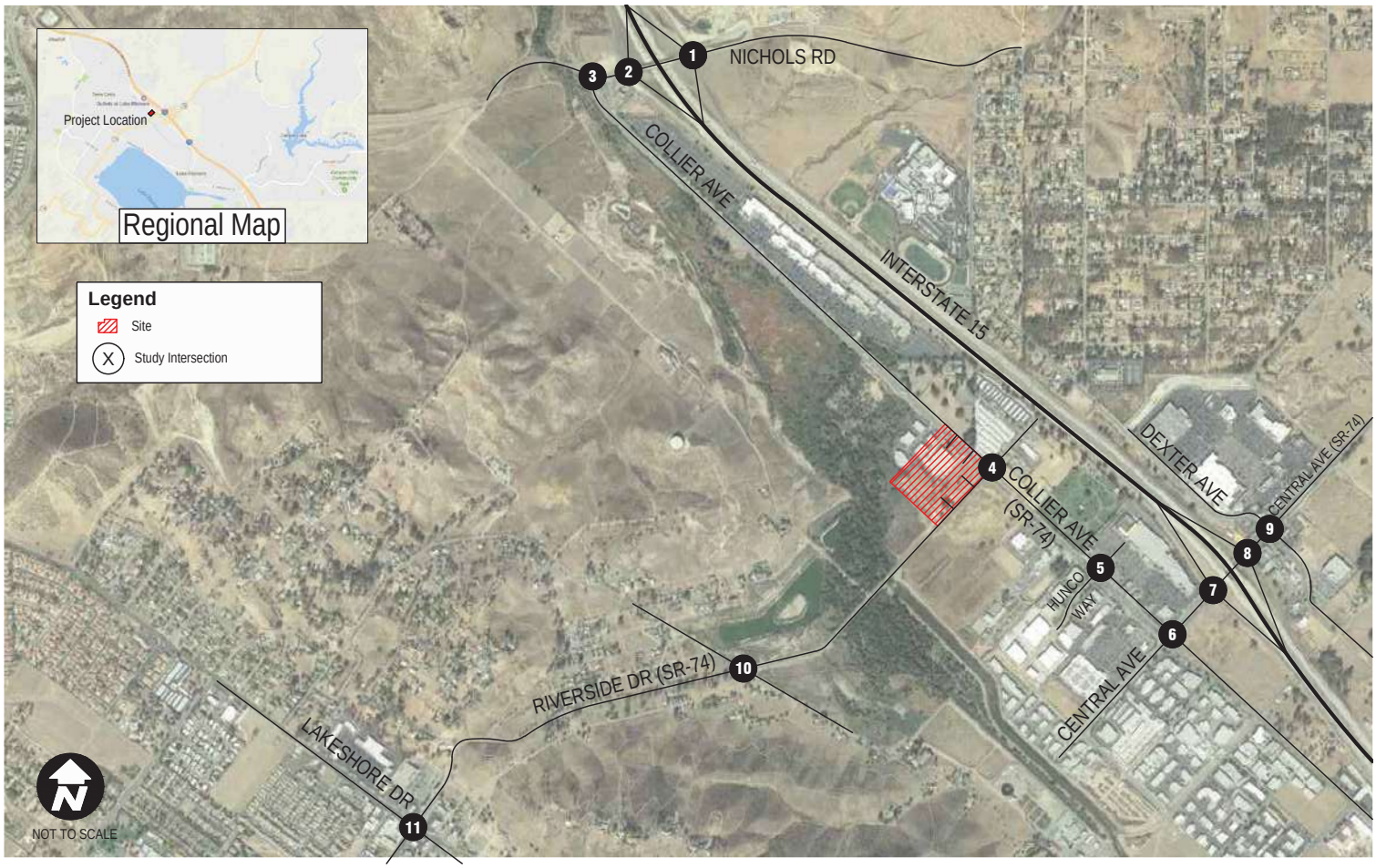


Source: Google Maps, 10/2016

Project Site Location and Study Area

FIGURE **2**

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Jun 09, 2017 - 2:21pm mladenp C:\Users\mladenp\Dropbox (Transpo CA)\Transpo CA Team Folder\Projects\2017\17143.PR - Kassab Travel Center Lake Elsinore\Graphics\Base_KassabTravelCenter.dwg Layout: Fig2-StudyArea

Source: Google Maps, 10/2016

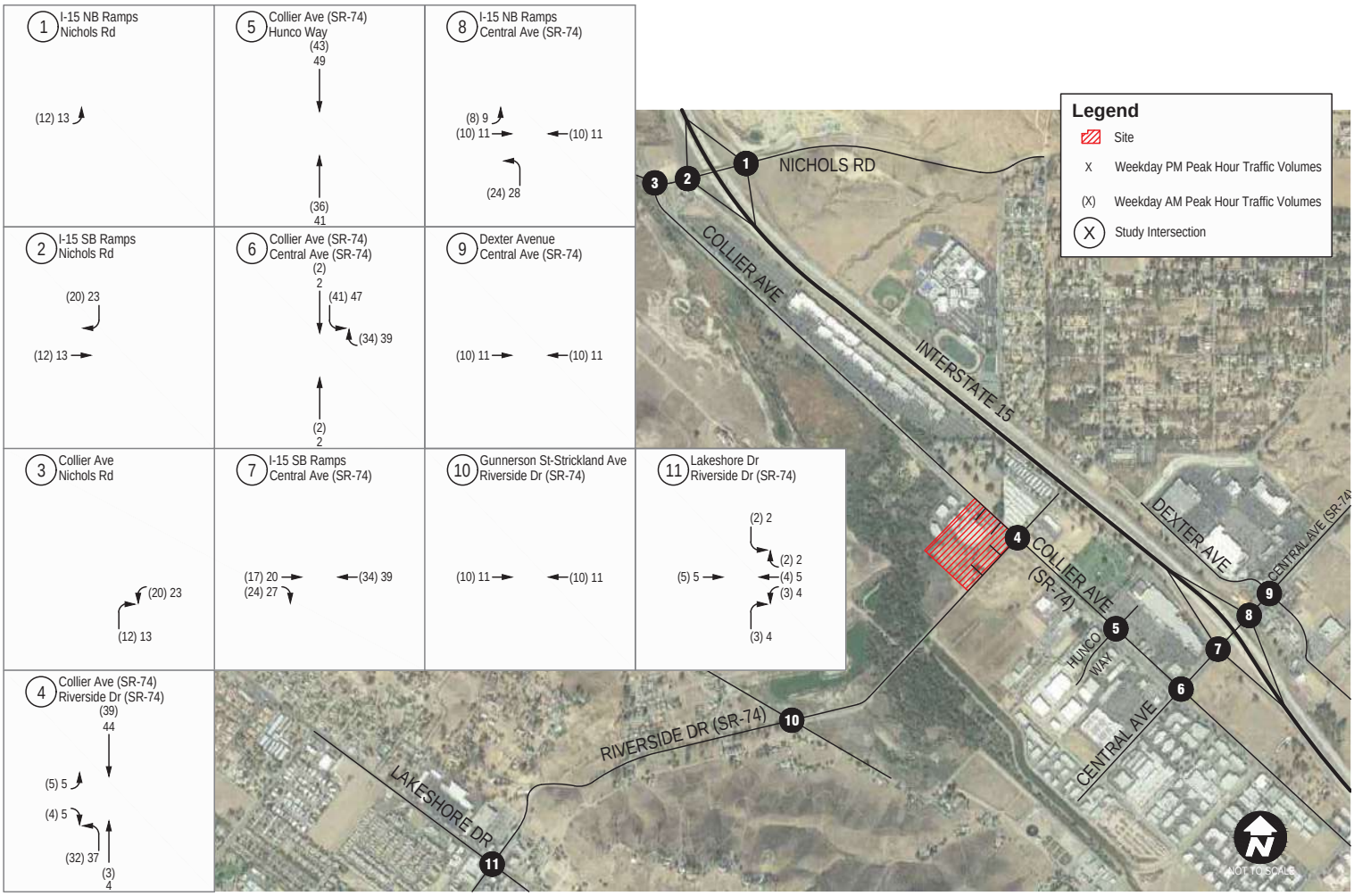
Project Trip Distribution

FIGURE 3

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Jun 09, 2017 - 2:22pm mladenp C:\Users\mladenp\Dropbox (Transpo CA)\Transpo CA Team Folder\Projects\2017\17143.PR - Kassab Travel Center Lake Elsinore\Graphics\Base_KassabTravelCenter.dwg Layout: Fig3-ProjDist



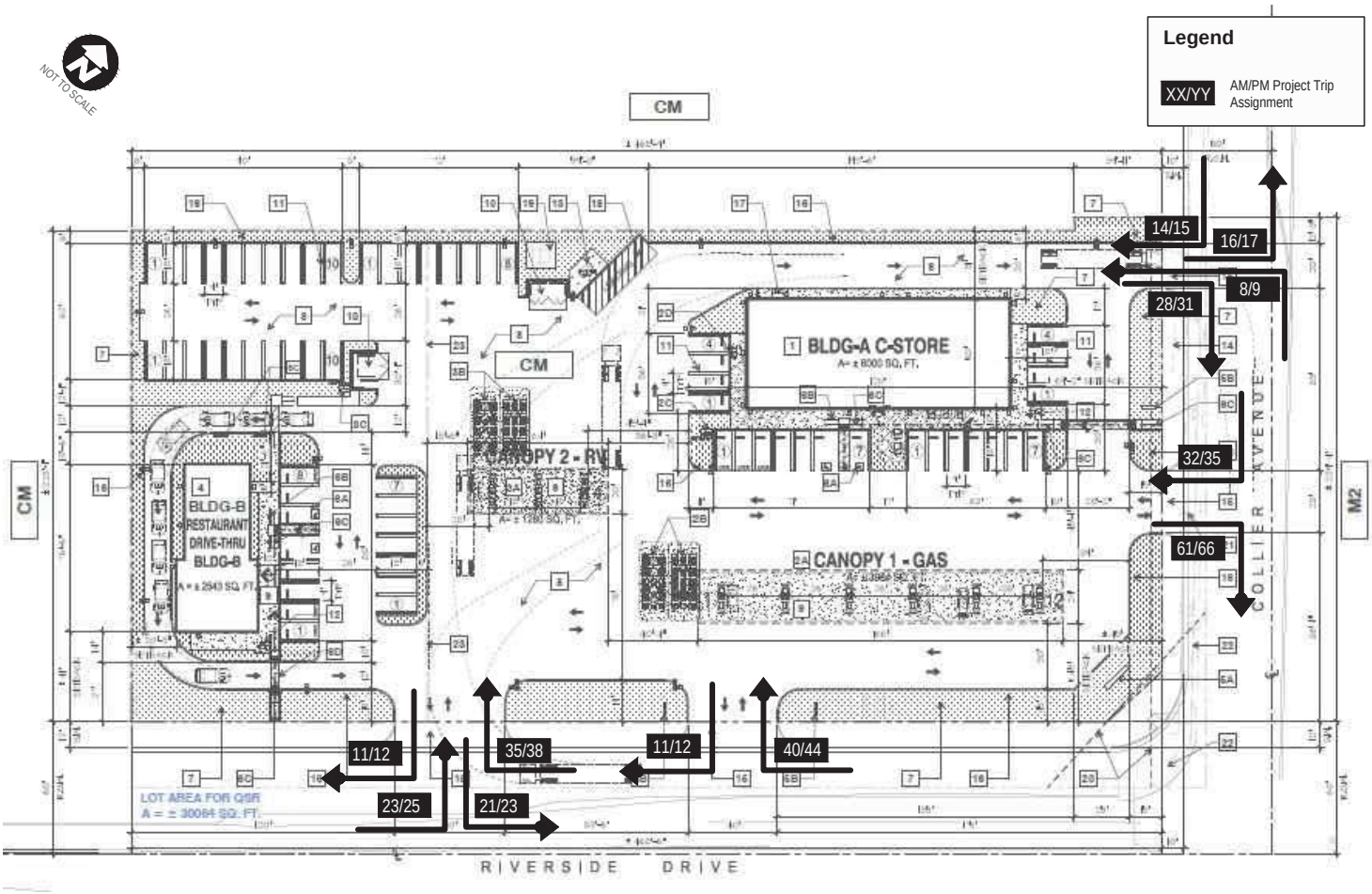
Source: Google Maps, 10/2016

Project Net Total Trip Assignment

FIGURE 4

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.



Project Driveway Trip Assignment

FIGURE **5**

Kassab Travel Center TIA

transpogroup
WHAT TRANSPORTATION CAN BE.

Jun 08, 2017 - 5:34pm mladenp C:\Users\mladenp\Dropbox (Transpo CA)\Transpo CA Team Folder\Projects\2017\17143.PR - Kassab Travel Center Lake Elsinore\Graphics\Base_KassabTravelCenter.dwg Layout: Fig5-ProjPassbyDwy

Appendix B: Traffic Counts

INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: I-15 NB Ramp
EAST & WEST: Nichols

PROJECT #: SC1114
LOCATION #: 3
CONTROL: STOP N

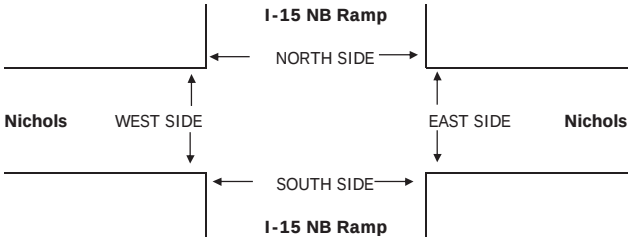
NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

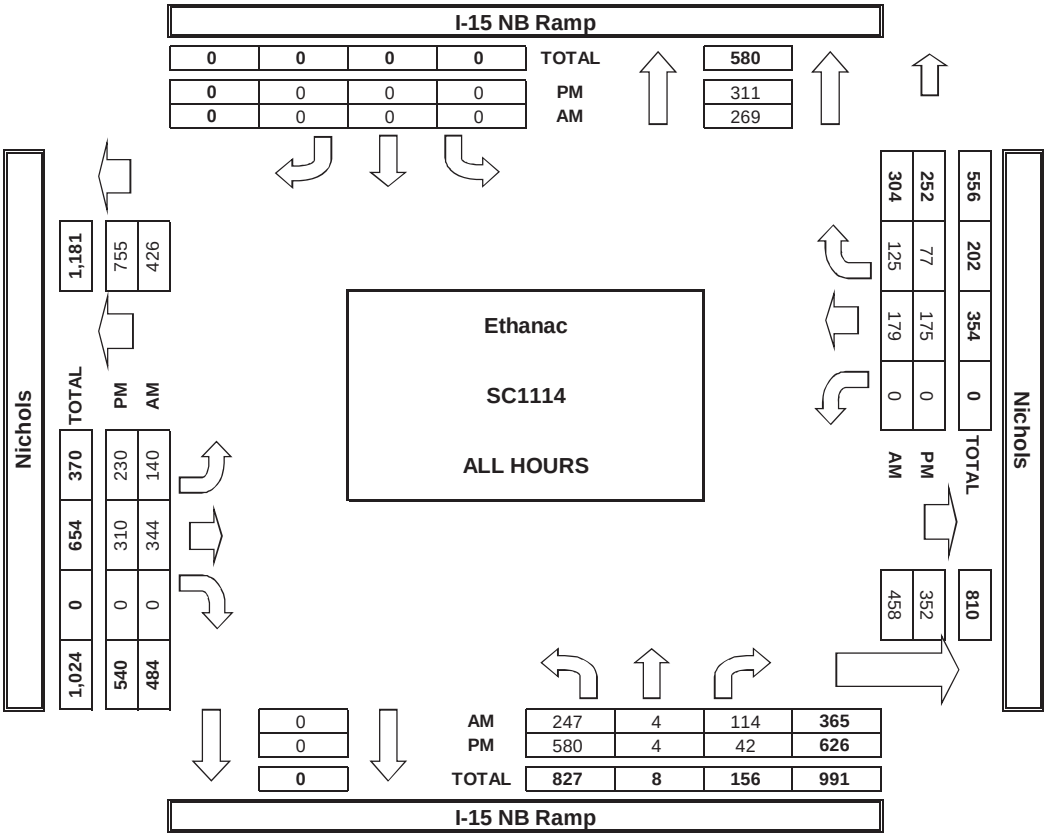
		NORTHBOUND I-15 NB Ramp			SOUTHBOUND I-15 NB Ramp			EASTBOUND Nichols			WESTBOUND Nichols				U-TURNS				
	LANES:	NL 0	NT 1	NR 0	SL X	ST X	SR X	EL 1	ET 1	ER X	WL X	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	40	0	58	0	0	0	17	154	0	0	35	36	340	0	0	0	0	0
	7:15 AM	51	0	29	0	0	0	15	93	0	0	62	30	280	0	0	0	0	0
	7:30 AM	37	1	3	0	0	0	20	29	0	0	37	27	154	0	0	0	0	0
	7:45 AM	26	0	2	0	0	0	20	17	0	0	11	4	80	0	0	0	0	0
	8:00 AM	26	0	6	0	0	0	14	21	0	0	9	7	83	0	0	0	0	0
	8:15 AM	25	1	6	0	0	0	12	17	0	0	11	9	81	0	0	0	0	0
	8:30 AM	16	1	5	0	0	0	29	3	0	0	7	5	66	0	0	0	0	0
	8:45 AM	26	1	5	0	0	0	13	10	0	0	7	7	69	0	0	0	0	0
	VOLUMES	247	4	114	0	0	0	140	344	0	0	179	125	1,153	0	0	0	0	0
	APPROACH %	68%	1%	31%	0%	0%	0%	29%	71%	0%	0%	59%	41%						
	APP/DEPART	365	/	269	0	/	0	484	/	458	304	/	426	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	154	1	92	0	0	0	72	293	0	0	145	97	854					
	APPROACH %	62%	0%	37%	0%	0%	0%	20%	80%	0%	0%	60%	40%						
	PEAK HR FACTOR		0.630			0.000			0.534			0.658		0.628					
	APP/DEPART	247	/	170	0	/	0	365	/	385	242	/	299	0					
PM	4:00 PM	71	0	4	0	0	0	29	49	0	0	16	10	179	0	0	0	0	0
	4:15 PM	53	1	6	0	0	0	35	42	0	0	17	5	159	0	0	0	0	0
	4:30 PM	62	0	9	0	0	0	39	30	0	0	25	13	178	0	0	0	0	0
	4:45 PM	73	0	9	0	0	0	31	40	0	0	26	7	186	0	0	0	0	0
	5:00 PM	71	2	3	0	0	0	23	49	0	0	22	15	185	0	0	0	0	0
	5:15 PM	71	0	3	0	0	0	31	35	0	0	24	11	175	0	0	0	0	0
	5:30 PM	81	1	5	0	0	0	23	25	0	0	26	10	171	0	0	0	0	0
	5:45 PM	98	0	3	0	0	0	19	40	0	0	19	6	185	0	0	0	0	0
	VOLUMES	580	4	42	0	0	0	230	310	0	0	175	77	1,418	0	0	0	0	0
	APPROACH %	93%	1%	7%	0%	0%	0%	43%	57%	0%	0%	69%	31%						
	APP/DEPART	626	/	311	0	/	0	540	/	352	252	/	755	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	277	2	24	0	0	0	124	154	0	0	97	46	724					
	APPROACH %	91%	1%	8%	0%	0%	0%	45%	55%	0%	0%	68%	32%						
	PEAK HR FACTOR		0.924			0.000			0.965			0.941		0.973					
	APP/DEPART	303	/	172	0	/	0	278	/	178	143	/	374	0					

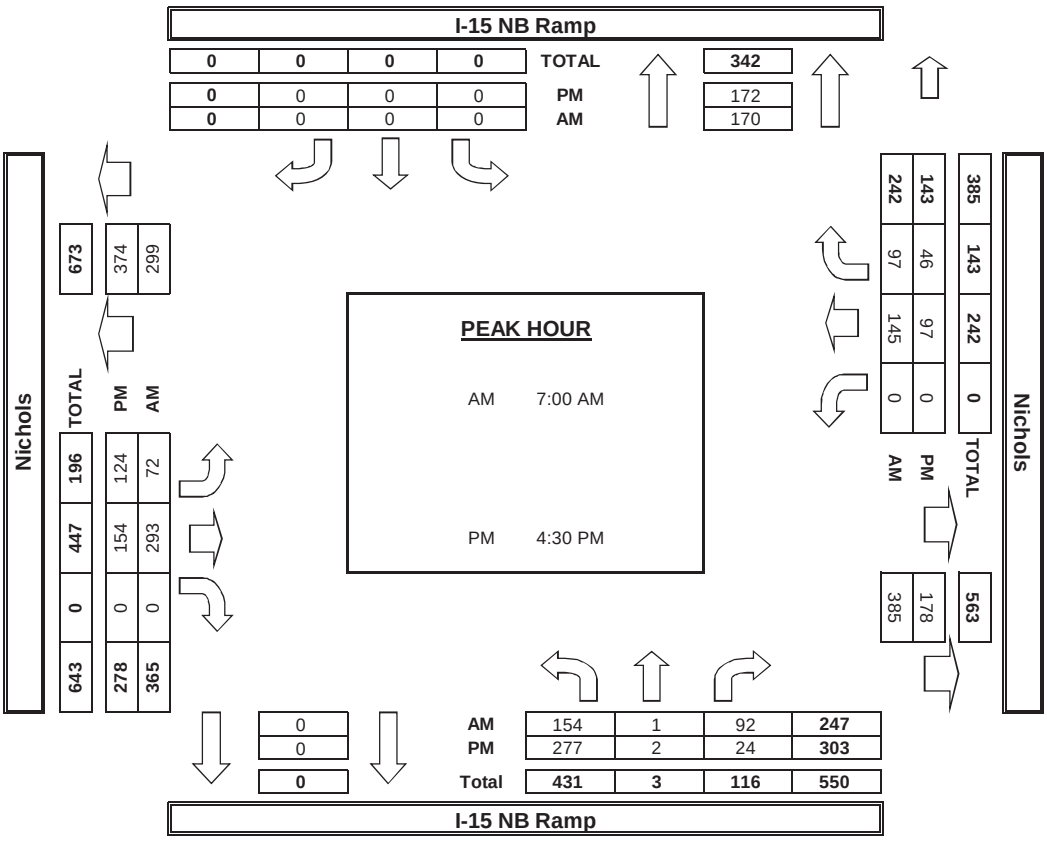


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: I-15 SB Ramp
EAST & WEST: Nichols

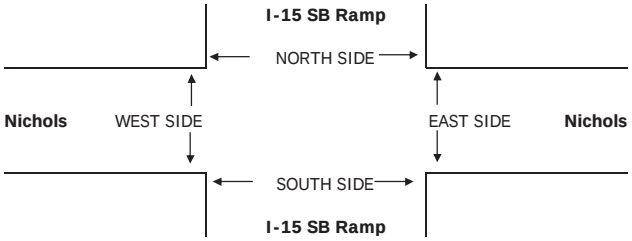
PROJECT #: SC1114
LOCATION #: 2
CONTROL: STOP ALL

NOTES:

AM PM MD OTHER OTHER — ▲ N ◄ W E ► S ▼

☐ Add U-Turns to Left Turns

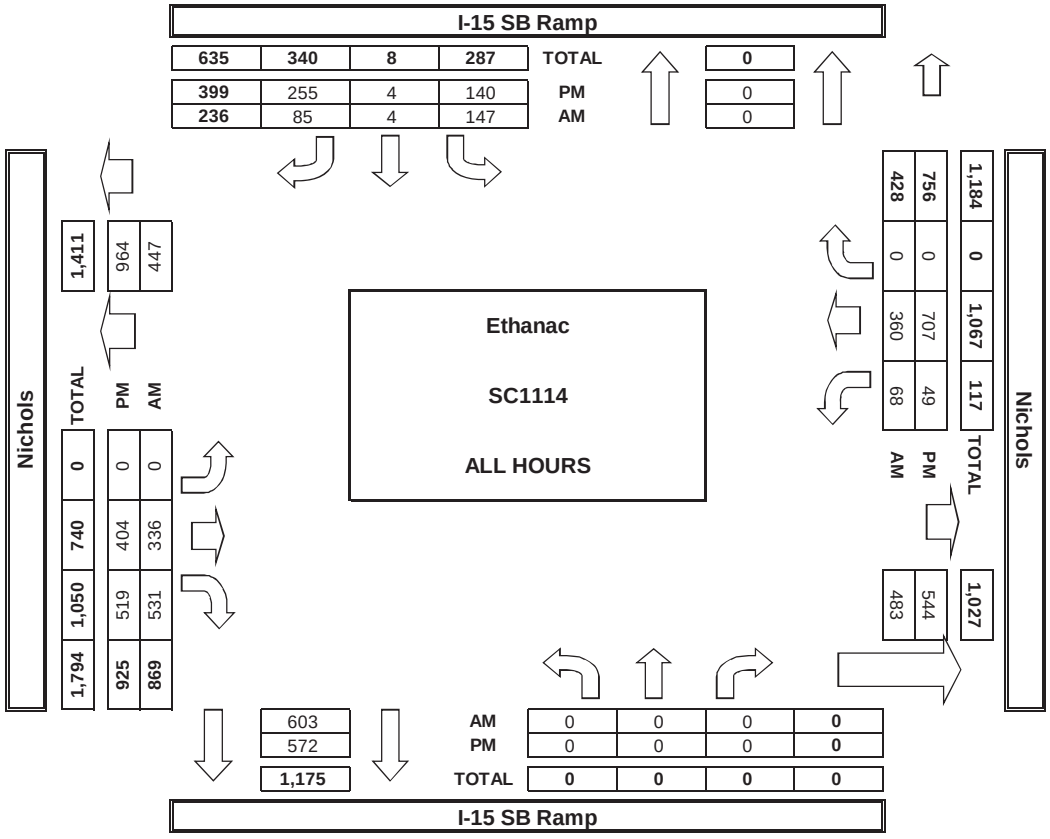
		NORTHBOUND I-15 SB Ramp			SOUTHBOUND I-15 SB Ramp			EASTBOUND Nichols			WESTBOUND Nichols				U-TURNS				
	LANES:	NL X	NT X	NR X	SL 0	ST 1	SR 0	EL X	ET 1	ER 1	WL 1	WT 1	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	67	1	16	0	103	51	12	62	0	312	0	0	0	0	0
	7:15 AM	0	0	0	42	1	13	0	66	74	15	98	0	309	0	0	0	0	0
	7:30 AM	0	0	0	12	1	10	0	37	95	8	68	0	231	0	0	0	0	0
	7:45 AM	0	0	0	8	1	20	0	31	71	10	26	0	167	0	0	0	0	0
	8:00 AM	0	0	0	12	0	19	0	22	82	6	29	0	170	0	0	0	0	0
	8:15 AM	0	0	0	6	0	7	0	22	64	6	32	0	137	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	32	53	3	20	0	108	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	23	41	8	25	0	97	0	0	2	0	2
	VOLUMES	0	0	0	147	4	85	0	336	531	68	360	0	1,533	0	0	2	0	2
	APPROACH %	0%	0%	0%	62%	2%	36%	0%	39%	61%	16%	84%	0%						
	APP/DEPART	0	/	0	236	/	603	869	/	483	428	/	447	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	0	0	0	129	4	59	0	237	291	45	254	0	1,019					
	APPROACH %	0%	0%	0%	67%	2%	31%	0%	45%	55%	15%	85%	0%						
	PEAK HR FACTOR		0.000			0.571			0.857			0.662		0.817					
	APP/DEPART	0	/	0	192	/	340	528	/	366	299	/	313	0					
PM	4:00 PM	0	0	0	18	2	32	0	61	67	6	82	0	268	0	0	0	0	0
	4:15 PM	0	0	0	17	0	39	0	58	70	8	67	0	259	0	0	1	0	1
	4:30 PM	0	0	0	20	0	39	0	53	70	7	80	0	269	0	0	0	0	0
	4:45 PM	0	0	0	18	1	35	0	54	59	4	96	0	267	0	0	1	0	1
	5:00 PM	0	0	0	21	0	26	0	51	71	7	83	0	259	0	0	0	0	0
	5:15 PM	0	0	0	8	0	35	0	56	75	3	94	0	271	0	0	0	0	0
	5:30 PM	0	0	0	13	0	24	0	36	47	8	97	0	225	0	0	0	0	0
	5:45 PM	0	0	0	25	1	25	0	35	60	6	108	0	260	0	0	0	0	0
	VOLUMES	0	0	0	140	4	255	0	404	519	49	707	0	2,080	0	0	2	0	2
	APPROACH %	0%	0%	0%	35%	1%	64%	0%	44%	56%	6%	94%	0%						
	APP/DEPART	0	/	0	399	/	572	925	/	544	756	/	964	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	0	0	0	67	1	135	0	214	275	21	353	0	1,067					
	APPROACH %	0%	0%	0%	33%	0%	67%	0%	44%	56%	6%	94%	0%						
	PEAK HR FACTOR		0.000			0.860			0.935			0.935		0.984					
	APP/DEPART	0	/	0	203	/	297	490	/	281	374	/	489	0					

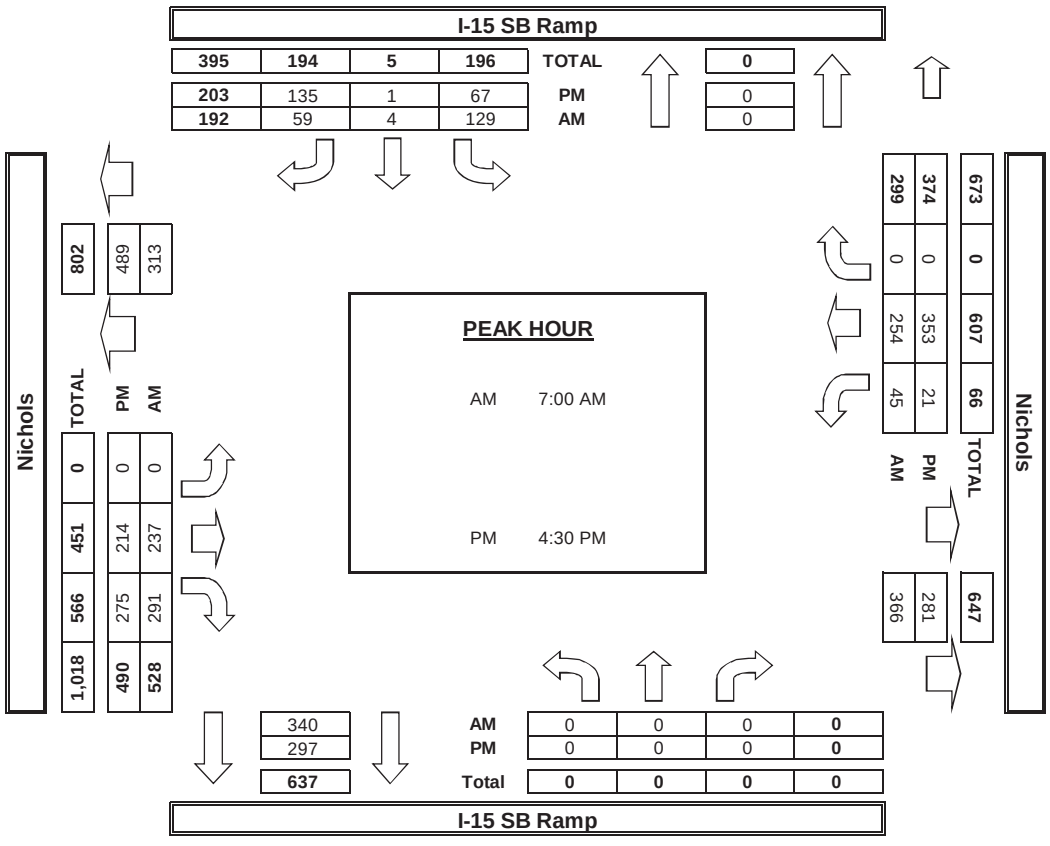


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	2	0	0	0	2	0	0	0	0	0	2	0	0	0	2
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

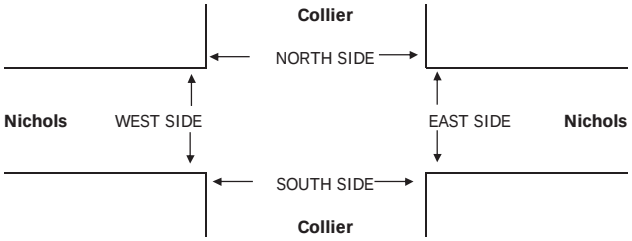
DATE:	LOCATION:	Ethanac	PROJECT #:	SC1114
Thu, Oct 27, 16	NORTH & SOUTH:	Collier	LOCATION #:	1
	EAST & WEST:	Nichols	CONTROL:	STOP N

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

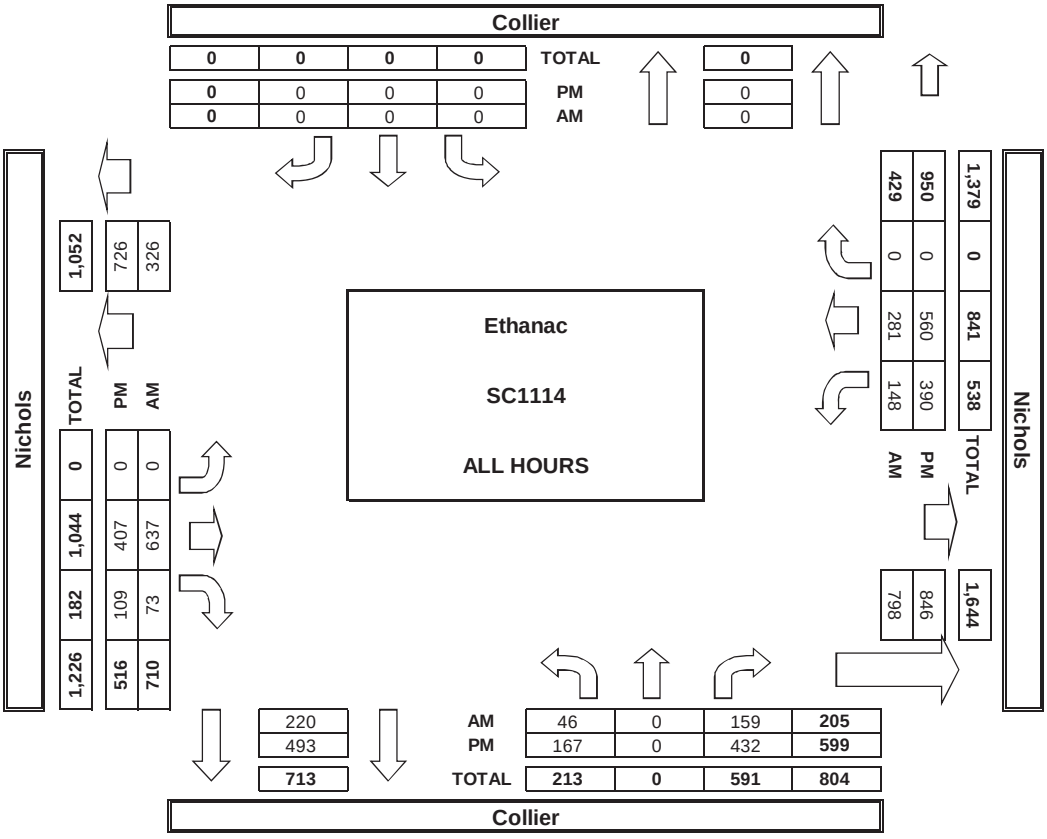
		NORTHBOUND (Collier)			SOUTHBOUND (Collier)			EASTBOUND (Nichols)			WESTBOUND (Nichols)				U-TURNS				
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 1	WT 1	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	5	0	28	0	0	0	0	126	3	31	50	0	243	0	0	0	0	0
	7:15 AM	9	0	28	0	0	0	0	88	7	23	80	0	235	0	0	0	1	1
	7:30 AM	4	0	16	0	0	0	0	111	15	24	51	0	221	0	0	0	0	0
	7:45 AM	4	0	20	0	0	0	0	74	7	22	22	0	149	0	0	0	0	0
	8:00 AM	6	0	18	0	0	0	0	74	9	24	23	0	154	0	0	0	1	1
	8:15 AM	7	0	9	0	0	0	0	68	17	11	23	0	135	1	0	0	0	1
	8:30 AM	8	0	22	0	0	0	0	54	8	5	15	0	112	0	0	0	0	0
	8:45 AM	3	0	18	0	0	0	0	42	7	8	17	0	95	0	0	0	0	0
	VOLUMES	46	0	159	0	0	0	0	637	73	148	281	0	1,344	1	0	0	2	3
	APPROACH %	22%	0%	78%	0%	0%	0%	0%	90%	10%	34%	66%	0%						
	APP/DEPART	205	/	0	0	/	220	710	/	798	429	/	326	0					
	BEGIN PEAK HR	7:00 AM																	
	VOLUMES	22	0	92	0	0	0	0	399	32	100	203	0	848					
	APPROACH %	19%	0%	81%	0%	0%	0%	0%	93%	7%	33%	67%	0%						
	PEAK HR FACTOR		0.770			0.000			0.835			0.735		0.872					
	APP/DEPART	114	/	0	0	/	131	431	/	492	303	/	225	0					
PM	4:00 PM	17	0	52	0	0	0	0	63	11	52	59	0	254	1	0	0	3	4
	4:15 PM	21	0	71	0	0	0	0	47	16	57	49	0	261	0	0	0	2	2
	4:30 PM	19	0	64	0	0	0	0	48	14	53	64	0	262	0	0	0	0	0
	4:45 PM	21	0	44	0	0	0	0	53	16	58	72	0	264	0	0	0	0	0
	5:00 PM	22	0	48	0	0	0	0	58	6	43	66	0	243	0	0	0	0	0
	5:15 PM	20	0	69	0	0	0	0	52	21	47	79	0	288	0	0	0	2	2
	5:30 PM	21	0	49	0	0	0	0	28	14	39	81	0	232	0	0	0	0	0
	5:45 PM	26	0	35	0	0	0	0	58	11	41	90	0	261	0	0	0	0	0
	VOLUMES	167	0	432	0	0	0	0	407	109	390	560	0	2,065	1	0	0	7	8
	APPROACH %	28%	0%	72%	0%	0%	0%	0%	79%	21%	41%	59%	0%						
	APP/DEPART	599	/	0	0	/	493	516	/	846	950	/	726	0					
	BEGIN PEAK HR	4:30 PM																	
	VOLUMES	82	0	225	0	0	0	0	211	57	201	281	0	1,057					
	APPROACH %	27%	0%	73%	0%	0%	0%	0%	79%	21%	42%	58%	0%						
	PEAK HR FACTOR		0.862			0.000			0.918			0.927		0.918					
	APP/DEPART	307	/	0	0	/	256	268	/	438	482	/	363	0					

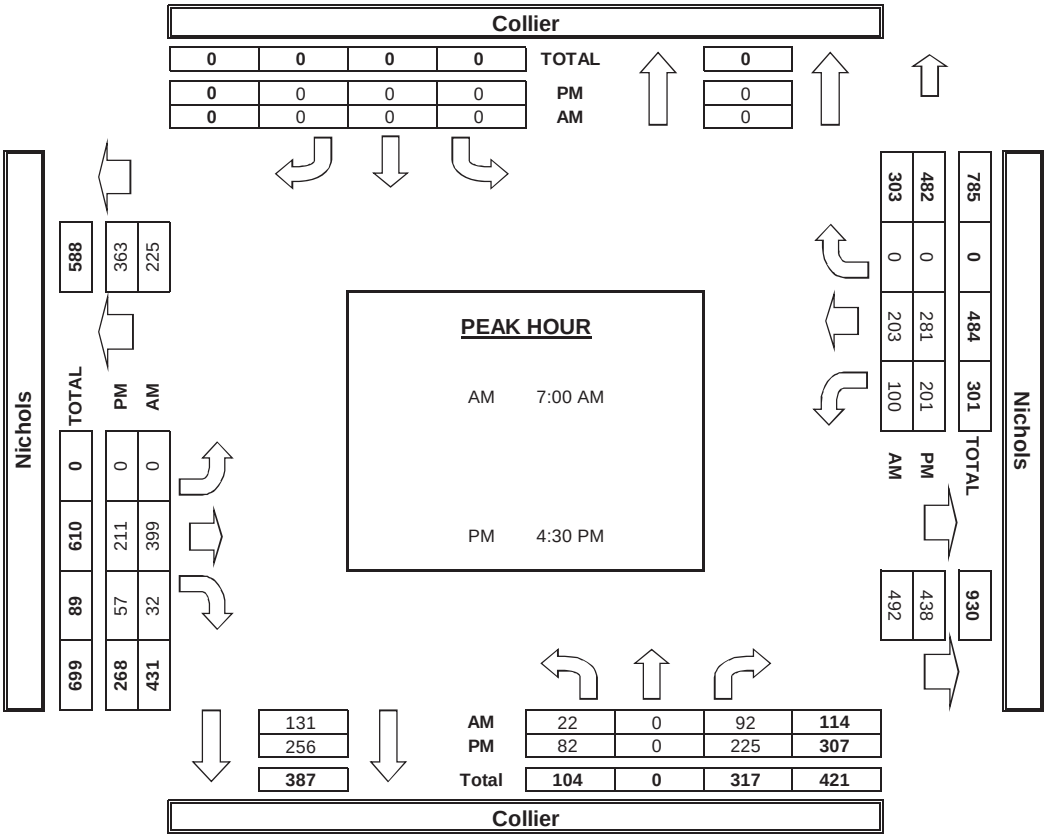


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: Collier
EAST & WEST: SR-74

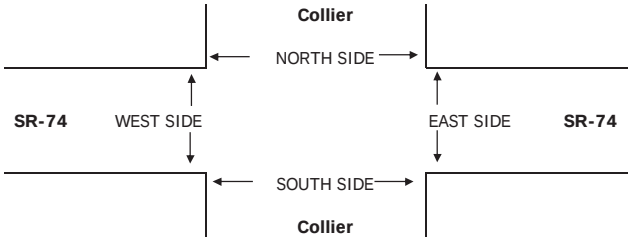
PROJECT #: SC1114
LOCATION #: 14
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

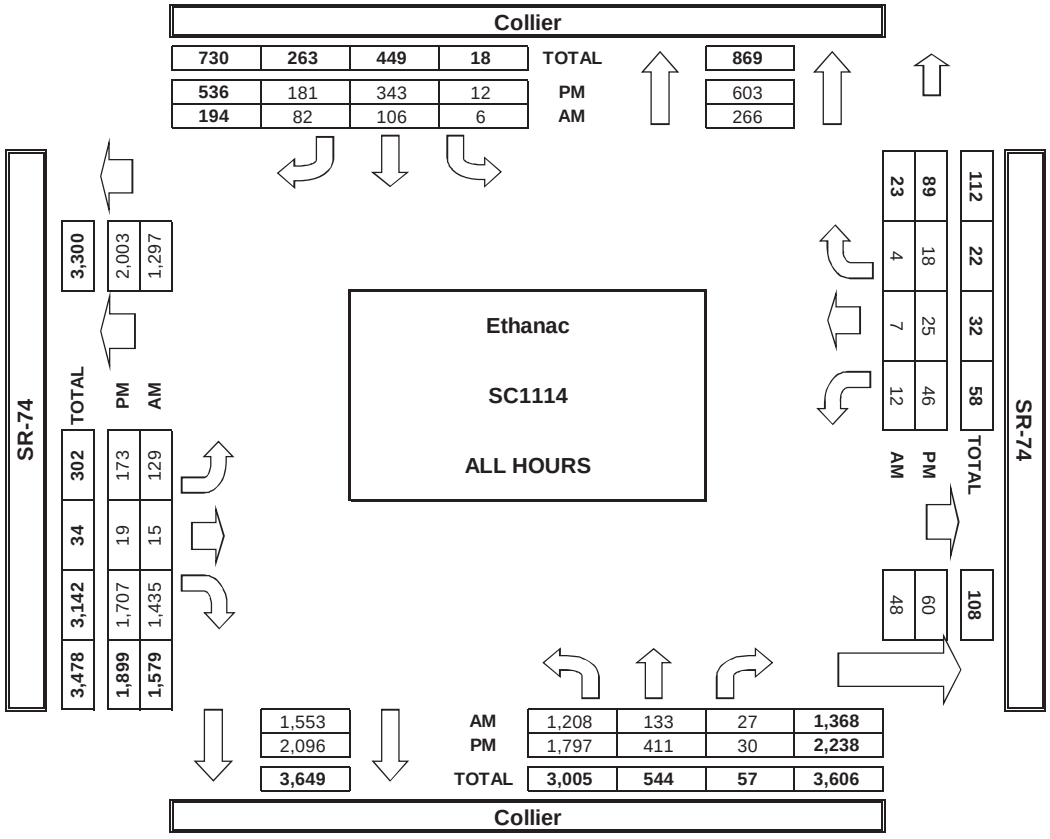
		NORTHBOUND Collier			SOUTHBOUND Collier			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL 1	NT 0.5	NR 0.5	SL 1	ST 1	SR 1	EL 0.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	147	12	0	0	15	13	29	0	170	0	0	0	386	0	0	0	0	0
	7:15 AM	165	14	0	1	10	13	18	0	180	0	0	0	401	0	0	0	0	0
	7:30 AM	144	11	2	1	18	17	18	1	219	0	0	0	431	0	0	0	0	0
	7:45 AM	162	14	5	0	11	11	12	1	200	1	0	0	417	0	0	0	0	0
	8:00 AM	152	21	4	0	14	11	13	4	197	2	1	0	419	0	0	0	0	0
	8:15 AM	159	14	5	2	22	5	15	3	154	1	1	2	383	0	0	0	0	0
	8:30 AM	145	22	7	1	7	7	11	6	163	5	3	1	378	0	0	0	0	0
	8:45 AM	134	25	4	1	9	5	13	0	152	3	2	1	349	0	0	0	0	0
	VOLUMES	1,208	133	27	6	106	82	129	15	1,435	12	7	4	3,164	0	0	0	0	0
	APPROACH %	88%	10%	2%	3%	55%	42%	8%	1%	91%	52%	30%	17%						
	APP/DEPART	1,368	/	266	194	/	1,553	1,579	/	48	23	/	1,297	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	623	60	11	2	53	52	61	6	796	3	1	0	1,668					
	APPROACH %	90%	9%	2%	2%	50%	49%	7%	1%	92%	75%	25%	0%						
	PEAK HR FACTOR		0.959			0.743			0.907			0.333		0.968					
	APP/DEPART	694	/	121	107	/	852	863	/	19	4	/	676	0					
PM	4:00 PM	228	48	3	8	40	16	24	6	207	9	5	2	596	0	0	0	0	0
	4:15 PM	236	59	10	1	36	14	33	2	207	11	1	5	615	0	0	0	0	0
	4:30 PM	201	58	5	1	54	30	24	9	230	5	5	3	625	0	0	0	0	0
	4:45 PM	196	47	2	1	42	21	17	1	203	7	4	3	544	0	1	0	0	1
	5:00 PM	229	55	3	0	52	30	20	1	199	7	3	4	603	0	0	0	0	0
	5:15 PM	245	48	4	1	41	26	19	0	222	4	4	1	615	0	0	0	0	0
	5:30 PM	228	47	2	0	33	23	16	0	239	3	2	0	593	0	0	0	0	0
	5:45 PM	234	49	1	0	45	21	20	0	200	0	1	0	571	0	0	0	0	0
	VOLUMES	1,797	411	30	12	343	181	173	19	1,707	46	25	18	4,762	0	1	0	0	1
	APPROACH %	80%	18%	1%	2%	64%	34%	9%	1%	90%	52%	28%	20%						
	APP/DEPART	2,238	/	603	536	/	2,096	1,899	/	60	89	/	2,003	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	871	208	14	3	189	107	80	11	854	23	16	11	2,387					
	APPROACH %	80%	19%	1%	1%	63%	36%	8%	1%	90%	46%	32%	22%						
	PEAK HR FACTOR		0.896			0.879			0.898			0.735		0.955					
	APP/DEPART	1,093	/	300	299	/	1,066	945	/	27	50	/	994	0					

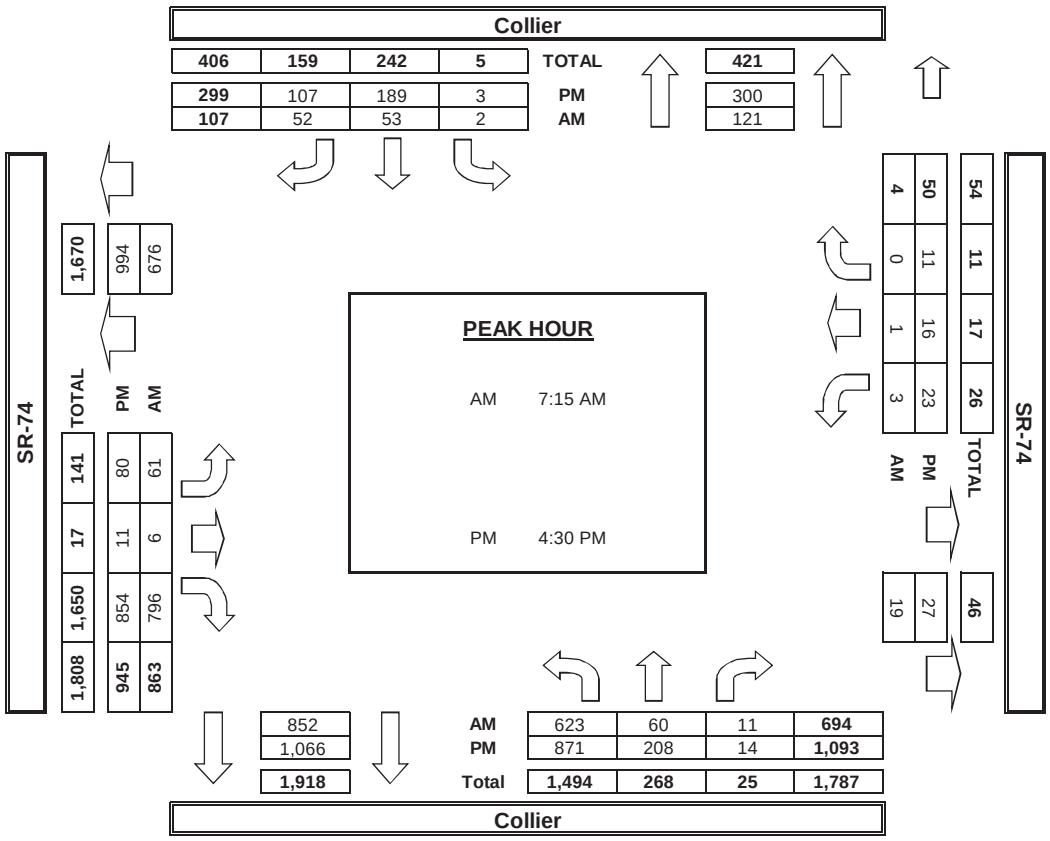


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	7:15 AM	1	0	6	0	7	1	0	6	0	7	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:00 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:15 AM	0	0	3	0	3	0	0	3	0	3	0	0	0	0	0
	8:30 AM	0	1	1	0	2	0	1	1	0	2	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	1	14	0	16	1	1	13	0	15	0	0	1	0	1
PM	4:00 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:30 PM	0	1	1	2	4	0	0	0	2	2	0	1	1	0	2
	5:45 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	TOTAL	0	1	5	2	8	0	0	3	2	5	0	1	2	0	3

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

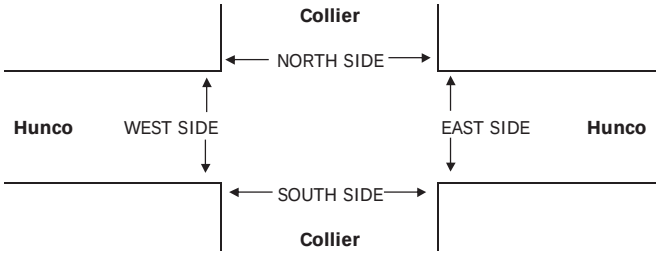
PREPARED BY: AimTD LLC. tel: 951 249 3226 pacific@aimtd.com

DATE:					
Thu, Nov 6, 14	LOCATION:	Lake Elsinore	PROJECT #:	SC0476
	NORTH & SOUTH:	Collier	LOCATION #:	4
	EAST & WEST:	Hunco	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

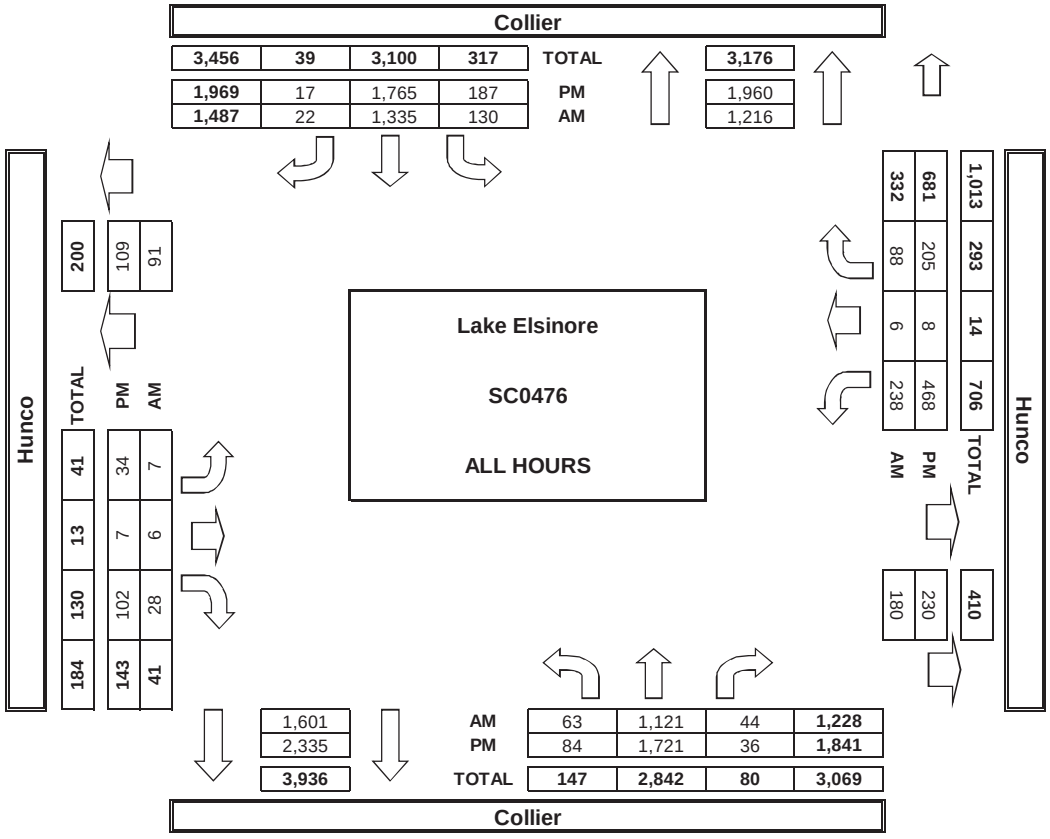
		NORTHBOUND (Collier)			SOUTHBOUND (Collier)			EASTBOUND (Hunco)			WESTBOUND (Hunco)				U-TURNS				
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
	LANES:	1	2	0	1	2	0	0	1	0	1	1	1		X	X	X	X	
AM	7:00 AM	4	173	8	3	150	2	0	0	2	22	0	8	372	0	0	0	0	0
	7:15 AM	3	163	8	10	190	1	0	0	1	25	0	8	409	0	0	0	0	0
	7:30 AM	11	133	4	14	187	2	0	0	3	12	1	10	377	1	0	0	0	1
	7:45 AM	14	143	3	12	190	5	0	0	4	25	0	12	408	0	0	0	0	0
	8:00 AM	9	123	4	16	164	5	1	1	6	34	1	11	375	0	0	0	0	0
	8:15 AM	11	137	6	19	150	3	1	4	2	34	3	14	384	0	0	0	0	0
	8:30 AM	7	130	10	32	148	2	1	0	4	33	0	14	381	0	0	0	0	0
	8:45 AM	4	119	1	24	156	2	4	1	6	53	1	11	382	0	0	0	0	0
	VOLUMES	63	1,121	44	130	1,335	22	7	6	28	238	6	88	3,089	1	0	0	0	1
	APPROACH %	5%	91%	4%	9%	90%	1%	17%	15%	68%	72%	2%	27%						
	APP/DEPART	1,229	/	1,216	1,487	/	1,602	41	/	180	332	/	91	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	37	562	19	52	731	13	1	1	14	96	2	41	1,569					
	APPROACH %	6%	91%	3%	7%	92%	2%	6%	6%	88%	69%	1%	29%						
	PEAK HR FACTOR		0.888			0.961			0.500			0.755		0.959					
	APP/DEPART	618	/	604	796	/	841	16	/	72	139	/	52	0					
PM	4:00 PM	12	219	2	27	210	2	2	1	14	67	6	24	586	0	0	0	0	0
	4:15 PM	4	212	7	32	237	4	2	0	8	66	0	25	597	0	0	0	0	0
	4:30 PM	13	245	5	23	230	2	4	1	13	76	0	21	633	0	0	0	0	0
	4:45 PM	7	191	5	20	208	2	7	0	7	58	2	29	536	2	0	0	0	2
	5:00 PM	17	209	6	23	243	3	5	3	18	47	0	30	604	1	0	0	0	1
	5:15 PM	18	238	2	15	206	0	4	0	19	56	0	25	583	1	0	0	0	1
	5:30 PM	7	207	4	19	224	3	6	1	9	50	0	28	558	0	0	0	0	0
	5:45 PM	6	200	5	28	207	1	4	1	14	48	0	23	537	1	0	0	0	1
	VOLUMES	84	1,721	36	187	1,765	17	34	7	102	468	8	205	4,639	5	0	0	0	5
	APPROACH %	5%	93%	2%	9%	90%	1%	24%	5%	71%	69%	1%	30%						
	APP/DEPART	1,846	/	1,960	1,969	/	2,340	143	/	230	681	/	109	0					
	BEGIN PEAK HR		4:15 PM																
	VOLUMES	41	857	23	98	918	11	18	4	46	247	2	105	2,370					
	APPROACH %	4%	93%	2%	10%	89%	1%	26%	6%	68%	70%	1%	30%						
	PEAK HR FACTOR		0.875			0.940			0.654			0.912		0.936					
	APP/DEPART	921	/	980	1,027	/	1,211	68	/	125	354	/	54	0					

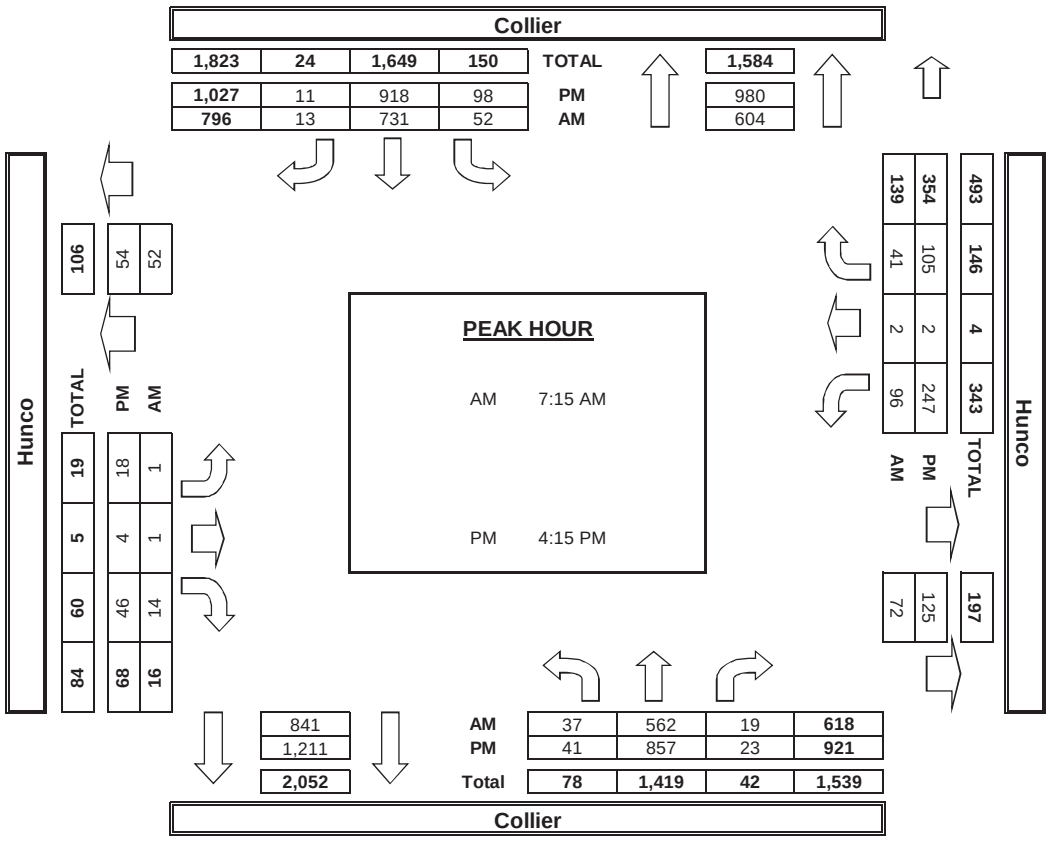


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Apr 18, 17

LOCATION: Lake Elsinore
NORTH & SOUTH: Collier
EAST & WEST: Central

PROJECT #: SC1294
LOCATION #: 1
CONTROL: SIGNAL

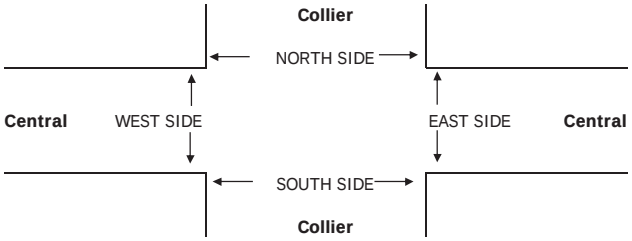
NOTES: PM EB queue

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

☑ Add U-Turns to Left Turns

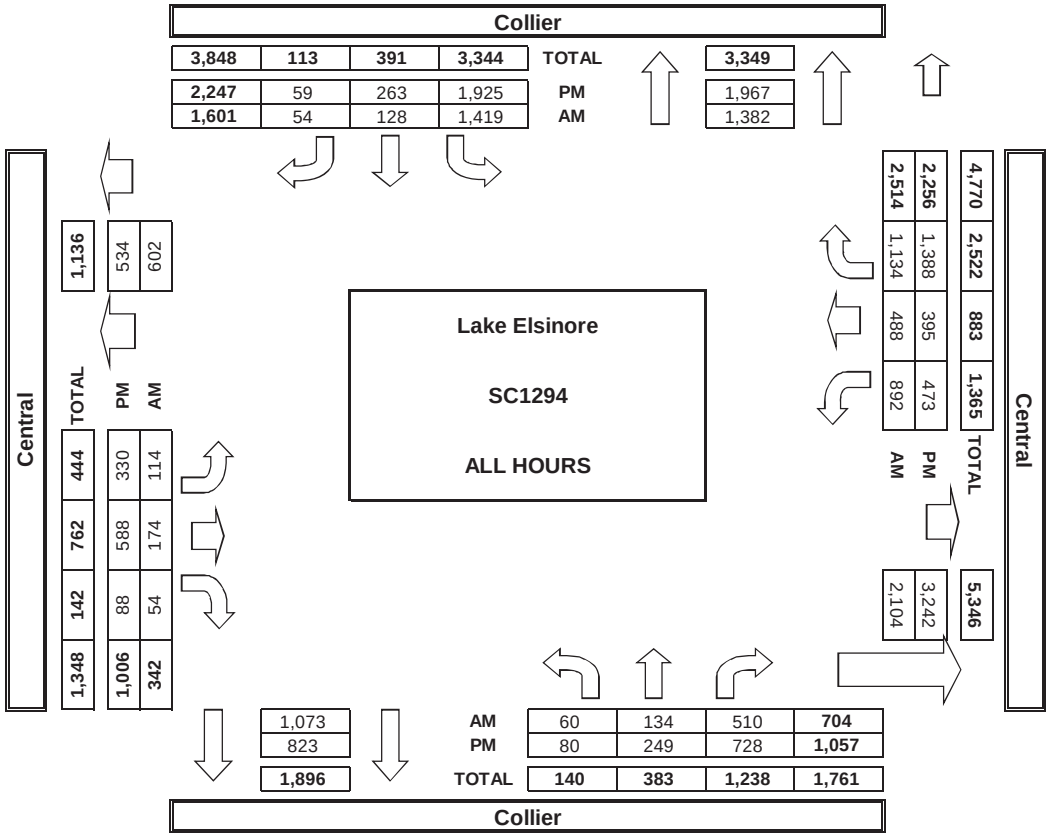
		NORTHBOUND (Collier)			SOUTHBOUND (Collier)			EASTBOUND (Central)			WESTBOUND (Central)				U-TURNS				
	LANES:	NL 1	NT 1	NR 1	SL 2	ST 2	SR 1	EL 2	ET 2	ER 0	WL 2	WT 1	WR 2	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	3	6	72	170	10	2	7	20	3	155	56	161	665	0	0	0	0	0
	7:15 AM	6	10	103	202	19	4	14	13	8	174	62	161	776	0	0	0	0	0
	7:30 AM	5	16	66	207	11	3	9	24	11	111	54	116	633	0	0	0	0	0
	7:45 AM	5	15	58	193	16	13	18	20	9	120	84	149	700	0	0	0	1	1
	8:00 AM	7	16	51	198	21	5	19	15	7	113	54	145	651	0	0	0	0	0
	8:15 AM	7	23	57	147	17	10	9	27	8	76	65	129	575	0	0	0	0	0
	8:30 AM	9	18	47	180	16	12	17	26	4	75	53	117	574	0	0	0	0	0
	8:45 AM	18	30	56	122	18	5	21	29	4	68	60	156	587	0	0	0	0	0
	VOLUMES	60	134	510	1,419	128	54	114	174	54	892	488	1,134	5,161	0	0	0	1	1
	APPROACH %	9%	19%	72%	89%	8%	3%	33%	51%	16%	35%	19%	45%						
	APP/DEPART	704	/	1,382	1,601	/	1,073	342	/	2,104	2,514	/	602	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	19	47	299	772	56	22	48	77	31	560	256	587	2,774					
	APPROACH %	5%	13%	82%	91%	7%	3%	31%	49%	20%	40%	18%	42%						
	PEAK HR FACTOR		0.767			0.944			0.830			0.884		0.894					
	APP/DEPART	365	/	682	850	/	646	156	/	1,149	1,403	/	297	0					
PM	4:00 PM	10	30	106	245	27	7	38	73	13	55	51	170	825	0	0	0	0	0
	4:15 PM	11	34	87	243	37	6	30	49	9	50	50	158	764	0	0	0	0	0
	4:30 PM	11	30	116	225	35	12	48	88	11	71	39	160	846	0	0	0	0	0
	4:45 PM	9	35	87	266	43	11	49	85	13	74	41	199	912	0	0	0	0	0
	5:00 PM	10	30	103	252	35	5	60	100	3	63	51	154	866	0	0	0	0	0
	5:15 PM	10	31	58	242	28	5	34	80	10	49	50	179	776	0	0	0	1	1
	5:30 PM	14	33	109	235	25	7	35	58	12	53	61	189	831	0	0	0	0	0
	5:45 PM	5	26	62	217	33	6	36	55	17	58	52	179	746	0	0	0	0	0
	VOLUMES	80	249	728	1,925	263	59	330	588	88	473	395	1,388	6,566	0	0	0	1	1
	APPROACH %	8%	24%	69%	86%	12%	3%	33%	58%	9%	21%	18%	62%						
	APP/DEPART	1,057	/	1,967	2,247	/	823	1,006	/	3,242	2,256	/	534	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	40	126	364	985	141	33	191	353	37	257	181	692	3,400					
	APPROACH %	8%	24%	69%	85%	12%	3%	33%	61%	6%	23%	16%	61%						
	PEAK HR FACTOR		0.844			0.905			0.891			0.900		0.932					
	APP/DEPART	530	/	1,009	1,159	/	434	581	/	1,703	1,130	/	254	0					

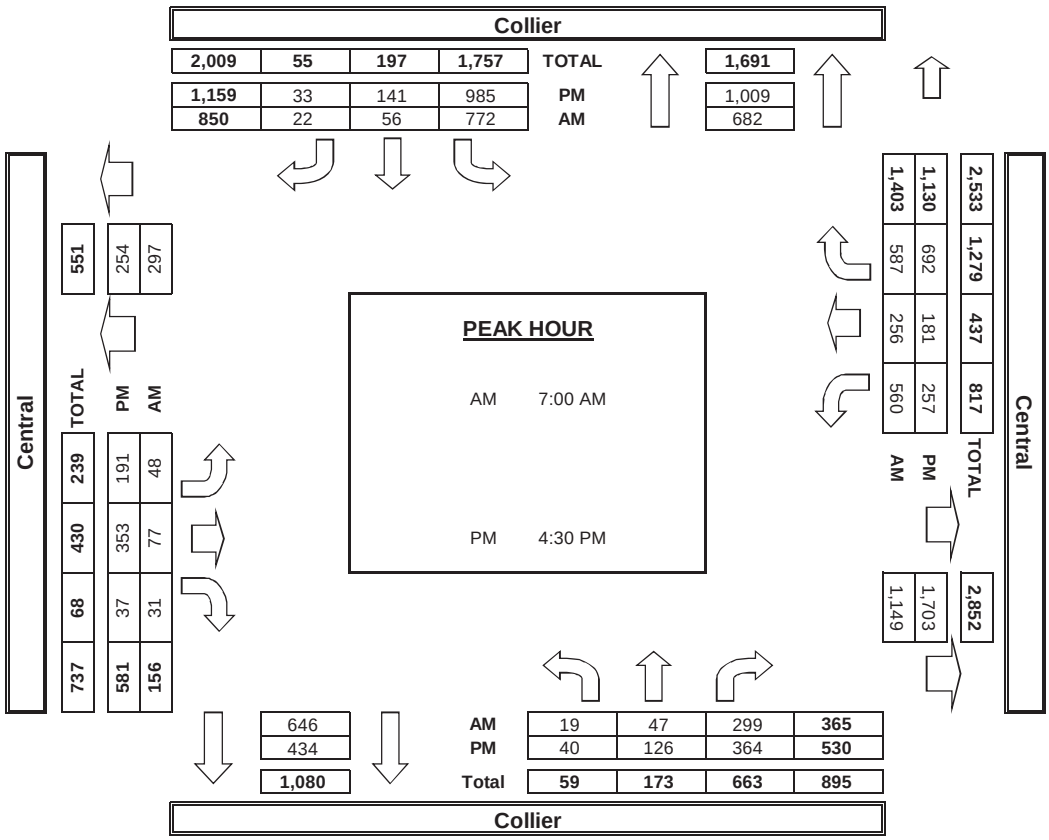


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	1	0	0	1	2	1	0	0	1	2	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	7:45 AM	1	1	0	0	2	1	0	0	0	1	0	1	0	0	1
	8:00 AM	1	0	0	2	3	0	0	0	1	1	1	0	0	1	2
	8:15 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	2	0	0	2	4	1	0	0	2	3	1	0	0	0	1
	TOTAL	6	1	0	6	13	4	0	0	5	9	2	1	0	1	4
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	2	0	0	2	4	2	0	0	2	4	0	0	0	0	0
	4:30 PM	2	0	0	0	2	1	0	0	0	1	1	0	0	0	1
	4:45 PM	1	0	0	2	3	1	0	0	2	3	0	0	0	0	0
	5:00 PM	1	0	0	2	3	0	0	0	1	1	1	0	0	1	2
	5:15 PM	2	0	0	5	7	1	0	0	4	5	1	0	0	1	2
	5:30 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	5:45 PM	3	0	0	5	8	1	0	0	3	4	2	0	0	2	4
	TOTAL	12	0	0	16	28	7	0	0	12	19	5	0	0	4	9

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

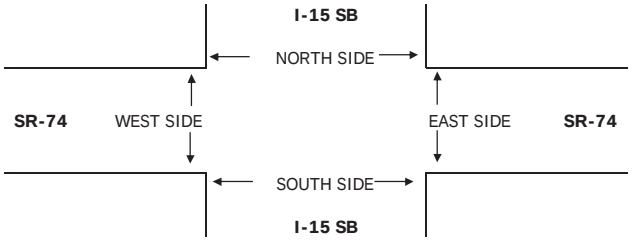
DATE:	LOCATION:	Ethanac	PROJECT #:	SC1114
Thu, Oct 27, 16	NORTH & SOUTH:	I-15 SB	LOCATION #:	15
	EAST & WEST:	SR-74	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

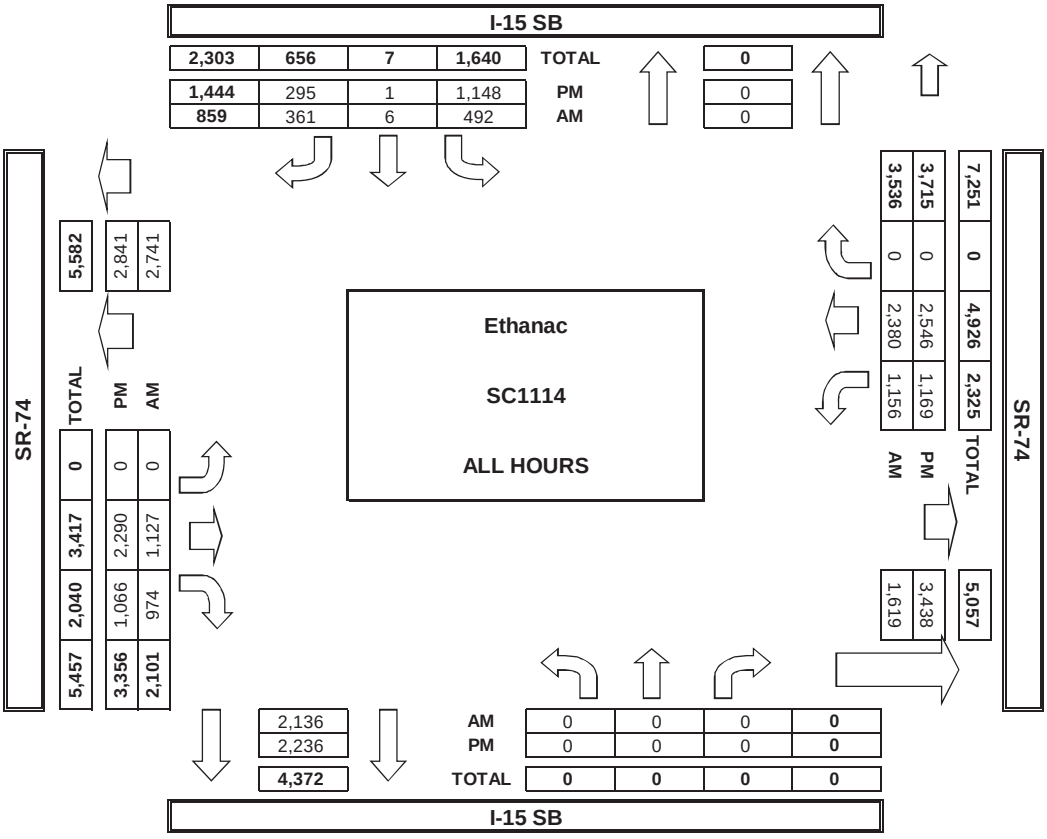
		NORTHBOUND I-15 SB			SOUTHBOUND I-15 SB			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL X	NT X	NR X	SL 1.3	ST 0.3	SR 1.3	EL X	ET 2	ER 1	WL 2	WT 2	WR X	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	59	0	35	0	165	96	138	327	0	820	0	0	0	0	0
	7:15 AM	0	0	0	60	0	42	0	165	108	178	367	0	920	0	0	0	0	0
	7:30 AM	0	0	0	58	1	36	0	151	170	189	301	0	906	0	0	0	0	0
	7:45 AM	0	0	0	58	2	56	0	136	111	159	361	0	883	0	0	0	0	0
	8:00 AM	0	0	0	59	2	42	0	147	156	135	281	0	822	0	0	0	0	0
	8:15 AM	0	0	0	59	0	46	0	131	111	104	246	0	697	0	0	0	0	0
	8:30 AM	0	0	0	64	1	56	0	118	111	116	245	0	711	0	0	0	0	0
	8:45 AM	0	0	0	75	0	48	0	114	111	137	252	0	737	0	0	0	0	0
	VOLUMES	0	0	0	492	6	361	0	1,127	974	1,156	2,380	0	6,496	0	0	0	0	0
	APPROACH %	0%	0%	0%	57%	1%	42%	0%	54%	46%	33%	67%	0%						
	APP/DEPART	0	/	0	859	/	2,136	2,101	/	1,619	3,536	/	2,741	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	0	0	0	235	5	176	0	599	545	661	1,310	0	3,531					
	APPROACH %	0%	0%	0%	56%	1%	42%	0%	52%	48%	34%	66%	0%						
	PEAK HR FACTOR		0.000			0.897			0.891			0.904		0.960					
	APP/DEPART	0	/	0	416	/	1,211	1,144	/	834	1,971	/	1,486	0					
PM	4:00 PM	0	0	0	170	0	37	0	282	145	133	321	0	1,088	0	0	0	0	0
	4:15 PM	0	0	0	132	0	41	0	282	124	174	330	0	1,083	0	0	0	0	0
	4:30 PM	0	0	0	117	0	34	0	282	155	160	284	0	1,032	0	0	0	0	0
	4:45 PM	0	0	0	143	0	30	0	299	136	120	350	0	1,078	0	0	0	0	0
	5:00 PM	0	0	0	169	0	47	0	268	148	142	303	0	1,077	0	0	0	0	0
	5:15 PM	0	0	0	122	1	34	0	300	128	158	302	0	1,045	0	0	0	0	0
	5:30 PM	0	0	0	154	0	35	0	283	115	145	324	0	1,056	0	0	0	0	0
	5:45 PM	0	0	0	141	0	37	0	294	115	137	332	0	1,056	0	0	0	0	0
	VOLUMES	0	0	0	1,148	1	295	0	2,290	1,066	1,169	2,546	0	8,515	0	0	0	0	0
	APPROACH %	0%	0%	0%	80%	0%	20%	0%	68%	32%	31%	69%	0%						
	APP/DEPART	0	/	0	1,444	/	2,236	3,356	/	3,438	3,715	/	2,841	0					
	BEGIN PEAK HR		4:00 PM																
	VOLUMES	0	0	0	562	0	142	0	1,145	560	587	1,285	0	4,281					
	APPROACH %	0%	0%	0%	80%	0%	20%	0%	67%	33%	31%	69%	0%						
	PEAK HR FACTOR		0.000			0.850			0.975			0.929		0.984					
	APP/DEPART	0	/	0	704	/	1,147	1,705	/	1,707	1,872	/	1,427	0					

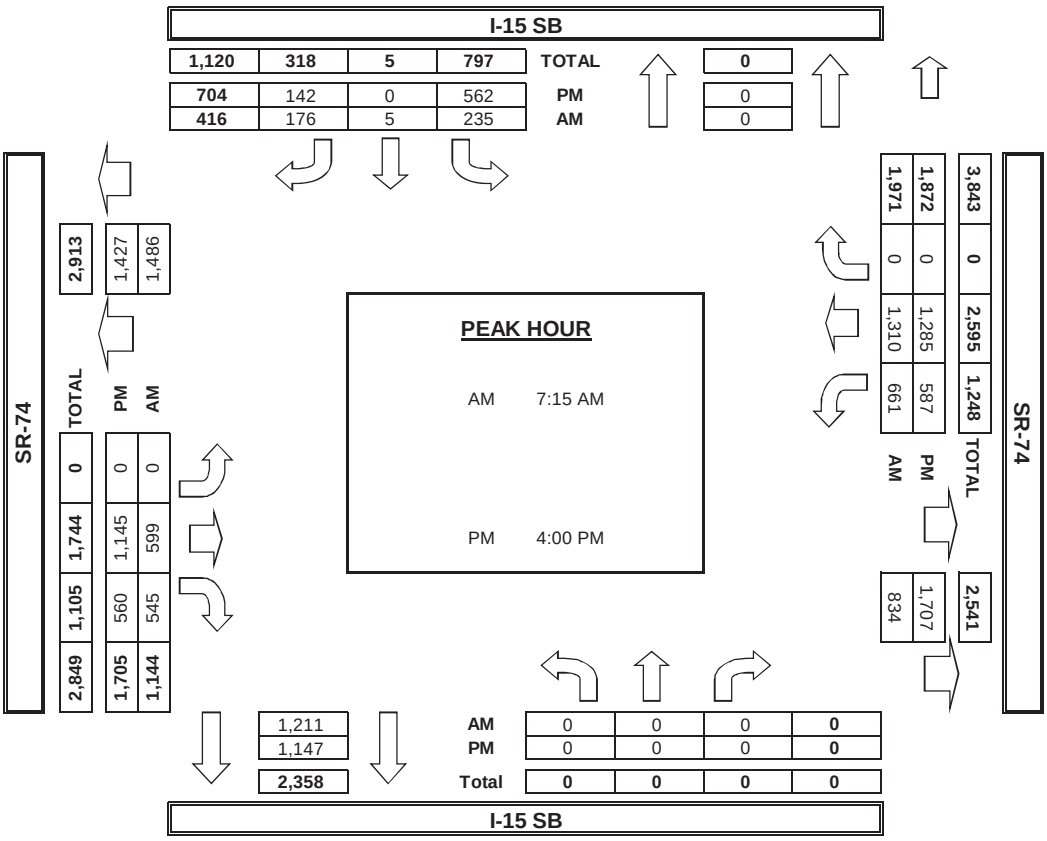


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	7:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:30 AM	2	3	0	0	5	2	3	0	0	5	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
	8:30 AM	3	0	0	0	3	2	0	0	0	2	1	0	0	0	1
	8:45 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	TOTAL	10	4	0	0	14	8	4	0	0	12	2	0	0	0	2
PM	4:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	4	0	0	0	4	3	0	0	0	3	1	0	0	0	1
	5:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	5	0	0	0	5	5	0	0	0	5	0	0	0	0	0
	TOTAL	12	0	0	0	12	8	0	0	0	8	4	0	0	0	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: I-15 NB
EAST & WEST: SR-74

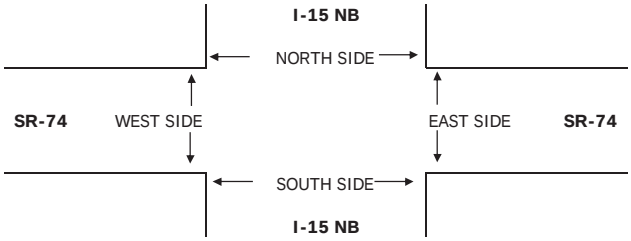
PROJECT #: SC1114
LOCATION #: 16
CONTROL: SIGNAL

NOTES:
PM EB/WB queue

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

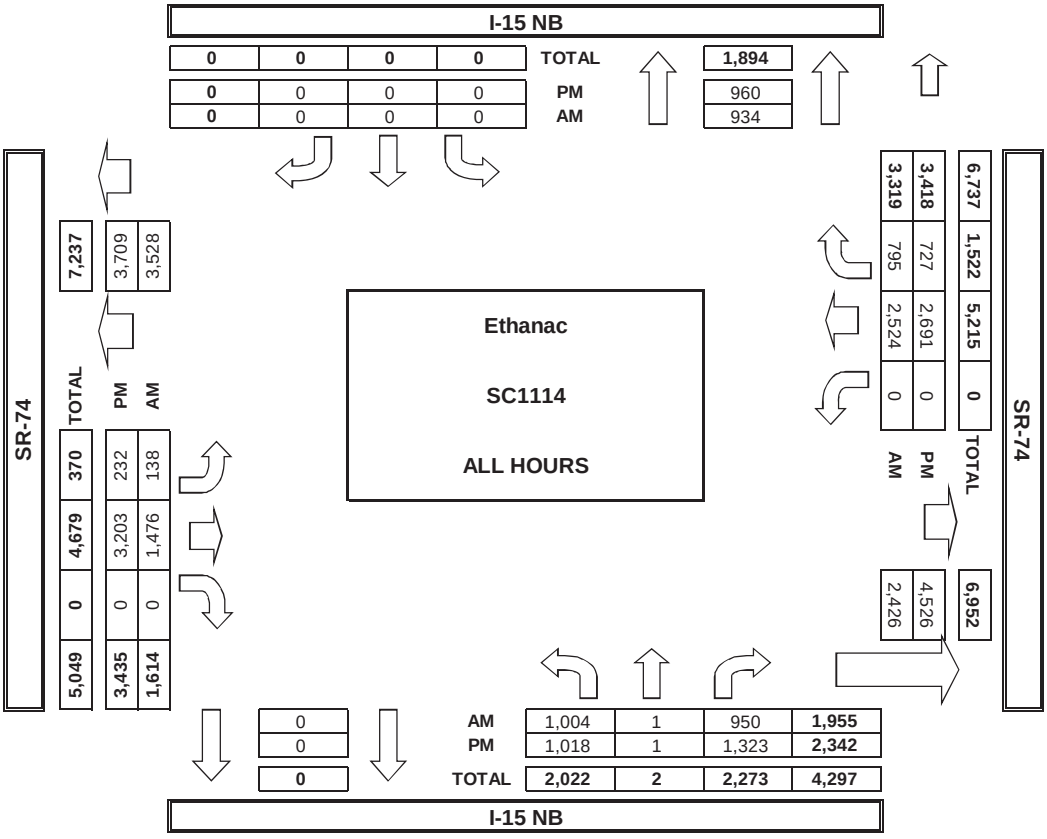
		NORTHBOUND I-15 NB			SOUTHBOUND I-15 NB			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL 1.3	NT 0.3	NR 1.3	SL X	ST X	SR X	EL 1	ET 3	ER X	WL X	WT 3	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	118	0	155	0	0	0	12	210	0	0	345	118	958	0	0	0	0	0
	7:15 AM	114	0	142	0	0	0	14	212	0	0	428	125	1,035	0	0	0	0	0
	7:30 AM	129	0	136	0	0	0	15	194	0	0	358	109	941	0	0	0	0	0
	7:45 AM	154	0	120	0	0	0	19	173	0	0	367	92	925	0	0	0	0	0
	8:00 AM	119	0	100	0	0	0	22	184	0	0	296	109	830	0	0	0	0	0
	8:15 AM	112	1	104	0	0	0	23	168	0	0	239	80	727	0	0	0	0	0
	8:30 AM	129	0	97	0	0	0	15	166	0	0	232	79	718	0	0	0	0	0
	8:45 AM	129	0	96	0	0	0	18	169	0	0	259	83	754	0	0	0	0	0
	VOLUMES	1,004	1	950	0	0	0	138	1,476	0	0	2,524	795	6,888	0	0	0	0	0
	APPROACH %	51%	0%	49%	0%	0%	0%	9%	91%	0%	0%	76%	24%						
	APP/DEPART	1,955	/	934	0	/	0	1,614	/	2,426	3,319	/	3,528	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	515	0	553	0	0	0	60	789	0	0	1,498	444	3,859					
	APPROACH %	48%	0%	52%	0%	0%	0%	7%	93%	0%	0%	77%	23%						
	PEAK HR FACTOR		0.974			0.000			0.939			0.878		0.932					
	APP/DEPART	1,068	/	504	0	/	0	849	/	1,342	1,942	/	2,013	0					
PM	4:00 PM	131	1	167	0	0	0	34	419	0	0	323	94	1,169	0	0	0	0	0
	4:15 PM	130	0	168	0	0	0	31	381	0	0	375	74	1,159	0	0	0	0	0
	4:30 PM	125	0	143	0	0	0	31	369	0	0	317	88	1,073	0	0	0	0	0
	4:45 PM	110	0	168	0	0	0	28	414	0	0	358	83	1,161	0	0	0	0	0
	5:00 PM	140	0	166	0	0	0	30	408	0	0	304	90	1,138	0	0	0	0	0
	5:15 PM	128	0	182	0	0	0	29	392	0	0	331	109	1,171	0	0	0	0	0
	5:30 PM	132	0	192	0	0	0	30	405	0	0	337	96	1,192	0	0	0	0	0
	5:45 PM	122	0	137	0	0	0	19	415	0	0	346	93	1,132	0	0	0	0	0
	VOLUMES	1,018	1	1,323	0	0	0	232	3,203	0	0	2,691	727	9,195	0	0	0	0	0
	APPROACH %	43%	0%	56%	0%	0%	0%	7%	93%	0%	0%	79%	21%						
	APP/DEPART	2,342	/	960	0	/	0	3,435	/	4,526	3,418	/	3,709	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	510	0	708	0	0	0	117	1,619	0	0	1,330	378	4,662					
	APPROACH %	42%	0%	58%	0%	0%	0%	7%	93%	0%	0%	78%	22%						
	PEAK HR FACTOR		0.940			0.000			0.982			0.968		0.978					
	APP/DEPART	1,218	/	495	0	/	0	1,736	/	2,327	1,708	/	1,840	0					

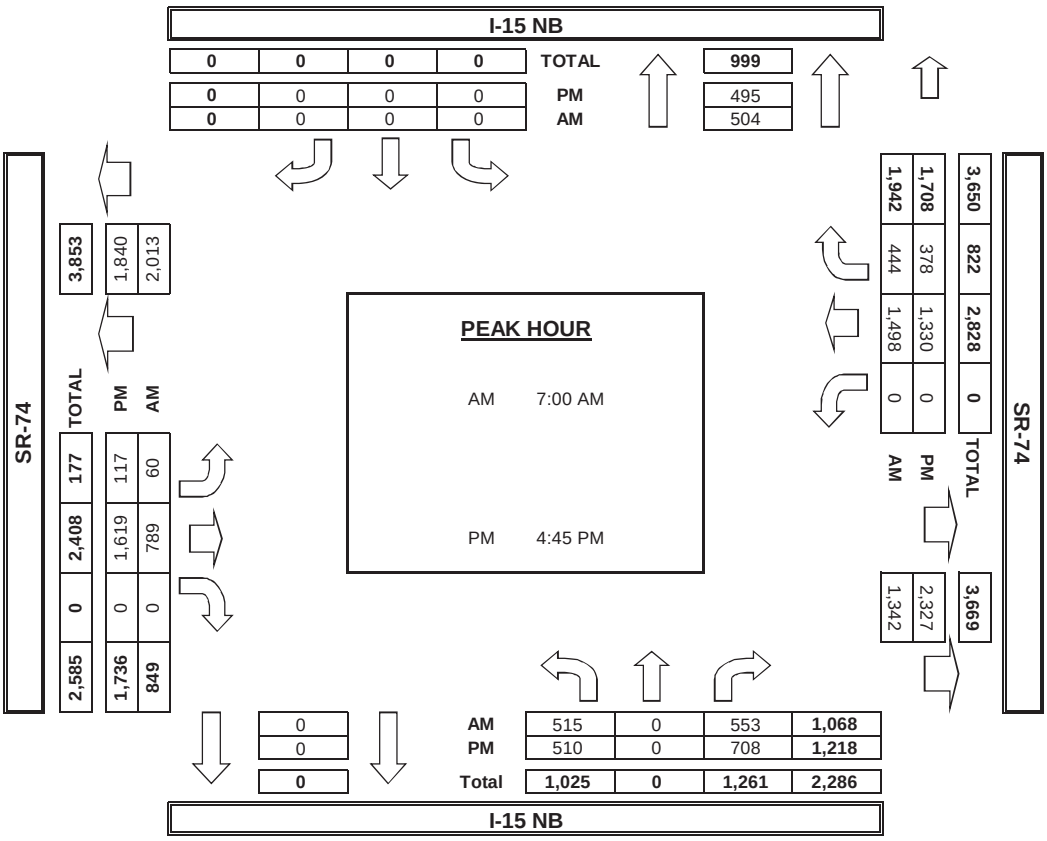


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	3	0	0	0	3	3	0	0	0	3	0	0	0	0	0
	7:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:30 AM	4	3	0	0	7	4	3	0	0	7	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
	8:30 AM	3	0	0	0	3	2	0	0	0	2	1	0	0	0	1
	8:45 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	TOTAL	14	4	0	0	18	12	4	0	0	16	2	0	0	0	2
PM	4:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	4	0	0	0	4	3	0	0	0	3	1	0	0	0	1
	5:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	5	0	0	0	5	5	0	0	0	5	0	0	0	0	0
	TOTAL	12	0	0	0	12	8	0	0	0	8	4	0	0	0	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Oct 27, 16

LOCATION: Ethanac
NORTH & SOUTH: Dexter
EAST & WEST: SR-74

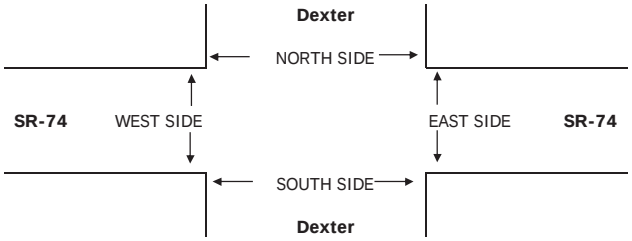
PROJECT #: SC1114
LOCATION #: 17
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

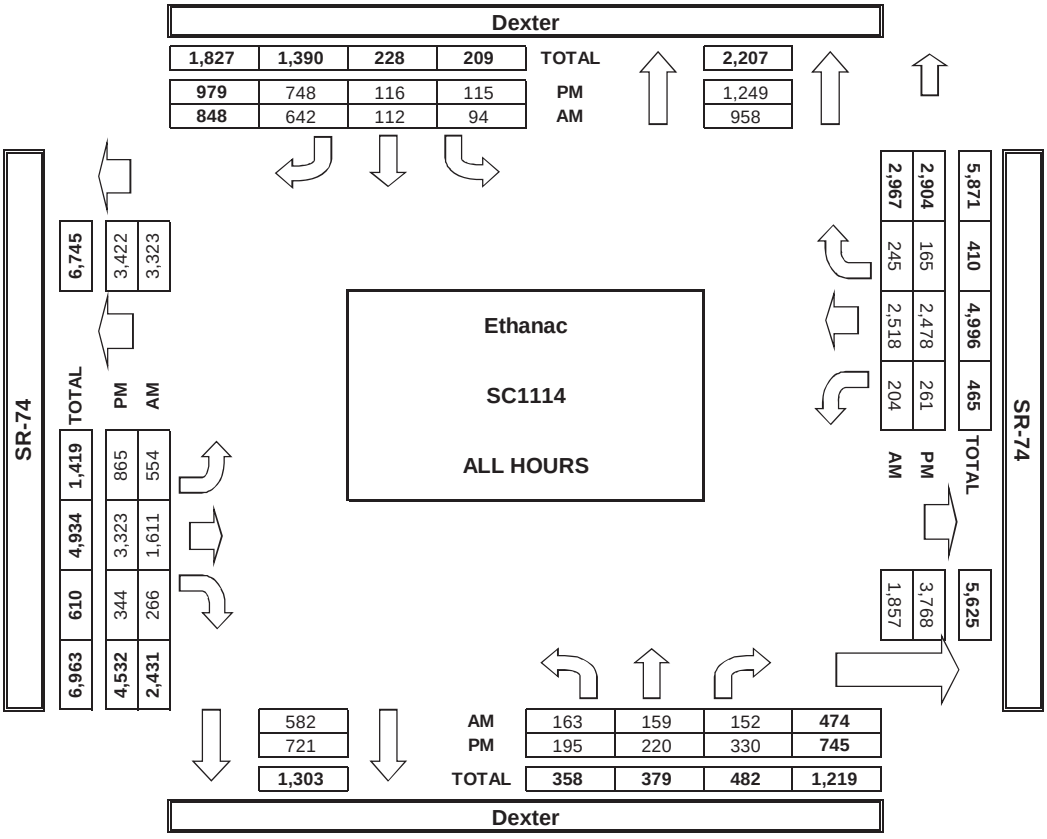
		NORTHBOUND Dexter			SOUTHBOUND Dexter			EASTBOUND SR-74			WESTBOUND SR-74				U-TURNS				
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 1	EL 1	ET 3	ER 1	WL 1	WT 4	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	25	62	20	11	20	115	107	230	30	23	326	64	1,033	0	0	0	0	0
	7:15 AM	20	30	20	22	32	160	96	238	19	25	372	54	1,088	0	0	0	0	0
	7:30 AM	20	20	29	22	31	112	59	249	24	36	335	27	964	0	0	0	0	0
	7:45 AM	17	18	23	15	6	58	55	206	31	35	384	23	871	0	0	0	0	0
	8:00 AM	18	5	19	7	5	47	59	173	53	26	340	29	781	0	0	0	0	0
	8:15 AM	19	8	8	7	5	55	62	176	34	16	244	17	651	0	0	0	0	0
	8:30 AM	21	6	16	7	7	57	54	175	34	14	235	15	641	0	0	0	0	0
	8:45 AM	23	10	17	3	6	38	62	164	41	29	282	16	691	0	0	0	0	0
	VOLUMES	163	159	152	94	112	642	554	1,611	266	204	2,518	245	6,720	0	0	0	0	0
	APPROACH %	34%	34%	32%	11%	13%	76%	23%	66%	11%	7%	85%	8%						
	APP/DEPART	474	/	958	848	/	582	2,431	/	1,857	2,967	/	3,323	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	82	130	92	70	89	445	317	923	104	119	1,417	168	3,956					
	APPROACH %	27%	43%	30%	12%	15%	74%	24%	69%	8%	7%	83%	10%						
	PEAK HR FACTOR		0.710			0.706			0.916			0.945		0.909					
	APP/DEPART	304	/	615	604	/	312	1,344	/	1,085	1,704	/	1,944	0					
PM	4:00 PM	20	29	43	17	14	84	105	438	46	35	313	32	1,176	0	0	0	0	0
	4:15 PM	28	28	37	11	12	109	121	390	38	34	314	19	1,141	0	0	0	0	0
	4:30 PM	30	25	43	21	13	106	105	374	36	30	271	22	1,076	0	0	0	0	0
	4:45 PM	25	24	41	13	18	81	114	428	39	45	336	18	1,182	0	0	1	0	1
	5:00 PM	21	23	47	17	17	91	97	430	46	25	281	18	1,113	0	0	0	0	0
	5:15 PM	26	33	35	18	20	93	110	433	33	35	321	20	1,177	0	0	0	0	0
	5:30 PM	21	26	43	10	12	83	109	438	50	27	328	18	1,165	0	0	0	0	0
	5:45 PM	24	32	41	8	10	101	104	392	56	30	314	18	1,130	0	0	0	0	0
	VOLUMES	195	220	330	115	116	748	865	3,323	344	261	2,478	165	9,160	0	0	1	0	1
	APPROACH %	26%	30%	44%	12%	12%	76%	19%	73%	8%	9%	85%	6%						
	APP/DEPART	745	/	1,249	979	/	721	4,532	/	3,768	2,904	/	3,422	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	93	106	166	58	67	348	430	1,729	168	132	1,266	74	4,637					
	APPROACH %	25%	29%	45%	12%	14%	74%	18%	74%	7%	9%	86%	5%						
	PEAK HR FACTOR		0.971			0.903			0.974			0.922		0.981					
	APP/DEPART	365	/	609	473	/	367	2,327	/	1,953	1,472	/	1,708	0					

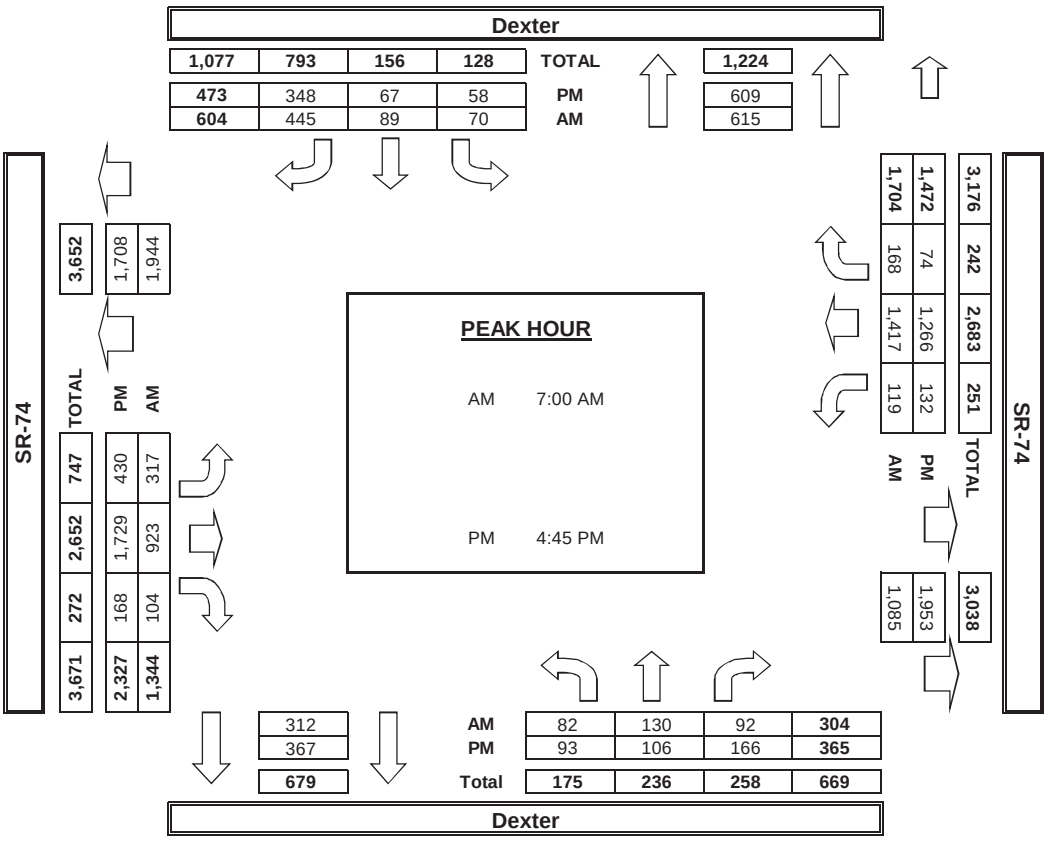


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	7:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	7:30 AM	3	3	2	0	8	3	3	2	0	8	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
	8:30 AM	2	0	3	0	5	1	0	2	0	3	1	0	1	0	2
	8:45 AM	2	0	1	0	3	2	0	1	0	3	0	0	0	0	0
	TOTAL	9	3	8	0	20	8	3	7	0	18	1	0	1	0	2
PM	4:00 PM	7	2	4	0	13	4	2	4	0	10	3	0	0	0	3
	4:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	2	1	2	0	5	1	1	1	0	3	1	0	1	0	2
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:30 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:45 PM	4	0	4	0	8	4	0	2	0	6	0	0	2	0	2
	TOTAL	14	3	12	0	29	9	3	9	0	21	5	0	3	0	8

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Lake Elsinore	PROJECT #:	SC1384
Wed, Jun 21, 17	NORTH & SOUTH:	Gunnerson	LOCATION #:	1
	EAST & WEST:	Riverside	CONTROL:	STOP N/S

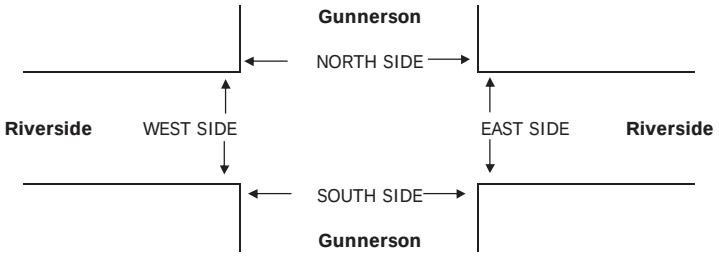
NOTES:

AM EB queue

AM PM MD OTHER OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND Gunnerson			SOUTHBOUND Gunnerson			EASTBOUND Riverside			WESTBOUND Riverside				U-TURNS				
	LANES:	NL 0	NT 1	NR 1	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	1	4	0	0	1	130	1	0	117	9	263	0	0	0	0	0
	7:15 AM	0	0	0	11	2	0	0	183	0	1	107	4	308	0	0	0	0	0
	7:30 AM	0	0	1	23	1	0	1	191	0	1	103	1	322	0	0	0	0	0
	7:45 AM	0	0	3	9	0	1	0	204	0	2	120	7	346	0	0	0	0	0
	8:00 AM	0	0	1	11	0	0	0	225	4	3	118	11	373	0	0	0	0	0
	8:15 AM	1	0	4	9	0	1	1	224	5	0	133	5	383	0	0	0	0	0
	8:30 AM	0	1	2	4	3	2	3	203	15	2	108	5	348	0	0	0	0	0
	8:45 AM	0	1	1	12	1	1	2	207	0	1	129	3	358	0	0	0	0	0
	VOLUMES	1	2	13	83	7	5	8	1,567	25	10	935	45	2,701	0	0	0	0	0
	APPROACH %	6%	13%	81%	87%	7%	5%	1%	98%	2%	1%	94%	5%						
	APP/DEPART	16	/	55	95	/	42	1,600	/	1,663	990	/	941	0					
	BEGIN PEAK HR		8:00 AM																
	VOLUMES	1	2	8	36	4	4	6	859	24	6	488	24	1,462					
	APPROACH %	9%	18%	73%	82%	9%	9%	1%	97%	3%	1%	94%	5%						
	PEAK HR FACTOR		0.550			0.786			0.966			0.938		0.954					
	APP/DEPART	11	/	32	44	/	34	889	/	903	518	/	493	0					
PM	4:00 PM	0	0	4	6	1	3	1	237	1	3	199	25	480	0	0	0	0	0
	4:15 PM	0	0	3	8	1	1	1	227	1	1	170	17	430	0	0	0	0	0
	4:30 PM	0	0	1	11	0	1	1	256	0	2	226	25	523	0	0	0	0	0
	4:45 PM	0	1	2	8	0	1	0	222	1	2	204	22	463	0	0	0	0	0
	5:00 PM	0	1	3	6	1	2	0	201	0	0	200	28	442	0	0	0	0	0
	5:15 PM	0	0	3	2	0	1	0	216	0	2	220	25	469	0	0	0	0	0
	5:30 PM	0	0	1	6	0	1	0	220	1	1	228	16	474	0	0	0	0	0
	5:45 PM	0	0	0	8	0	1	1	218	1	1	221	28	479	0	0	0	0	0
	VOLUMES	0	2	17	55	3	11	4	1,797	5	12	1,668	186	3,760	0	0	0	0	0
	APPROACH %	0%	11%	89%	80%	4%	16%	0%	100%	0%	1%	89%	10%						
	APP/DEPART	19	/	192	69	/	20	1,806	/	1,869	1,866	/	1,679	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	0	2	9	27	1	5	1	895	1	6	850	100	1,897					
	APPROACH %	0%	18%	82%	82%	3%	15%	0%	100%	0%	1%	89%	10%						
	PEAK HR FACTOR		0.688			0.688			0.873			0.945		0.907					
	APP/DEPART	11	/	103	33	/	8	897	/	931	956	/	855	0					



INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

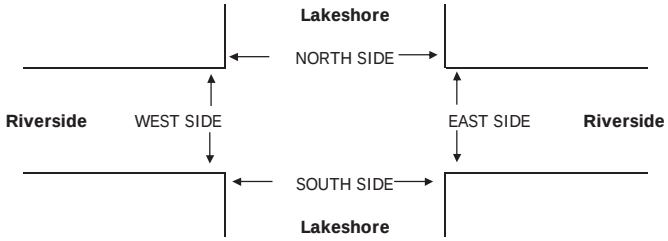
DATE:	LOCATION:	Lake Elsinore	PROJECT #:	SC
Tue, May 23, 17	NORTH & SOUTH:	Lakeshore	LOCATION #:	8
	EAST & WEST:	Riverside	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

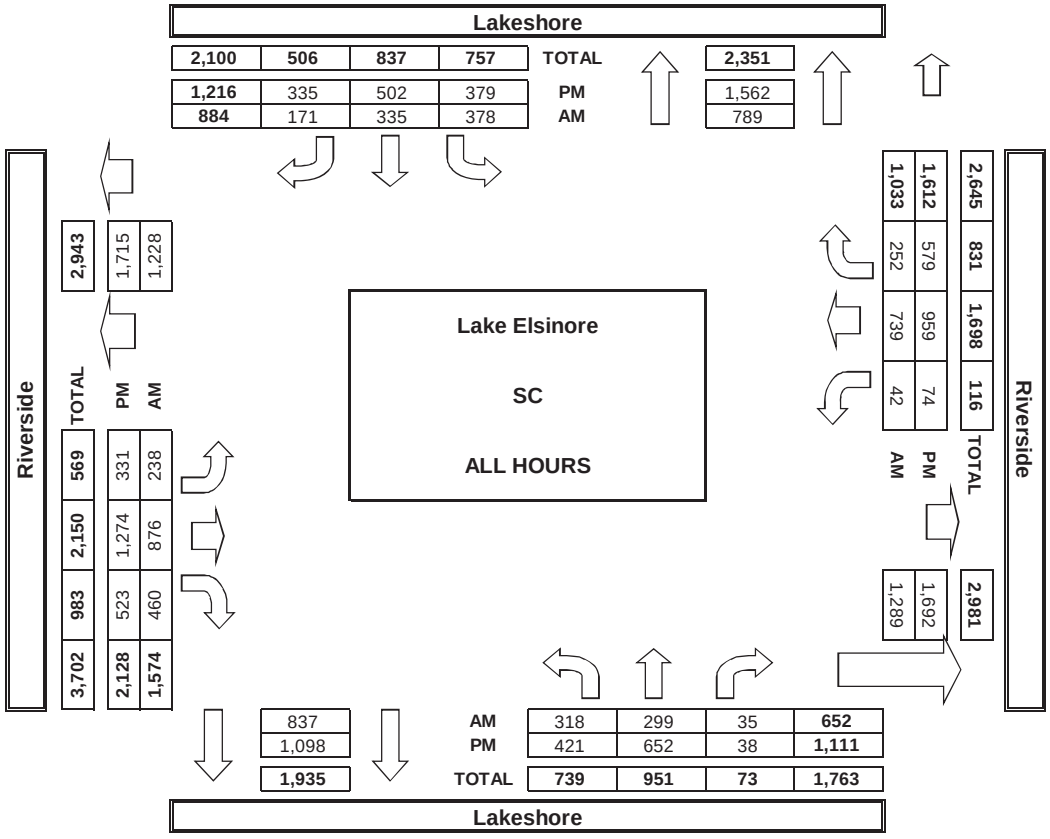
		NORTHBOUND (Lakeshore)			SOUTHBOUND (Lakeshore)			EASTBOUND (Riverside)			WESTBOUND (Riverside)				U-TURNS				
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 2	ER 1	WL 1	WT 1	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	46	36	4	45	48	22	25	126	63	3	101	31	550	0	0	0	0	0
	7:15 AM	39	32	4	53	34	17	39	145	72	7	100	22	564	0	0	0	0	0
	7:30 AM	35	46	4	60	43	27	37	112	51	5	87	36	543	0	0	0	0	0
	7:45 AM	38	36	3	38	53	27	25	99	40	6	107	41	513	0	0	0	0	0
	8:00 AM	43	38	7	54	40	18	23	96	59	7	84	26	495	0	0	0	0	0
	8:15 AM	39	36	4	43	41	18	24	85	54	6	96	38	484	0	0	0	0	0
	8:30 AM	34	28	5	42	35	14	32	101	61	2	80	27	461	0	0	0	0	0
	8:45 AM	44	47	4	43	41	28	33	112	60	6	84	31	533	0	0	0	0	0
	VOLUMES	318	299	35	378	335	171	238	876	460	42	739	252	4,143	0	0	0	0	0
	APPROACH %	49%	46%	5%	43%	38%	19%	15%	56%	29%	4%	72%	24%						
	APP/DEPART	652	/	789	884	/	837	1,574	/	1,289	1,033	/	1,228	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	158	150	15	196	178	93	126	482	226	21	395	130	2,170					
	APPROACH %	49%	46%	5%	42%	38%	20%	15%	58%	27%	4%	72%	24%						
	PEAK HR FACTOR		0.939			0.898			0.814			0.886		0.962					
	APP/DEPART	323	/	406	467	/	425	834	/	693	546	/	646	0					
PM	4:00 PM	55	93	5	49	66	41	43	165	81	12	143	76	829	0	0	0	0	0
	4:15 PM	52	82	6	50	62	29	36	201	68	10	126	80	802	0	0	0	0	0
	4:30 PM	52	75	7	46	78	45	37	144	65	16	140	81	786	0	0	0	0	0
	4:45 PM	51	76	0	43	55	52	43	154	70	10	122	68	744	0	0	0	1	1
	5:00 PM	57	108	5	50	65	36	43	172	59	3	105	72	775	0	0	0	0	0
	5:15 PM	55	81	5	44	56	48	52	148	64	12	113	67	745	0	0	0	0	0
	5:30 PM	43	65	4	49	68	44	39	178	60	10	103	75	738	0	0	0	0	0
	5:45 PM	56	72	6	48	52	40	38	112	56	1	107	60	648	0	0	0	0	0
	VOLUMES	421	652	38	379	502	335	331	1,274	523	74	959	579	6,067	0	0	0	1	1
	APPROACH %	38%	59%	3%	31%	41%	28%	16%	60%	25%	5%	59%	36%						
	APP/DEPART	1,111	/	1,562	1,216	/	1,098	2,128	/	1,692	1,612	/	1,715	0					
	BEGIN PEAK HR		4:00 PM																
	VOLUMES	210	326	18	188	261	167	159	664	284	48	531	305	3,161					
	APPROACH %	38%	59%	3%	31%	42%	27%	14%	60%	26%	5%	60%	35%						
	PEAK HR FACTOR		0.905			0.911			0.907			0.932		0.953					
	APP/DEPART	554	/	790	616	/	592	1,107	/	871	884	/	908	0					

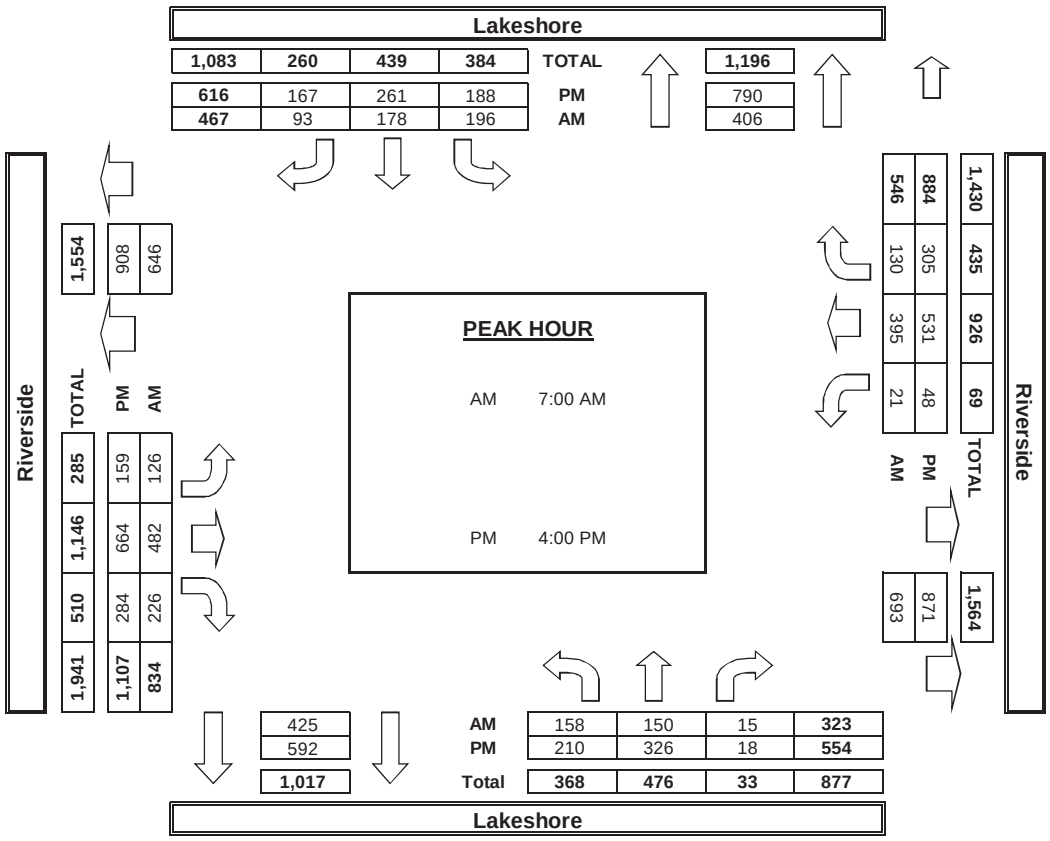


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





Tuesday, June 20, 2017 Location: Lake Elsinore PROJECT: SC1384

ADT Collier between Riverside and Central. **Prepared by AimTD tel. 714 253 7888**

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
0:00	36		19					12:00	229		180				
0:15	24		19					12:15	226		208				
0:30	24		18					12:30	221		163				
0:45	26	110	23	79			189	12:45	187	863	209	760			1623
1:00	26		11					13:00	239		209				
1:15	14		11					13:15	216		238				
1:30	9		7					13:30	224		222				
1:45	16	65	11	40			105	13:45	240	919	214	883			1802
2:00	12		10					14:00	206		199				
2:15	14		6					14:15	230		210				
2:30	14		5					14:30	202		209				
2:45	19	59	19	40			99	14:45	180	818	173	791			1609
3:00	15		17					15:00	212		221				
3:15	11		19					15:15	219		201				
3:30	24		26					15:30	200		190				
3:45	31	81	26	88			169	15:45	252	883	213	825			1708
4:00	29		42					16:00	216		221				
4:15	46		47					16:15	236		225				
4:30	88		61					16:30	288		269				
4:45	146	309	73	223			532	16:45	230	970	244	959			1929
5:00	170		88					17:00	289		215				
5:15	173		85					17:15	260		226				
5:30	165		116					17:30	274		194				
5:45	140	648	150	439			1087	17:45	240	1063	217	852			1915
6:00	124		119					18:00	235		221				
6:15	126		115					18:15	235		216				
6:30	138		149					18:30	201		201				
6:45	132	520	155	538			1058	18:45	223	894	208	846			1740
7:00	136		129					19:00	229		211				
7:15	121		192					19:15	190		191				
7:30	129		214					19:30	187		193				
7:45	149	535	265	800			1335	19:45	183	789	172	767			1556
8:00	163		247					20:00	192		167				
8:15	133		262					20:15	160		178				
8:30	141		262					20:30	181		135				
8:45	160	597	281	1052			1649	20:45	167	700	102	582			1282
9:00	145		235					21:00	150		114				
9:15	164		255					21:15	129		83				
9:30	173		270					21:30	144		81				
9:45	172	654	243	1003			1657	21:45	82	505	55	333			838
10:00	163		192					22:00	101		53				
10:15	179		178					22:15	88		41				
10:30	170		190					22:30	62		46				
10:45	202	714	209	769			1483	22:45	63	314	40	180			494
11:00	221		204					23:00	47		31				
11:15	208		226					23:15	50		28				
11:30	201		176					23:30	55		31				
11:45	214	844	189	795			1639	23:45	38	190	15	105			295
Total Vol.		5136		5866			**11002**			8908		7883			**16791**

Daily Totals

NB	SB	EB	WB	Combined
14044	13749			**27793**

	AM			PM		
Split %	46.7%	53.3%	**39.6%**	53.1%	46.9%	**60.4%**
Peak Hour	11:45	8:00	**8:45**	16:30	16:00	**16:30**
Volume	890	1052	**1683**	1067	959	**2021**
P.H.F.	0.97	0.94	**0.95**	0.95	0.89	**0.91**

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Wednesday, August 09, 2017 Location: Lake Elsinore PROJECT: SC

ADT1 Riverside west of Collier. **Prepared by AimTD tel. 714 253 7888**

AM Period	EB		WB			PM Period	EB		WB		
0:00	17		40			12:00	209		201		
0:15	19		27			12:15	173		180		
0:30	18		33			12:30	208		185		
0:45	18	72	15	115	187	12:45	170	760	209	775	1535
1:00	10		29			13:00	175		183		
1:15	21		23			13:15	161		168		
1:30	9		9			13:30	202		194		
1:45	15	55	22	83	138	13:45	175	713	186	731	1444
2:00	12		12			14:00	177		212		
2:15	14		11			14:15	188		185		
2:30	7		14			14:30	198		233		
2:45	7	40	13	50	90	14:45	201	764	189	819	1583
3:00	13		11			15:00	217		226		
3:15	19		11			15:15	242		224		
3:30	37		13			15:30	298		206		
3:45	36	105	27	62	167	15:45	261	1018	219	875	1893
4:00	39		46			16:00	377		226		
4:15	59		52			16:15	294		220		
4:30	75		90			16:30	220		251		
4:45	94	267	140	328	595	16:45	223	1114	247	944	2058
5:00	103		123			17:00	242		226		
5:15	98		165			17:15	203		280		
5:30	133		170			17:30	244		257		
5:45	117	451	158	616	1067	17:45	239	928	223	986	1914
6:00	109		136			18:00	280		197		
6:15	110		132			18:15	220		211		
6:30	158		152			18:30	202		213		
6:45	177	554	118	538	1092	18:45	260	962	213	834	1796
7:00	168		131			19:00	193		201		
7:15	172		133			19:15	162		203		
7:30	188		113			19:30	188		188		
7:45	200	728	117	494	1222	19:45	159	702	198	790	1492
8:00	163		115			20:00	161		196		
8:15	144		97			20:15	150		148		
8:30	205		118			20:30	136		195		
8:45	146	658	137	467	1125	20:45	101	548	165	704	1252
9:00	165		121			21:00	104		137		
9:15	146		139			21:15	82		131		
9:30	163		160			21:30	68		124		
9:45	178	652	150	570	1222	21:45	58	312	106	498	810
10:00	141		174			22:00	49		77		
10:15	174		147			22:15	42		105		
10:30	198		157			22:30	41		82		
10:45	170	683	162	640	1323	22:45	29	161	77	341	502
11:00	194		167			23:00	46		78		
11:15	164		176			23:15	27		43		
11:30	211		192			23:30	29		48		
11:45	214	783	185	720	1503	23:45	35	137	43	212	349
Total Vol.	5048		4683		**9731**		8119		8509		**16628**

Daily Totals

EB	WB	Combined
13167	13192	**26359**

	AM			PM		
Split %	51.9%	48.1%	**36.9%**	48.8%	51.2%	**63.1%**
Peak Hour	11:30	11:30	**11:30**	15:30	16:45	**15:30**
Volume	807	758	**1565**	1230	1010	**2101**
P.H.F.	0.94	0.94	**0.95**	0.87	0.90	**0.87**

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Wednesday, May 10, 2017 | CITY: Lake Elsinore | PROJECT: SC1330

ADT1 Collier south of Nichols. | Prepared by: Field Data Services of Arizona | **Prepared by AimTD LLC tel. 714 253 7888**

AM Period	NB		SB		EB		WB			PM Period	NB		SB		EB		WB		
0:30	4		11		0		0			12:00	40		44		0		0		
0:15	2		4		0		0			12:15	48		50		0		0		
0:30	2		3		0		0			12:30	54		69		0		0		
0:45	1	9	0	18	0	0	0	0	27	12:45	65	207	44	207	0	0	0	0	414
1:00	0		5		0		0			13:00	47		54		0		0		
1:15	1		1		0		0			13:15	51		51		0		0		
1:30	4		3		0		0			13:30	58		54		0		0		
1:45	0	5	1	10	0	0	0	0	15	13:45	63	219	66	225	0	0	0	0	444
2:00	2		4		0		0			14:00	54		59		0		0		
2:15	1		2		0		0			14:15	49		68		0		0		
2:30	1		2		0		0			14:30	36		71		0		0		
2:45	2	6	1	9	0	0	0	0	15	14:45	78	217	71	269	0	0	0	0	486
3:00	5		5		0		0			15:00	76		64		0		0		
3:15	3		3		0		0			15:15	61		68		0		0		
3:30	7		15		0		0			15:30	70		60		0		0		
3:45	9	24	21	44	0	0	0	0	68	15:45	72	279	72	264	0	0	0	0	543
4:00	14		12		0		0			16:00	72		76		0		0		
4:15	14		24		0		0			16:15	82		82		0		0		
4:30	20		17		0		0			16:30	80		83		0		0		
4:45	14	62	35	88	0	0	0	0	150	16:45	86	320	80	321	0	0	0	0	641
5:00	32		20		0		0			17:00	88		58		0		0		
5:15	21		23		0		0			17:15	93		69		0		0		
5:30	30		40		0		0			17:30	63		70		0		0		
5:45	27	110	24	107	0	0	0	0	217	17:45	73	317	78	275	0	0	0	0	592
6:00	16		30		0		0			18:00	62		50		0		0		
6:15	28		24		0		0			18:15	62		62		0		0		
6:30	25		30		0		0			18:30	66		41		0		0		
6:45	35	104	34	118	0	0	0	0	222	18:45	43	233	40	193	0	0	0	0	426
7:00	33		30		0		0			19:00	33		33		0		0		
7:15	39		42		0		0			19:15	48		28		0		0		
7:30	28		36		0		0			19:30	37		33		0		0		
7:45	34	134	48	156	0	0	0	0	290	19:45	44	162	28	122	0	0	0	0	284
8:00	28		37		0		0			20:00	48		23		0		0		
8:15	38		31		0		0			20:15	32		17		0		0		
8:30	25		38		0		0			20:30	27		16		0		0		
8:45	26	117	34	140	0	0	0	0	257	20:45	26	133	32	88	0	0	0	0	221
9:00	28		38		0		0			21:00	23		18		0		0		
9:15	35		27		0		0			21:15	20		14		0		0		
9:30	30		35		0		0			21:30	20		17		0		0		
9:45	19	112	47	147	0	0	0	0	259	21:45	14	77	13	62	0	0	0	0	139
10:00	29		44		0		0			22:00	10		9		0		0		
10:15	30		46		0		0			22:15	6		8		0		0		
10:30	37		52		0		0			22:30	2		17		0		0		
10:45	37	133	48	190	0	0	0	0	323	22:45	4	22	10	44	0	0	0	0	66
11:00	44		45		0		0			23:00	8		8		0		0		
11:15	54		53		0		0			23:15	6		6		0		0		
11:30	29		51		0		0			23:30	7		6		0		0		
11:45	54	181	64	213	0	0	0	0	394	23:45	2	23	4	24	0	0	0	0	47
Total Vol.		997		1240					**2237**			2209		2094					**4303**

Daily Totals

NB	SB	EB	WB	**Combined**
3206	3334			**6540**

	AM					**PM**		
Split %	44.6%	55.4%			**34.2%**	51.3%	48.7%	**65.8%**
Peak Hour	11:45	11:45	0:30	0:30	**11:45**	16:30	16:00	**16:00**
Volume	196	227			**423**	347	321	**641**
P.H.F.	0.91	0.82			**0.86**	0.97	0.97	**0.97**

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Appendix C: LOS and Queuing Worksheets

Intersection	
Int Delay, s/veh	20.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	293	0	0	145	97	154	1	92	0	0	0
Future Vol, veh/h	72	293	0	0	145	97	154	1	92	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	114	465	0	0	230	154	244	2	146	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	384	0	-	-	-	0	1000	1077	465
Stage 1	-	-	-	-	-	-	693	693	-
Stage 2	-	-	-	-	-	-	307	384	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1174	-	0	0	-	-	270	219	597
Stage 1	-	-	0	0	-	-	496	445	-
Stage 2	-	-	0	0	-	-	746	611	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1174	-	-	-	-	-	~ 244	0	597
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 244	0	-
Stage 1	-	-	-	-	-	-	448	0	-
Stage 2	-	-	-	-	-	-	746	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	69.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	244	597	1174	-	-	-
HCM Lane V/C Ratio	1.008	0.245	0.097	-	-	-
HCM Control Delay (s)	103.5	13	8.4	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	9.7	1	0.3	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	237	291	45	254	0	0	0	0	129	4	59
Future Vol, veh/h	0	237	291	45	254	0	0	0	0	129	4	59
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	289	355	55	310	0	0	0	0	157	5	72
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	13.4	14.8	12.6
HCM LOS	B	B	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	237	291	45	254	133	59
LT Vol	0	0	45	0	129	0
Through Vol	237	0	0	254	4	0
RT Vol	0	291	0	0	0	59
Lane Flow Rate	289	355	55	310	162	72
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.471	0.508	0.101	0.529	0.333	0.123
Departure Headway (Hd)	5.863	5.153	6.651	6.143	7.381	6.178
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	616	699	538	585	487	579
Service Time	3.601	2.891	4.396	3.888	5.13	3.925
HCM Lane V/C Ratio	0.469	0.508	0.102	0.53	0.333	0.124
HCM Control Delay	13.7	13.1	10.1	15.6	13.8	9.8
HCM Lane LOS	B	B	B	C	B	A
HCM 95th-tile Q	2.5	2.9	0.3	3.1	1.4	0.4

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	399	32	100	203	22	92
Future Vol, veh/h	399	32	100	203	22	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	459	37	115	233	25	106

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	496	0	941	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	463	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1068	-	292	587
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1068	-	260	587
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	557	-
Stage 2	-	-	-	-	634	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	260	587	-	-	1068	-
HCM Lane V/C Ratio	0.097	0.18	-	-	0.108	-
HCM Control Delay (s)	20.3	12.5	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	6	796	3	1	0	623	60	11	2	53	52
Future Volume (veh/h)	61	6	796	3	1	0	623	60	11	2	53	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	63	6	821	3	1	0	642	62	11	2	55	54
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	470	40	1110	246	68	0	770	669	119	175	183	156
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.00	0.43	0.43	0.43	0.10	0.10	0.10
Sat Flow, veh/h	1331	149	1583	525	253	0	1774	1541	273	1774	1863	1583
Grp Volume(v), veh/h	69	0	821	4	0	0	642	0	73	2	55	54
Grp Sat Flow(s),veh/h/ln	1479	0	1583	778	0	0	1774	0	1814	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	19.2	0.0	1.4	0.1	1.6	1.9
Cycle Q Clear(g_c), s	1.8	0.0	16.0	1.8	0.0	0.0	19.2	0.0	1.4	0.1	1.6	1.9
Prop In Lane	0.91		1.00	0.75		0.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	510	0	1110	313	0	0	770	0	788	175	183	156
V/C Ratio(X)	0.14	0.00	0.74	0.01	0.00	0.00	0.83	0.00	0.09	0.01	0.30	0.35
Avail Cap(c_a), veh/h	510	0	1110	313	0	0	770	0	788	474	498	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	5.1	16.1	0.0	0.0	15.0	0.0	10.0	24.4	25.1	25.2
Incr Delay (d2), s/veh	0.1	0.0	2.7	0.0	0.0	0.0	10.3	0.0	0.2	0.0	0.9	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	14.0	0.0	0.0	0.0	11.5	0.0	0.8	0.0	0.9	0.9
LnGrp Delay(d),s/veh	16.8	0.0	7.7	16.1	0.0	0.0	25.3	0.0	10.2	24.4	26.0	26.5
LnGrp LOS	B		A	B			C		B	C	C	C
Approach Vol, veh/h		890			4			715			111	
Approach Delay, s/veh		8.4			16.1			23.8			26.2	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		20.0		9.9		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		21.2		18.0		3.9		3.8
Green Ext Time (p_c), s		1.2		0.0		0.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	14	97	2	41	41	620	21	52	739	13
Future Volume (veh/h)	1	1	14	97	2	41	41	620	21	52	739	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	1	1	15	101	2	43	43	646	22	54	770	14
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	20	186	341	246	209	114	1896	848	134	1945	35
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.06	0.54	0.54	0.08	0.55	0.55
Sat Flow, veh/h	35	153	1412	1392	1863	1583	1774	3539	1583	1774	3556	65
Grp Volume(v), veh/h	17	0	0	101	2	43	43	646	22	54	383	401
Grp Sat Flow(s),veh/h/ln	1600	0	0	1392	1863	1583	1774	1770	1583	1774	1770	1851
Q Serve(g_s), s	0.0	0.0	0.0	2.6	0.0	1.1	1.1	4.8	0.3	1.4	5.8	5.8
Cycle Q Clear(g_c), s	0.4	0.0	0.0	3.0	0.0	1.1	1.1	4.8	0.3	1.4	5.8	5.8
Prop In Lane	0.06		0.88	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	293	0	0	341	246	209	114	1896	848	134	968	1013
V/C Ratio(X)	0.06	0.00	0.00	0.30	0.01	0.21	0.38	0.34	0.03	0.40	0.40	0.40
Avail Cap(c_a), veh/h	626	0	0	635	638	543	266	1896	848	266	968	1013
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	0.0	18.9	17.6	18.1	21.0	6.2	5.1	20.6	6.1	6.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	2.1	0.5	0.1	1.9	1.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.3	0.0	0.5	0.6	2.5	0.1	0.7	3.1	3.2
LnGrp Delay(d),s/veh	17.9	0.0	0.0	19.3	17.6	18.6	23.0	6.6	5.2	22.5	7.3	7.3
LnGrp LOS	B			B	B	B	C	A	A	C	A	A
Approach Vol, veh/h		17			146			711			838	
Approach Delay, s/veh		17.9			19.1			7.6			8.3	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	29.0		10.2	7.0	29.5		10.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.4	6.8		2.4	3.1	7.8		5.0
Green Ext Time (p_c), s	0.0	3.7		0.0	0.0	4.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	692	40	126	364	1029	147	34
Future Volume (veh/h)	191	353	37	257	181	692	40	126	364	1029	147	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	215	397	42	289	203	778	45	142	409	1156	165	38
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	485	51	344	286	1527	187	331	440	1358	1652	739
Arrive On Green	0.10	0.15	0.15	0.03	0.05	0.05	0.11	0.18	0.18	0.39	0.47	0.47
Sat Flow, veh/h	3442	3232	340	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	215	216	223	289	203	778	45	142	409	1156	165	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.1	10.9	27.6	2.3	1.2
Cycle Q Clear(g_c), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.1	10.9	27.6	2.3	1.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	332	265	270	344	286	1527	187	331	440	1358	1652	739
V/C Ratio(X)	0.65	0.82	0.82	0.84	0.71	0.51	0.24	0.43	0.93	0.85	0.10	0.05
Avail Cap(c_a), veh/h	332	315	320	344	352	1626	187	331	440	1358	1652	739
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	39.2	37.0	37.1	42.8	40.7	15.0	36.9	32.9	17.6	24.8	13.4	13.1
Incr Delay (d2), s/veh	4.4	13.2	13.8	13.0	3.8	0.2	0.7	4.0	28.5	5.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	6.2	6.4	4.2	5.3	7.1	1.1	3.5	8.2	14.0	1.2	0.5
LnGrp Delay(d),s/veh	43.6	50.2	50.9	55.8	44.5	15.2	37.6	37.0	46.1	30.0	13.5	13.2
LnGrp LOS	D	D	D	E	D	B	D	D	D	C	B	B
Approach Vol, veh/h		654			1270			596			1359	
Approach Delay, s/veh		48.3			29.1			43.3			27.5	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.5	20.0	13.0	17.5	13.5	46.0	12.7	17.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	33.0	16.0	9.0	16.0	7.0	42.0	8.0	17.0
Max Q Clear Time (g_c+I1), s	29.6	12.9	9.5	12.8	4.1	4.3	7.4	11.7
Green Ext Time (p_c), s	1.7	0.7	0.0	0.7	0.0	1.1	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	34.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	599	545	661	1310	0	0	0	0	235	5	176
Future Volume (veh/h)	0	599	545	661	1310	0	0	0	0	235	5	176
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	624	568	689	1365	0				304	0	124
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1298	581	774	2251	0				976	0	435
Arrive On Green	0.00	0.12	0.12	0.45	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	624	568	689	1365	0				304	0	124
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	14.8	32.2	16.5	0.0	0.0				6.1	0.0	5.5
Cycle Q Clear(g_c), s	0.0	14.8	32.2	16.5	0.0	0.0				6.1	0.0	5.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1298	581	774	2251	0				976	0	435
V/C Ratio(X)	0.00	0.48	0.98	0.89	0.61	0.00				0.31	0.00	0.28
Avail Cap(c_a), veh/h	0	1298	581	994	2477	0				976	0	435
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.42	0.42	0.57	0.57	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.6	39.2	23.7	0.0	0.0				25.9	0.0	25.7
Incr Delay (d2), s/veh	0.0	0.1	19.3	5.0	0.2	0.0				0.8	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	17.3	8.2	0.1	0.0				3.1	0.0	2.6
LnGrp Delay(d),s/veh	0.0	31.7	58.5	28.8	0.2	0.0				26.7	0.0	27.3
LnGrp LOS		C	E	C	A					C		C
Approach Vol, veh/h		1192			2054						428	
Approach Delay, s/veh		44.4			9.8						26.9	
Approach LOS		D			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.2	37.0		28.8		61.2
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			26.0	33.0		19.0		63.0
Max Q Clear Time (g_c+I1), s			18.5	34.2		8.1		2.0
Green Ext Time (p_c), s			1.7	0.0		1.2		16.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	789	0	0	1498	444	515	0	553	0	0	0
Future Volume (veh/h)	60	789	0	0	1498	444	515	0	553	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	65	848	0	0	1611	477	745	0	390			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	111	2384	0	0	1840	573	1569	0	700			
Arrive On Green	0.12	0.94	0.00	0.00	0.72	0.72	0.44	0.00	0.44			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	65	848	0	0	1611	477	745	0	390			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	3.1	1.4	0.0	0.0	21.5	18.8	13.3	0.0	16.4			
Cycle Q Clear(g_c), s	3.1	1.4	0.0	0.0	21.5	18.8	13.3	0.0	16.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	111	2384	0	0	1840	573	1569	0	700			
V/C Ratio(X)	0.59	0.36	0.00	0.00	0.88	0.83	0.47	0.00	0.56			
Avail Cap(c_a), veh/h	158	2712	0	0	2034	633	1569	0	700			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.83	0.83	0.00	0.00	0.69	0.69	1.00	0.00	1.00			
Uniform Delay (d), s/veh	38.3	1.5	0.0	0.0	10.9	10.5	17.7	0.0	18.6			
Incr Delay (d2), s/veh	4.0	0.1	0.0	0.0	3.0	6.1	1.0	0.0	3.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.5	0.0	0.0	10.0	8.6	6.7	0.0	7.8			
LnGrp Delay(d),s/veh	42.3	1.6	0.0	0.0	13.9	16.6	18.7	0.0	21.8			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		913			2088			1135				
Approach Delay, s/veh		4.5			14.5			19.8				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		43.8		46.2			9.6	36.6
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		34.0		48.0			8.0	36.0
Max Q Clear Time (g_c+I1), s		18.4		3.4			5.1	23.5
Green Ext Time (p_c), s		4.0		6.3			0.0	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	923	104	119	1417	168	82	130	92	70	89	445
Future Volume (veh/h)	317	923	104	119	1417	168	82	130	92	70	89	445
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	348	1014	114	131	1557	185	90	143	101	77	98	489
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	2128	662	164	1897	469	344	362	256	364	663	903
Arrive On Green	0.43	0.84	0.84	0.09	0.30	0.30	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	825	1017	719	1131	1863	1583
Grp Volume(v), veh/h	348	1014	114	131	1557	185	90	0	244	77	98	489
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	825	0	1736	1131	1863	1583
Q Serve(g_s), s	16.6	4.9	1.2	6.5	20.3	8.4	7.5	0.0	9.5	4.9	3.2	17.3
Cycle Q Clear(g_c), s	16.6	4.9	1.2	6.5	20.3	8.4	10.7	0.0	9.5	14.4	3.2	17.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	381	2128	662	164	1897	469	344	0	618	364	663	903
V/C Ratio(X)	0.91	0.48	0.17	0.80	0.82	0.39	0.26	0.00	0.39	0.21	0.15	0.54
Avail Cap(c_a), veh/h	552	2430	756	256	1994	493	344	0	618	364	663	903
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	4.7	4.4	40.0	29.5	25.2	23.3	0.0	21.7	27.1	19.7	12.0
Incr Delay (d2), s/veh	14.3	0.2	0.1	9.4	2.8	0.5	1.8	0.0	1.9	1.3	0.5	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	2.1	0.5	3.6	9.3	3.7	1.9	0.0	4.9	1.7	1.7	8.0
LnGrp Delay(d),s/veh	39.3	4.8	4.5	49.4	32.2	25.8	25.2	0.0	23.6	28.4	20.2	14.3
LnGrp LOS	D	A	A	D	C	C	C		C	C	C	B
Approach Vol, veh/h		1476			1873			334			664	
Approach Delay, s/veh		12.9			32.8			24.0			16.8	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	12.3	41.7		36.0	23.3	30.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		22.0	13.0	43.0		22.0	28.0	28.0
Max Q Clear Time (g_c+I1), s		12.7	8.5	6.9		19.3	18.6	22.3
Green Ext Time (p_c), s		1.3	0.1	8.2		0.8	0.7	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	859	24	6	488	24	1	2	8	36	4	4
Future Vol, veh/h	6	859	24	6	488	24	1	2	8	36	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	904	25	6	514	25	1	2	8	38	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	539	0	0	929	0	0	1470	1480	917	1469	1480	527
Stage 1	-	-	-	-	-	-	929	929	-	539	539	-
Stage 2	-	-	-	-	-	-	541	551	-	930	941	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1029	-	-	736	-	-	105	125	330	106	125	551
Stage 1	-	-	-	-	-	-	321	346	-	527	522	-
Stage 2	-	-	-	-	-	-	525	515	-	321	342	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1029	-	-	736	-	-	100	123	330	101	123	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	123	-	101	123	-
Stage 1	-	-	-	-	-	-	319	344	-	524	518	-
Stage 2	-	-	-	-	-	-	513	511	-	309	340	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	22	57.7
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	114	330	1029	-	-	736	-	-	103	551
HCM Lane V/C Ratio	0.028	0.026	0.006	-	-	0.009	-	-	0.409	0.008
HCM Control Delay (s)	37.5	16.2	8.5	-	-	9.9	-	-	62.3	11.6
HCM Lane LOS	E	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	1.7	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	482	226	21	395	130	158	150	15	196	178	93
Future Volume (veh/h)	126	482	226	21	395	130	158	150	15	196	178	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	131	502	235	22	411	135	165	156	16	204	185	97
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	175	1130	506	63	477	406	206	830	84	249	992	444
Arrive On Green	0.10	0.32	0.32	0.04	0.26	0.26	0.12	0.26	0.26	0.14	0.28	0.28
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3245	329	1774	3539	1583
Grp Volume(v), veh/h	131	502	235	22	411	135	165	84	88	204	185	97
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1805	1774	1770	1583
Q Serve(g_s), s	4.6	7.2	7.6	0.8	13.5	4.5	5.8	2.4	2.4	7.2	2.6	3.0
Cycle Q Clear(g_c), s	4.6	7.2	7.6	0.8	13.5	4.5	5.8	2.4	2.4	7.2	2.6	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	175	1130	506	63	477	406	206	453	461	249	992	444
V/C Ratio(X)	0.75	0.44	0.46	0.35	0.86	0.33	0.80	0.19	0.19	0.82	0.19	0.22
Avail Cap(c_a), veh/h	221	1130	506	193	551	468	249	453	461	304	992	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	17.3	17.5	30.3	22.8	19.4	27.7	18.7	18.7	26.8	17.6	17.7
Incr Delay (d2), s/veh	10.3	0.3	0.7	3.3	11.8	0.5	14.4	0.9	0.9	13.5	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.5	3.4	0.4	8.5	2.0	3.7	1.3	1.3	4.5	1.3	1.4
LnGrp Delay(d),s/veh	38.4	17.6	18.1	33.6	34.6	19.9	42.0	19.6	19.6	40.3	18.0	18.9
LnGrp LOS	D	B	B	C	C	B	D	B	B	D	B	B
Approach Vol, veh/h		868			568			337			486	
Approach Delay, s/veh		20.9			31.1			30.6			27.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	20.4	6.3	24.5	11.5	22.0	10.3	20.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	16.0	7.0	20.0	9.0	18.0	8.0	19.0
Max Q Clear Time (g_c+I1), s	9.2	4.4	2.8	9.6	7.8	5.0	6.6	15.5
Green Ext Time (p_c), s	0.1	0.6	0.0	2.8	0.0	1.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	11.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	124	154	0	0	97	46	277	2	24	0	0	0
Future Vol, veh/h	124	154	0	0	97	46	277	2	24	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	159	0	0	100	47	286	2	25	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	147	0	-	-	-	0	539	562	159
Stage 1	-	-	-	-	-	-	415	415	-
Stage 2	-	-	-	-	-	-	124	147	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	0	0	-	-	503	436	886
Stage 1	-	-	0	0	-	-	666	592	-
Stage 2	-	-	0	0	-	-	902	775	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1435	-	-	-	-	-	458	0	886
Mov Cap-2 Maneuver	-	-	-	-	-	-	458	0	-
Stage 1	-	-	-	-	-	-	607	0	-
Stage 2	-	-	-	-	-	-	902	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.5	0	23.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	458	886	1435	-	-	-
HCM Lane V/C Ratio	0.628	0.028	0.089	-	-	-
HCM Control Delay (s)	25.2	9.2	7.8	-	-	-
HCM Lane LOS	D	A	A	-	-	-
HCM 95th %tile Q(veh)	4.2	0.1	0.3	-	-	-

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	214	275	21	353	0	0	0	0	67	1	135
Future Vol, veh/h	0	214	275	21	353	0	0	0	0	67	1	135
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	218	281	21	360	0	0	0	0	68	1	138
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	11	15.7	10.6
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	99%	0%
Vol Thru, %	100%	0%	0%	100%	1%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	214	275	21	353	68	135
LT Vol	0	0	21	0	67	0
Through Vol	214	0	0	353	1	0
RT Vol	0	275	0	0	0	135
Lane Flow Rate	218	281	21	360	69	138
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.343	0.386	0.037	0.576	0.137	0.227
Departure Headway (Hd)	5.659	4.951	6.266	5.761	7.132	5.922
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	727	572	627	504	606
Service Time	3.385	2.676	3.994	3.488	4.866	3.656
HCM Lane V/C Ratio	0.343	0.387	0.037	0.574	0.137	0.228
HCM Control Delay	11.3	10.8	9.2	16.1	11	10.4
HCM Lane LOS	B	B	A	C	B	B
HCM 95th-tile Q	1.5	1.8	0.1	3.7	0.5	0.9

Intersection	
Int Delay, s/veh	6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	57	201	281	82	225
Future Vol, veh/h	211	57	201	281	82	225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	229	62	218	305	89	245

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	291	0	1001	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	741	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1271	-	269	779
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	471	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1271	-	223	779
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	471	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	223	779	-	-	1271	-
HCM Lane V/C Ratio	0.4	0.314	-	-	0.172	-
HCM Control Delay (s)	31.5	11.7	-	-	8.4	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.8	1.3	-	-	0.6	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	11	854	23	16	11	871	208	14	3	189	107
Future Volume (veh/h)	80	11	854	23	16	11	871	208	14	3	189	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	84	12	899	24	17	12	917	219	15	3	199	113
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	41	1149	122	82	42	955	928	64	238	250	212
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.54	0.54	0.54	0.13	0.13	0.13
Sat Flow, veh/h	1296	218	1583	323	436	222	1774	1724	118	1774	1863	1583
Grp Volume(v), veh/h	96	0	899	53	0	0	917	0	234	3	199	113
Grp Sat Flow(s),veh/h/ln	1514	0	1583	981	0	0	1774	0	1842	1774	1863	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.1	0.0	0.0	42.2	0.0	5.7	0.1	8.9	5.7
Cycle Q Clear(g_c), s	3.9	0.0	16.0	4.0	0.0	0.0	42.2	0.0	5.7	0.1	8.9	5.7
Prop In Lane	0.87		1.00	0.45		0.23	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	363	0	1149	245	0	0	955	0	992	238	250	212
V/C Ratio(X)	0.26	0.00	0.78	0.22	0.00	0.00	0.96	0.00	0.24	0.01	0.80	0.53
Avail Cap(c_a), veh/h	363	0	1149	245	0	0	955	0	992	332	349	296
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	5.4	29.1	0.0	0.0	18.9	0.0	10.4	32.1	35.9	34.5
Incr Delay (d2), s/veh	0.4	0.0	3.6	0.4	0.0	0.0	21.0	0.0	0.6	0.0	8.5	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	22.1	1.1	0.0	0.0	25.9	0.0	3.1	0.1	5.1	2.6
LnGrp Delay(d),s/veh	30.2	0.0	9.0	29.5	0.0	0.0	39.8	0.0	11.0	32.1	44.3	36.6
LnGrp LOS	C		A	C			D		B	C	D	D
Approach Vol, veh/h		995			53			1151			315	
Approach Delay, s/veh		11.0			29.5			34.0			41.4	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		15.5		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		44.2		18.0		10.9		6.0
Green Ext Time (p_c), s		1.0		0.0		0.6		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	4	46	247	2	105	45	939	25	98	918	11
Future Volume (veh/h)	18	4	46	247	2	105	45	939	25	98	918	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	4	49	263	2	112	48	999	27	104	977	12
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	57	236	445	413	351	118	1619	724	180	1764	22
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.46	0.46	0.10	0.49	0.49
Sat Flow, veh/h	242	257	1064	1346	1863	1583	1774	3539	1583	1774	3581	44
Grp Volume(v), veh/h	72	0	0	263	2	112	48	999	27	104	483	506
Grp Sat Flow(s),veh/h/ln	1563	0	0	1346	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	7.6	0.0	3.2	1.4	11.7	0.5	3.1	10.4	10.4
Cycle Q Clear(g_c), s	1.9	0.0	0.0	9.6	0.0	3.2	1.4	11.7	0.5	3.1	10.4	10.4
Prop In Lane	0.26		0.68	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	429	0	0	445	413	351	118	1619	724	180	872	914
V/C Ratio(X)	0.17	0.00	0.00	0.59	0.00	0.32	0.41	0.62	0.04	0.58	0.55	0.55
Avail Cap(c_a), veh/h	536	0	0	541	545	463	227	1619	724	227	872	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	20.1	16.6	17.8	24.5	11.2	8.2	23.4	9.7	9.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.3	0.0	0.5	2.3	1.8	0.1	2.9	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	3.9	0.0	1.5	0.8	5.9	0.2	1.6	5.6	5.8
LnGrp Delay(d),s/veh	17.5	0.0	0.0	21.3	16.6	18.3	26.8	13.0	8.3	26.3	12.2	12.1
LnGrp LOS	B			C	B	B	C	B	A	C	B	B
Approach Vol, veh/h		72			377			1074			1093	
Approach Delay, s/veh		17.5			20.4			13.5			13.5	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	29.0		16.1	7.6	30.9		16.1
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	5.1	13.7		3.9	3.4	12.4		11.6
Green Ext Time (p_c), s	0.0	4.8		0.2	0.0	4.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	692	40	126	364	985	141	33
Future Volume (veh/h)	191	353	37	257	181	692	40	126	364	985	141	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	205	380	40	276	195	744	43	135	391	1059	152	35
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	499	52	301	289	1269	96	481	547	1032	1785	798
Arrive On Green	0.09	0.15	0.15	0.03	0.05	0.05	0.05	0.26	0.26	0.30	0.50	0.50
Sat Flow, veh/h	3442	3234	339	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	205	207	213	276	195	744	43	135	391	1059	152	35
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	4.6	9.0	9.1	6.4	8.2	8.1	1.9	4.6	17.2	24.0	1.8	0.6
Cycle Q Clear(g_c), s	4.6	9.0	9.1	6.4	8.2	8.1	1.9	4.6	17.2	24.0	1.8	0.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	298	273	278	301	289	1269	96	481	547	1032	1785	798
V/C Ratio(X)	0.69	0.76	0.77	0.92	0.67	0.59	0.45	0.28	0.71	1.03	0.09	0.04
Avail Cap(c_a), veh/h	301	354	361	301	373	1393	155	481	547	1032	1785	798
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	35.5	32.4	32.4	38.6	36.0	6.9	36.7	23.7	22.7	28.0	10.3	3.9
Incr Delay (d2), s/veh	6.4	6.8	7.1	26.9	2.6	0.4	3.3	1.5	7.8	31.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.9	5.0	4.2	4.5	3.2	1.0	2.6	8.6	15.9	0.9	0.3
LnGrp Delay(d),s/veh	41.9	39.2	39.5	65.4	38.5	7.3	40.0	25.2	30.5	59.6	10.3	4.0
LnGrp LOS	D	D	D	E	D	A	D	C	C	F	B	A
Approach Vol, veh/h		625			1215			569			1246	
Approach Delay, s/veh		40.2			25.5			30.0			52.0	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	24.6	11.0	16.4	8.3	44.3	10.9	16.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	24.0	17.0	7.0	16.0	7.0	34.0	7.0	16.0
Max Q Clear Time (g_c+I1), s	26.0	19.2	8.4	11.1	3.9	3.8	6.6	10.2
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.9	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1145	560	587	1285	0	0	0	0	562	0	142
Future Volume (veh/h)	0	1145	560	587	1285	0	0	0	0	562	0	142
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1168	571	599	1311	0				618	0	97
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1327	594	670	2193	0				995	0	444
Arrive On Green	0.00	0.12	0.12	0.39	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1168	571	599	1311	0				618	0	97
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	26.0	28.7	13.0	0.0	0.0				12.1	0.0	3.8
Cycle Q Clear(g_c), s	0.0	26.0	28.7	13.0	0.0	0.0				12.1	0.0	3.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1327	594	670	2193	0				995	0	444
V/C Ratio(X)	0.00	0.88	0.96	0.89	0.60	0.00				0.62	0.00	0.22
Avail Cap(c_a), veh/h	0	1327	594	731	2256	0				995	0	444
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.47	0.47	0.58	0.58	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.3	34.5	23.7	0.0	0.0				25.1	0.0	22.1
Incr Delay (d2), s/veh	0.0	3.6	17.0	8.1	0.2	0.0				2.9	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.4	15.4	6.9	0.1	0.0				6.3	0.0	1.8
LnGrp Delay(d),s/veh	0.0	36.8	51.4	31.8	0.2	0.0				28.0	0.0	23.2
LnGrp LOS		D	D	C	A					C		C
Approach Vol, veh/h		1739			1910						715	
Approach Delay, s/veh		41.6			10.1						27.4	
Approach LOS		D			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			19.6	34.0		26.4		53.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			17.0	30.0		21.0		51.0
Max Q Clear Time (g_c+I1), s			15.0	30.7		14.1		2.0
Green Ext Time (p_c), s			0.5	0.0		1.7		14.3

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1619	0	0	1330	378	510	0	708	0	0	0
Future Volume (veh/h)	117	1619	0	0	1330	378	510	0	708	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	119	1652	0	0	1357	386	776	0	448			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	149	2229	0	0	1548	482	1638	0	731			
Arrive On Green	0.17	0.88	0.00	0.00	0.61	0.61	0.46	0.00	0.46			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	119	1652	0	0	1357	386	776	0	448			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	5.2	9.2	0.0	0.0	17.9	14.9	12.1	0.0	17.0			
Cycle Q Clear(g_c), s	5.2	9.2	0.0	0.0	17.9	14.9	12.1	0.0	17.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	149	2229	0	0	1548	482	1638	0	731			
V/C Ratio(X)	0.80	0.74	0.00	0.00	0.88	0.80	0.47	0.00	0.61			
Avail Cap(c_a), veh/h	222	2543	0	0	1653	515	1638	0	731			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.44	0.44	0.00	0.00	0.67	0.67	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.6	3.3	0.0	0.0	14.4	13.8	14.8	0.0	16.2			
Incr Delay (d2), s/veh	5.5	0.5	0.0	0.0	3.7	5.8	1.0	0.0	3.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.7	3.7	0.0	0.0	8.6	7.0	6.0	0.0	8.1			
LnGrp Delay(d),s/veh	38.1	3.8	0.0	0.0	18.1	19.6	15.8	0.0	20.0			
LnGrp LOS	D	A			B	B	B		B			
Approach Vol, veh/h		1771			1743			1224				
Approach Delay, s/veh		6.1			18.4			17.3				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		40.9		39.1			10.7	28.4
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		32.0		40.0			10.0	26.0
Max Q Clear Time (g_c+I1), s		19.0		11.2			7.2	19.9
Green Ext Time (p_c), s		4.1		13.9			0.1	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	1729	168	132	1266	74	93	106	166	58	67	348
Future Volume (veh/h)	430	1729	168	132	1266	74	93	106	166	58	67	348
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	439	1764	171	135	1292	76	95	108	169	59	68	355
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	2089	650	170	1542	381	396	225	352	325	640	965
Arrive On Green	0.53	0.82	0.82	0.10	0.24	0.24	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	960	656	1026	1098	1863	1583
Grp Volume(v), veh/h	439	1764	171	135	1292	76	95	0	277	59	68	355
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	960	0	1682	1098	1863	1583
Q Serve(g_s), s	18.3	16.2	2.0	6.0	15.3	3.1	6.0	0.0	10.4	3.6	2.0	0.0
Cycle Q Clear(g_c), s	18.3	16.2	2.0	6.0	15.3	3.1	8.0	0.0	10.4	13.9	2.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	472	2089	650	170	1542	381	396	0	577	325	640	965
V/C Ratio(X)	0.93	0.84	0.26	0.79	0.84	0.20	0.24	0.00	0.48	0.18	0.11	0.37
Avail Cap(c_a), veh/h	643	2352	732	266	1602	396	396	0	577	325	640	965
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	5.6	4.4	35.4	28.9	24.2	20.6	0.0	20.6	26.1	17.9	7.9
Incr Delay (d2), s/veh	12.7	1.9	0.1	8.5	4.0	0.3	1.4	0.0	2.8	1.2	0.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	7.2	0.8	3.3	7.2	1.4	1.7	0.0	5.2	1.2	1.1	4.1
LnGrp Delay(d),s/veh	30.7	7.6	4.5	43.9	32.9	24.5	22.0	0.0	23.5	27.3	18.2	8.9
LnGrp LOS	C	A	A	D	C	C	C		C	C	B	A
Approach Vol, veh/h		2374			1503			372			482	
Approach Delay, s/veh		11.6			33.4			23.1			12.5	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		31.5	11.7	36.9		31.5	25.3	23.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	12.0	37.0		19.0	29.0	20.0
Max Q Clear Time (g_c+I1), s		12.4	8.0	18.2		15.9	20.3	17.3
Green Ext Time (p_c), s		1.1	0.1	12.2		0.6	0.9	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	895	1	6	850	100	0	2	9	27	1	5
Future Vol, veh/h	1	895	1	6	850	100	0	2	9	27	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	984	1	7	934	110	0	2	10	30	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1044	0	0	985	0	0	1991	2045	985	1991	1990	989
Stage 1	-	-	-	-	-	-	987	987	-	1003	1003	-
Stage 2	-	-	-	-	-	-	1004	1058	-	988	987	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	666	-	-	701	-	-	45	56	301	45	61	299
Stage 1	-	-	-	-	-	-	298	325	-	292	320	-
Stage 2	-	-	-	-	-	-	291	301	-	297	325	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	666	-	-	701	-	-	43	55	301	42	60	299
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	55	-	42	60	-
Stage 1	-	-	-	-	-	-	297	324	-	291	317	-
Stage 2	-	-	-	-	-	-	282	298	-	285	324	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	27.5	180
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	55	301	666	-	-	701	-	-	42	299
HCM Lane V/C Ratio	0.04	0.033	0.002	-	-	0.009	-	-	0.733	0.018
HCM Control Delay (s)	73.2	17.4	10.4	-	-	10.2	-	-	209.1	17.3
HCM Lane LOS	F	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	2.8	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	664	284	48	531	305	210	326	18	188	261	167
Future Volume (veh/h)	159	664	284	48	531	305	210	326	18	188	261	167
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	167	699	299	51	559	321	221	343	19	198	275	176
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	201	1327	594	106	599	509	245	791	44	235	801	358
Arrive On Green	0.11	0.38	0.38	0.06	0.32	0.32	0.14	0.23	0.23	0.13	0.23	0.23
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3411	188	1774	3539	1583
Grp Volume(v), veh/h	167	699	299	51	559	321	221	177	185	198	275	176
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1830	1774	1770	1583
Q Serve(g_s), s	7.3	12.2	11.6	2.2	23.2	13.7	9.8	6.8	6.9	8.7	5.2	7.7
Cycle Q Clear(g_c), s	7.3	12.2	11.6	2.2	23.2	13.7	9.8	6.8	6.9	8.7	5.2	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	201	1327	594	106	599	509	245	410	424	235	801	358
V/C Ratio(X)	0.83	0.53	0.50	0.48	0.93	0.63	0.90	0.43	0.44	0.84	0.34	0.49
Avail Cap(c_a), veh/h	201	1327	594	156	609	517	245	410	424	245	801	358
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	19.4	19.2	36.2	26.2	23.0	33.8	26.1	26.1	33.7	25.8	26.8
Incr Delay (d2), s/veh	24.7	0.4	0.7	3.4	21.5	2.4	32.6	3.3	3.2	21.7	1.2	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	6.0	5.2	1.2	15.4	6.3	7.0	3.7	3.8	5.7	2.7	3.8
LnGrp Delay(d),s/veh	59.3	19.8	19.8	39.6	47.7	25.4	66.4	29.4	29.3	55.4	27.0	31.6
LnGrp LOS	E	B	B	D	D	C	E	C	C	E	C	C
Approach Vol, veh/h		1165			931			583			649	
Approach Delay, s/veh		25.4			39.5			43.4			36.9	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	22.4	8.7	33.8	15.0	22.0	13.0	29.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	18.0	7.0	28.0	11.0	18.0	9.0	26.0
Max Q Clear Time (g_c+I1), s	10.7	8.9	4.2	14.2	11.8	9.7	9.3	25.2
Green Ext Time (p_c), s	0.0	1.2	0.0	4.6	0.0	1.4	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	28.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Future Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	144	465	0	0	230	154	244	2	146	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	384	0	-	-	-	0	1060	1137	465
Stage 1	-	-	-	-	-	-	753	753	-
Stage 2	-	-	-	-	-	-	307	384	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1174	-	0	0	-	-	248	202	597
Stage 1	-	-	0	0	-	-	465	417	-
Stage 2	-	-	0	0	-	-	746	611	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1174	-	-	-	-	-	~ 217	0	597
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 217	0	-
Stage 1	-	-	-	-	-	-	408	0	-
Stage 2	-	-	-	-	-	-	746	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	98
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	217	597	1174	-	-	-
HCM Lane V/C Ratio	1.134	0.245	0.123	-	-	-
HCM Control Delay (s)	148.5	13	8.5	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	11.6	1	0.4	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	256	291	45	254	0	0	0	0	129	4	79
Future Vol, veh/h	0	256	291	45	254	0	0	0	0	129	4	79
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	312	355	55	310	0	0	0	0	157	5	96
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	14.2	15.3	12.6
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	256	291	45	254	133	79
LT Vol	0	0	45	0	129	0
Through Vol	256	0	0	254	4	0
RT Vol	0	291	0	0	0	79
Lane Flow Rate	312	355	55	310	162	96
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.516	0.516	0.103	0.539	0.336	0.167
Departure Headway (Hd)	5.949	5.239	6.771	6.262	7.447	6.242
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	606	685	528	576	483	573
Service Time	3.694	2.984	4.523	4.014	5.198	3.993
HCM Lane V/C Ratio	0.515	0.518	0.104	0.538	0.335	0.168
HCM Control Delay	14.9	13.5	10.3	16.2	13.9	10.3
HCM Lane LOS	B	B	B	C	B	B
HCM 95th-tile Q	3	3	0.3	3.2	1.5	0.6

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	399	32	120	203	22	111
Future Vol, veh/h	399	32	120	203	22	111
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	459	37	138	233	25	128

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	496	0	987	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	509	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1068	-	274	587
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1068	-	239	587
Mov Cap-2 Maneuver	-	-	-	-	239	-
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	604	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.3	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	239	587	-	-	1068	-
HCM Lane V/C Ratio	0.106	0.217	-	-	0.129	-
HCM Control Delay (s)	21.8	12.8	-	-	8.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.8	-	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	6	796	3	1	0	650	69	11	2	88	52
Future Volume (veh/h)	71	6	796	3	1	0	650	69	11	2	88	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	73	6	821	3	1	0	731	0	0	2	91	54
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	473	34	1101	241	66	0	1527	802	0	4	193	168
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.00	0.43	0.00	0.00	0.11	0.11	0.11
Sat Flow, veh/h	1352	130	1583	515	249	0	3548	1863	0	40	1821	1583
Grp Volume(v), veh/h	79	0	821	4	0	0	731	0	0	93	0	54
Grp Sat Flow(s),veh/h/ln	1482	0	1583	764	0	0	1774	1863	0	1861	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	8.9	0.0	0.0	2.8	0.0	1.9
Cycle Q Clear(g_c), s	2.1	0.0	16.0	2.1	0.0	0.0	8.9	0.0	0.0	2.8	0.0	1.9
Prop In Lane	0.92		1.00	0.75		0.00	1.00		0.00	0.02		1.00
Lane Grp Cap(c), veh/h	507	0	1101	307	0	0	1527	802	0	197	0	168
V/C Ratio(X)	0.16	0.00	0.75	0.01	0.00	0.00	0.48	0.00	0.00	0.47	0.00	0.32
Avail Cap(c_a), veh/h	507	0	1101	307	0	0	1527	802	0	493	0	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	5.2	16.4	0.0	0.0	12.3	0.0	0.0	25.4	0.0	25.0
Incr Delay (d2), s/veh	0.1	0.0	2.8	0.0	0.0	0.0	1.1	0.0	0.0	1.7	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	14.3	0.1	0.0	0.0	4.6	0.0	0.0	1.5	0.0	0.9
LnGrp Delay(d),s/veh	17.2	0.0	8.1	16.4	0.0	0.0	13.4	0.0	0.0	27.2	0.0	26.1
LnGrp LOS	B		A	B			B			C		C
Approach Vol, veh/h		900			4			731			147	
Approach Delay, s/veh		8.9			16.4			13.4			26.8	
Approach LOS		A			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		20.0		10.4		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		10.9		18.0		4.8		4.1
Green Ext Time (p_c), s		2.4		0.0		0.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	15	98	2	41	41	657	21	52	774	13
Future Volume (veh/h)	1	1	15	98	2	41	41	657	21	52	774	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	1	1	16	102	2	43	43	684	22	54	806	14
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	19	188	342	246	209	114	1895	848	134	1946	34
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.06	0.54	0.54	0.08	0.55	0.55
Sat Flow, veh/h	33	144	1422	1390	1863	1583	1774	3539	1583	1774	3560	62
Grp Volume(v), veh/h	18	0	0	102	2	43	43	684	22	54	401	419
Grp Sat Flow(s),veh/h/ln	1599	0	0	1390	1863	1583	1774	1770	1583	1774	1770	1852
Q Serve(g_s), s	0.0	0.0	0.0	2.6	0.0	1.1	1.1	5.2	0.3	1.4	6.2	6.2
Cycle Q Clear(g_c), s	0.5	0.0	0.0	3.1	0.0	1.1	1.1	5.2	0.3	1.4	6.2	6.2
Prop In Lane	0.06		0.89	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	293	0	0	342	246	209	114	1895	848	134	967	1012
V/C Ratio(X)	0.06	0.00	0.00	0.30	0.01	0.21	0.38	0.36	0.03	0.40	0.41	0.41
Avail Cap(c_a), veh/h	626	0	0	634	638	542	266	1895	848	266	967	1012
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	0.0	18.9	17.6	18.1	21.0	6.3	5.1	20.6	6.2	6.2
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	2.1	0.5	0.1	1.9	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.3	0.0	0.5	0.6	2.6	0.1	0.7	3.4	3.5
LnGrp Delay(d),s/veh	17.9	0.0	0.0	19.4	17.6	18.6	23.0	6.8	5.2	22.5	7.5	7.5
LnGrp LOS	B			B	B	B	C	A	A	C	A	A
Approach Vol, veh/h		18			147			749			874	
Approach Delay, s/veh		17.9			19.1			7.7			8.4	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	29.0		10.2	7.0	29.5		10.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.4	7.2		2.5	3.1	8.2		5.1
Green Ext Time (p_c), s	0.0	3.9		0.0	0.0	4.3		0.3

Intersection Summary		
HCM 2010 Ctrl Delay		9.1
HCM 2010 LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	726	40	128	364	1063	150	35
Future Volume (veh/h)	191	353	37	257	181	726	40	128	364	1063	150	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	215	397	42	289	203	816	45	144	409	1194	169	39
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	485	51	344	288	1530	187	331	440	1358	1652	739
Arrive On Green	0.10	0.15	0.15	0.03	0.05	0.05	0.11	0.18	0.18	0.39	0.47	0.47
Sat Flow, veh/h	3442	3232	340	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	215	216	223	289	203	816	45	144	409	1194	169	39
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.2	10.9	29.0	2.4	1.2
Cycle Q Clear(g_c), s	5.4	10.7	10.8	7.5	9.7	0.0	2.1	6.2	10.9	29.0	2.4	1.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	265	270	344	288	1530	187	331	440	1358	1652	739
V/C Ratio(X)	0.65	0.82	0.82	0.84	0.71	0.53	0.24	0.43	0.93	0.88	0.10	0.05
Avail Cap(c_a), veh/h	329	315	320	344	352	1626	187	331	440	1358	1652	739
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	39.3	37.0	37.1	42.8	40.7	15.3	36.9	33.0	17.6	25.3	13.4	13.1
Incr Delay (d2), s/veh	4.6	13.2	13.8	12.8	3.6	0.2	0.7	4.1	28.5	6.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	6.2	6.4	4.2	5.3	7.6	1.1	3.6	8.2	15.0	1.2	0.6
LnGrp Delay(d),s/veh	43.9	50.2	50.9	55.6	44.3	15.5	37.6	37.1	46.1	31.9	13.6	13.3
LnGrp LOS	D	D	D	E	D	B	D	D	D	C	B	B
Approach Vol, veh/h		654			1308			598			1402	
Approach Delay, s/veh		48.4			28.9			43.3			29.1	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.5	20.0	13.0	17.5	13.5	46.0	12.6	17.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	33.0	16.0	9.0	16.0	7.0	42.0	8.0	17.0
Max Q Clear Time (g_c+I1), s	31.0	12.9	9.5	12.8	4.1	4.4	7.4	11.7
Green Ext Time (p_c), s	1.1	0.7	0.0	0.7	0.0	1.1	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	609	569	661	1344	0	0	0	0	235	5	176
Future Volume (veh/h)	0	609	569	661	1344	0	0	0	0	235	5	176
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	634	593	689	1400	0				304	0	124
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1298	581	774	2251	0				976	0	435
Arrive On Green	0.00	0.12	0.12	0.45	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	634	593	689	1400	0				304	0	124
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	15.1	33.0	16.5	0.0	0.0				6.1	0.0	5.5
Cycle Q Clear(g_c), s	0.0	15.1	33.0	16.5	0.0	0.0				6.1	0.0	5.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1298	581	774	2251	0				976	0	435
V/C Ratio(X)	0.00	0.49	1.02	0.89	0.62	0.00				0.31	0.00	0.28
Avail Cap(c_a), veh/h	0	1298	581	994	2477	0				976	0	435
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.39	0.39	0.56	0.56	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.7	39.6	23.7	0.0	0.0				25.9	0.0	25.7
Incr Delay (d2), s/veh	0.0	0.1	29.0	5.0	0.2	0.0				0.8	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.4	19.1	8.2	0.1	0.0				3.1	0.0	2.6
LnGrp Delay(d),s/veh	0.0	31.8	68.5	28.7	0.2	0.0				26.7	0.0	27.3
LnGrp LOS		C	F	C	A					C		C
Approach Vol, veh/h		1227			2089						428	
Approach Delay, s/veh		49.5			9.6						26.9	
Approach LOS		D			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.2	37.0		28.8		61.2
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			26.0	33.0		19.0		63.0
Max Q Clear Time (g_c+I1), s			18.5	35.0		8.1		2.0
Green Ext Time (p_c), s			1.7	0.0		1.2		16.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	799	0	0	1508	444	539	0	553	0	0	0
Future Volume (veh/h)	60	799	0	0	1508	444	539	0	553	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	65	859	0	0	1622	477	767	0	394			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	111	2391	0	0	1847	575	1564	0	698			
Arrive On Green	0.12	0.94	0.00	0.00	0.73	0.73	0.44	0.00	0.44			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	65	859	0	0	1622	477	767	0	394			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	3.1	1.4	0.0	0.0	21.7	18.7	13.9	0.0	16.7			
Cycle Q Clear(g_c), s	3.1	1.4	0.0	0.0	21.7	18.7	13.9	0.0	16.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	111	2391	0	0	1847	575	1564	0	698			
V/C Ratio(X)	0.59	0.36	0.00	0.00	0.88	0.83	0.49	0.00	0.56			
Avail Cap(c_a), veh/h	158	2712	0	0	2034	633	1564	0	698			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.82	0.82	0.00	0.00	0.69	0.69	1.00	0.00	1.00			
Uniform Delay (d), s/veh	38.3	1.5	0.0	0.0	10.8	10.4	17.9	0.0	18.7			
Incr Delay (d2), s/veh	4.0	0.1	0.0	0.0	3.1	5.9	1.1	0.0	3.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.5	0.0	0.0	10.1	8.6	7.1	0.0	7.9			
LnGrp Delay(d),s/veh	42.3	1.5	0.0	0.0	13.9	16.3	19.0	0.0	22.0			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		924			2099			1161				
Approach Delay, s/veh		4.4			14.5			20.1				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		43.7		46.3			9.6	36.7
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		34.0		48.0			8.0	36.0
Max Q Clear Time (g_c+I1), s		18.7		3.4			5.1	23.7
Green Ext Time (p_c), s		4.1		6.4			0.0	9.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	933	104	119	1427	168	82	130	92	70	89	445
Future Volume (veh/h)	317	933	104	119	1427	168	82	130	92	70	89	445
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	348	1025	114	131	1568	185	90	143	101	77	98	489
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	2132	664	164	1902	470	344	361	255	363	662	902
Arrive On Green	0.43	0.84	0.84	0.09	0.30	0.30	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	825	1017	719	1131	1863	1583
Grp Volume(v), veh/h	348	1025	114	131	1568	185	90	0	244	77	98	489
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	825	0	1736	1131	1863	1583
Q Serve(g_s), s	16.6	4.9	1.2	6.5	20.5	8.4	7.5	0.0	9.5	4.9	3.2	17.3
Cycle Q Clear(g_c), s	16.6	4.9	1.2	6.5	20.5	8.4	10.7	0.0	9.5	14.4	3.2	17.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	381	2132	664	164	1902	470	344	0	617	363	662	902
V/C Ratio(X)	0.91	0.48	0.17	0.80	0.82	0.39	0.26	0.00	0.40	0.21	0.15	0.54
Avail Cap(c_a), veh/h	552	2430	756	256	1994	493	344	0	617	363	662	902
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	4.6	4.3	40.0	29.5	25.2	23.4	0.0	21.8	27.2	19.7	12.1
Incr Delay (d2), s/veh	14.3	0.2	0.1	9.4	2.8	0.5	1.8	0.0	1.9	1.3	0.5	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	2.1	0.5	3.6	9.4	3.7	1.9	0.0	4.9	1.7	1.7	8.0
LnGrp Delay(d),s/veh	39.2	4.8	4.4	49.4	32.3	25.7	25.2	0.0	23.7	28.5	20.2	14.4
LnGrp LOS	D	A	A	D	C	C	C		C	C	C	B
Approach Vol, veh/h		1487			1884			334			664	
Approach Delay, s/veh		12.8			32.8			24.1			16.9	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	12.3	41.7		36.0	23.3	30.7
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		22.0	13.0	43.0		22.0	28.0	28.0
Max Q Clear Time (g_c+I1), s		12.7	8.5	6.9		19.3	18.6	22.5
Green Ext Time (p_c), s		1.3	0.1	8.4		0.8	0.7	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	22.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	869	24	6	498	24	1	2	8	36	4	4
Future Vol, veh/h	6	869	24	6	498	24	1	2	8	36	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	915	25	6	524	25	1	2	8	38	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	549	0	0	940	0	0	1491	1501	928	1490	1501	537
Stage 1	-	-	-	-	-	-	940	940	-	549	549	-
Stage 2	-	-	-	-	-	-	551	561	-	941	952	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1021	-	-	729	-	-	102	122	325	102	122	544
Stage 1	-	-	-	-	-	-	316	342	-	520	516	-
Stage 2	-	-	-	-	-	-	519	510	-	316	338	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1021	-	-	729	-	-	97	120	325	97	120	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	97	120	-	97	120	-
Stage 1	-	-	-	-	-	-	314	340	-	517	512	-
Stage 2	-	-	-	-	-	-	507	506	-	304	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	22.4	61
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	111	325	1021	-	-	729	-	-	99	544
HCM Lane V/C Ratio	0.028	0.026	0.006	-	-	0.009	-	-	0.425	0.008
HCM Control Delay (s)	38.4	16.4	8.5	-	-	10	-	-	65.9	11.7
HCM Lane LOS	E	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	1.8	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	487	226	24	399	132	158	150	18	198	178	93
Future Volume (veh/h)	126	487	226	24	399	132	158	150	18	198	178	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	131	507	235	25	416	138	165	156	19	206	185	97
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	1123	502	70	481	409	206	807	97	251	988	442
Arrive On Green	0.10	0.32	0.32	0.04	0.26	0.26	0.12	0.25	0.25	0.14	0.28	0.28
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3183	382	1774	3539	1583
Grp Volume(v), veh/h	131	507	235	25	416	138	165	86	89	206	185	97
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1795	1774	1770	1583
Q Serve(g_s), s	4.6	7.4	7.7	0.9	13.7	4.6	5.8	2.5	2.5	7.3	2.6	3.0
Cycle Q Clear(g_c), s	4.6	7.4	7.7	0.9	13.7	4.6	5.8	2.5	2.5	7.3	2.6	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	174	1123	502	70	481	409	206	449	455	251	988	442
V/C Ratio(X)	0.75	0.45	0.47	0.36	0.86	0.34	0.80	0.19	0.20	0.82	0.19	0.22
Avail Cap(c_a), veh/h	220	1123	502	193	549	467	248	449	455	303	988	442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	17.5	17.6	30.2	22.8	19.4	27.8	18.9	18.9	26.9	17.7	17.8
Incr Delay (d2), s/veh	10.5	0.3	0.7	3.1	12.3	0.5	14.5	0.9	1.0	13.9	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.6	3.4	0.5	8.7	2.0	3.7	1.3	1.4	4.5	1.3	1.4
LnGrp Delay(d),s/veh	38.8	17.8	18.3	33.3	35.2	19.9	42.3	19.8	19.9	40.8	18.1	19.0
LnGrp LOS	D	B	B	C	D	B	D	B	B	D	B	B
Approach Vol, veh/h		873			579			340			488	
Approach Delay, s/veh		21.1			31.4			30.7			27.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	20.3	6.5	24.5	11.5	22.0	10.3	20.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	16.0	7.0	20.0	9.0	18.0	8.0	19.0
Max Q Clear Time (g_c+I1), s	9.3	4.5	2.9	9.7	7.8	5.0	6.6	15.7
Green Ext Time (p_c), s	0.1	0.6	0.0	2.8	0.0	1.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	26.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	13

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	146	154	0	0	97	46	277	2	24	0	0	0
Future Vol, veh/h	146	154	0	0	97	46	277	2	24	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	151	159	0	0	100	47	286	2	25	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	147	0	-	-	-	0	585	608	159
Stage 1	-	-	-	-	-	-	461	461	-
Stage 2	-	-	-	-	-	-	124	147	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	0	0	-	-	473	410	886
Stage 1	-	-	0	0	-	-	635	565	-
Stage 2	-	-	0	0	-	-	902	775	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1435	-	-	-	-	-	423	0	886
Mov Cap-2 Maneuver	-	-	-	-	-	-	423	0	-
Stage 1	-	-	-	-	-	-	568	0	-
Stage 2	-	-	-	-	-	-	902	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.8	0	28.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	423	886	1435	-	-	-
HCM Lane V/C Ratio	0.68	0.028	0.105	-	-	-
HCM Control Delay (s)	29.8	9.2	7.8	-	-	-
HCM Lane LOS	D	A	A	-	-	-
HCM 95th %tile Q(veh)	4.9	0.1	0.4	-	-	-

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	236	275	21	353	0	0	0	0	67	1	158
Future Vol, veh/h	0	236	275	21	353	0	0	0	0	67	1	158
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	241	281	21	360	0	0	0	0	68	1	161
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	11.5	16.3	11
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	99%	0%
Vol Thru, %	100%	0%	0%	100%	1%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	236	275	21	353	68	158
LT Vol	0	0	21	0	67	0
Through Vol	236	0	0	353	1	0
RT Vol	0	275	0	0	0	158
Lane Flow Rate	241	281	21	360	69	161
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.385	0.393	0.038	0.589	0.139	0.268
Departure Headway (Hd)	5.755	5.046	6.389	5.883	7.201	5.991
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	626	713	561	612	498	600
Service Time	3.487	2.778	4.123	3.617	4.941	3.73
HCM Lane V/C Ratio	0.385	0.394	0.037	0.588	0.139	0.268
HCM Control Delay	12.1	11	9.4	16.7	11.1	10.9
HCM Lane LOS	B	B	A	C	B	B
HCM 95th-tile Q	1.8	1.9	0.1	3.8	0.5	1.1

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	57	224	281	82	247
Future Vol, veh/h	211	57	224	281	82	247
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	229	62	243	305	89	268

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	291	0	1051	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	791	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1271	-	251	779
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	447	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1271	-	203	779
Mov Cap-2 Maneuver	-	-	-	-	203	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	447	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	203	779	-	-	1271	-
HCM Lane V/C Ratio	0.439	0.345	-	-	0.192	-
HCM Control Delay (s)	35.9	12	-	-	8.5	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	2.1	1.5	-	-	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	11	854	23	16	11	902	218	14	3	229	107
Future Volume (veh/h)	91	11	854	23	16	11	902	218	14	3	229	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	96	12	899	24	17	12	596	722	15	3	241	113
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	302	33	1120	109	73	36	931	955	20	4	286	246
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.53	0.53	0.53	0.16	0.16	0.16
Sat Flow, veh/h	1229	183	1583	269	398	195	1774	1818	38	23	1839	1583
Grp Volume(v), veh/h	108	0	899	53	0	0	596	0	737	244	0	113
Grp Sat Flow(s),veh/h/ln	1411	0	1583	861	0	0	1774	0	1856	1862	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.2	0.0	0.0	21.1	0.0	27.4	11.2	0.0	5.7
Cycle Q Clear(g_c), s	6.0	0.0	16.0	6.2	0.0	0.0	21.1	0.0	27.4	11.2	0.0	5.7
Prop In Lane	0.89		1.00	0.45		0.23	1.00		0.02	0.01		1.00
Lane Grp Cap(c), veh/h	335	0	1120	217	0	0	931	0	975	289	0	246
V/C Ratio(X)	0.32	0.00	0.80	0.24	0.00	0.00	0.64	0.00	0.76	0.84	0.00	0.46
Avail Cap(c_a), veh/h	335	0	1120	217	0	0	931	0	975	340	0	289
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.7	0.0	6.1	30.2	0.0	0.0	14.9	0.0	16.4	36.0	0.0	33.7
Incr Delay (d2), s/veh	0.6	0.0	4.3	0.6	0.0	0.0	3.4	0.0	5.5	15.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	22.8	1.1	0.0	0.0	11.1	0.0	15.4	7.0	0.0	2.6
LnGrp Delay(d),s/veh	32.2	0.0	10.4	30.8	0.0	0.0	18.2	0.0	21.8	51.3	0.0	35.0
LnGrp LOS	C		B	C			B		C	D		C
Approach Vol, veh/h		1007			53			1333			357	
Approach Delay, s/veh		12.7			30.8			20.2			46.2	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		17.6		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		29.4		18.0		13.2		8.2
Green Ext Time (p_c), s		6.1		0.0		0.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	21.1
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	4	46	247	2	105	45	980	26	98	958	11
Future Volume (veh/h)	18	4	46	247	2	105	45	980	26	98	958	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	4	49	263	2	112	48	1043	28	104	1019	12
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	57	236	445	413	351	118	1619	724	180	1765	21
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.46	0.46	0.10	0.49	0.49
Sat Flow, veh/h	242	257	1064	1346	1863	1583	1774	3539	1583	1774	3583	42
Grp Volume(v), veh/h	72	0	0	263	2	112	48	1043	28	104	503	528
Grp Sat Flow(s),veh/h/ln	1563	0	0	1346	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	7.6	0.0	3.2	1.4	12.4	0.5	3.1	11.0	11.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	9.6	0.0	3.2	1.4	12.4	0.5	3.1	11.0	11.0
Prop In Lane	0.26		0.68	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	429	0	0	445	413	351	118	1619	724	180	872	914
V/C Ratio(X)	0.17	0.00	0.00	0.59	0.00	0.32	0.41	0.64	0.04	0.58	0.58	0.58
Avail Cap(c_a), veh/h	536	0	0	541	545	463	227	1619	724	227	872	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	20.1	16.6	17.8	24.5	11.4	8.2	23.4	9.8	9.8
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.3	0.0	0.5	2.3	2.0	0.1	2.9	2.8	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	3.9	0.0	1.5	0.8	6.4	0.3	1.6	6.0	6.2
LnGrp Delay(d),s/veh	17.5	0.0	0.0	21.3	16.6	18.3	26.8	13.4	8.3	26.3	12.6	12.5
LnGrp LOS	B			C	B	B	C	B	A	C	B	B
Approach Vol, veh/h		72			377			1119			1135	
Approach Delay, s/veh		17.5			20.4			13.8			13.8	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	29.0		16.1	7.6	30.9		16.1
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	5.1	14.4		3.9	3.4	13.0		11.6
Green Ext Time (p_c), s	0.0	4.8		0.2	0.0	4.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	353	37	257	181	731	40	128	364	1023	143	33
Future Volume (veh/h)	191	353	37	257	181	731	40	128	364	1023	143	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	205	380	40	276	195	786	43	138	391	1100	154	35
Adj No. of Lanes	2	2	0	2	1	2	1	1	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	512	54	301	297	1280	96	474	541	1032	1771	792
Arrive On Green	0.09	0.16	0.16	0.03	0.05	0.05	0.05	0.25	0.25	0.30	0.50	0.50
Sat Flow, veh/h	3442	3234	339	3442	1863	2787	1774	1863	1583	3442	3539	1583
Grp Volume(v), veh/h	205	207	213	276	195	786	43	138	391	1100	154	35
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1863	1583	1721	1770	1583
Q Serve(g_s), s	4.6	8.9	9.0	6.4	8.2	8.5	1.9	4.8	17.3	24.0	1.8	0.6
Cycle Q Clear(g_c), s	4.6	8.9	9.0	6.4	8.2	8.5	1.9	4.8	17.3	24.0	1.8	0.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	298	280	285	301	297	1280	96	474	541	1032	1771	792
V/C Ratio(X)	0.69	0.74	0.75	0.92	0.66	0.61	0.45	0.29	0.72	1.07	0.09	0.04
Avail Cap(c_a), veh/h	301	354	361	301	373	1393	155	474	541	1032	1771	792
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00	0.77	0.77	0.77
Uniform Delay (d), s/veh	35.5	32.1	32.1	38.6	35.8	6.9	36.7	24.0	23.0	28.0	10.4	4.0
Incr Delay (d2), s/veh	6.4	6.0	6.3	26.5	2.3	0.6	3.3	1.6	8.1	44.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.8	5.0	4.2	4.4	3.4	1.0	2.7	8.7	17.6	0.9	0.3
LnGrp Delay(d),s/veh	41.9	38.1	38.5	65.0	38.1	7.4	40.0	25.6	31.2	72.0	10.5	4.1
LnGrp LOS	D	D	D	E	D	A	D	C	C	F	B	A
Approach Vol, veh/h		625			1257			572			1289	
Approach Delay, s/veh		39.5			24.8			30.5			62.8	
Approach LOS		D			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	24.3	11.0	16.7	8.3	44.0	10.9	16.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	24.0	17.0	7.0	16.0	7.0	34.0	7.0	16.0
Max Q Clear Time (g_c+I1), s	26.0	19.3	8.4	11.0	3.9	3.8	6.6	10.5
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	41.2
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1156	587	587	1324	0	0	0	0	562	0	142
Future Volume (veh/h)	0	1156	587	587	1324	0	0	0	0	562	0	142
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1180	599	599	1351	0				618	0	97
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1327	594	670	2193	0				995	0	444
Arrive On Green	0.00	0.12	0.12	0.39	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1180	599	599	1351	0				618	0	97
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	26.3	30.0	13.0	0.0	0.0				12.1	0.0	3.8
Cycle Q Clear(g_c), s	0.0	26.3	30.0	13.0	0.0	0.0				12.1	0.0	3.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1327	594	670	2193	0				995	0	444
V/C Ratio(X)	0.00	0.89	1.01	0.89	0.62	0.00				0.62	0.00	0.22
Avail Cap(c_a), veh/h	0	1327	594	731	2256	0				995	0	444
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.43	0.43	0.57	0.57	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.4	35.0	23.7	0.0	0.0				25.1	0.0	22.1
Incr Delay (d2), s/veh	0.0	3.6	26.3	8.0	0.3	0.0				2.9	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.6	17.5	6.9	0.1	0.0				6.3	0.0	1.8
LnGrp Delay(d),s/veh	0.0	37.0	61.4	31.7	0.3	0.0				28.0	0.0	23.2
LnGrp LOS		D	F	C	A					C		C
Approach Vol, veh/h		1779			1950						715	
Approach Delay, s/veh		45.2			9.9						27.4	
Approach LOS		D			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			19.6	34.0		26.4		53.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			17.0	30.0		21.0		51.0
Max Q Clear Time (g_c+I1), s			15.0	32.0		14.1		2.0
Green Ext Time (p_c), s			0.5	0.0		1.7		15.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.8
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1630	0	0	1341	378	538	0	708	0	0	0
Future Volume (veh/h)	117	1630	0	0	1341	378	538	0	708	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	119	1663	0	0	1368	386	801	0	452			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	149	2235	0	0	1554	484	1634	0	729			
Arrive On Green	0.17	0.88	0.00	0.00	0.61	0.61	0.46	0.00	0.46			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	119	1663	0	0	1368	386	801	0	452			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	5.2	9.1	0.0	0.0	18.1	14.8	12.6	0.0	17.2			
Cycle Q Clear(g_c), s	5.2	9.1	0.0	0.0	18.1	14.8	12.6	0.0	17.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	149	2235	0	0	1554	484	1634	0	729			
V/C Ratio(X)	0.80	0.74	0.00	0.00	0.88	0.80	0.49	0.00	0.62			
Avail Cap(c_a), veh/h	222	2543	0	0	1653	515	1634	0	729			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.43	0.43	0.00	0.00	0.67	0.67	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.6	3.3	0.0	0.0	14.3	13.7	15.0	0.0	16.3			
Incr Delay (d2), s/veh	5.3	0.5	0.0	0.0	3.9	5.6	1.1	0.0	3.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.7	3.8	0.0	0.0	8.7	7.0	6.4	0.0	8.3			
LnGrp Delay(d),s/veh	38.0	3.7	0.0	0.0	18.2	19.3	16.1	0.0	20.2			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		1782			1754			1253				
Approach Delay, s/veh		6.0			18.4			17.6				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		40.8		39.2			10.7	28.5
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		32.0		40.0			10.0	26.0
Max Q Clear Time (g_c+I1), s		19.2		11.1			7.2	20.1
Green Ext Time (p_c), s		4.2		14.0			0.1	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.6
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	1740	168	132	1277	74	93	106	166	58	67	348
Future Volume (veh/h)	430	1740	168	132	1277	74	93	106	166	58	67	348
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	439	1776	171	135	1303	76	95	108	169	59	68	355
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	2093	652	170	1547	382	395	225	352	324	638	964
Arrive On Green	0.53	0.82	0.82	0.10	0.24	0.24	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	960	656	1026	1098	1863	1583
Grp Volume(v), veh/h	439	1776	171	135	1303	76	95	0	277	59	68	355
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	960	0	1682	1098	1863	1583
Q Serve(g_s), s	18.3	16.4	1.9	6.0	15.5	3.1	6.0	0.0	10.4	3.6	2.0	0.0
Cycle Q Clear(g_c), s	18.3	16.4	1.9	6.0	15.5	3.1	8.0	0.0	10.4	13.9	2.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	472	2093	652	170	1547	382	395	0	576	324	638	964
V/C Ratio(X)	0.93	0.85	0.26	0.79	0.84	0.20	0.24	0.00	0.48	0.18	0.11	0.37
Avail Cap(c_a), veh/h	643	2352	732	266	1602	396	395	0	576	324	638	964
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	5.6	4.3	35.4	28.9	24.2	20.7	0.0	20.7	26.2	17.9	7.9
Incr Delay (d2), s/veh	12.5	2.0	0.1	8.5	4.2	0.3	1.4	0.0	2.9	1.2	0.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	7.3	0.8	3.3	7.2	1.4	1.7	0.0	5.2	1.2	1.1	4.1
LnGrp Delay(d),s/veh	30.6	7.6	4.5	43.9	33.1	24.4	22.1	0.0	23.5	27.4	18.3	9.0
LnGrp LOS	C	A	A	D	C	C	C		C	C	B	A
Approach Vol, veh/h		2386			1514			372			482	
Approach Delay, s/veh		11.6			33.6			23.2			12.6	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		31.4	11.7	36.9		31.4	25.3	23.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	12.0	37.0		19.0	29.0	20.0
Max Q Clear Time (g_c+I1), s		12.4	8.0	18.4		15.9	20.3	17.5
Green Ext Time (p_c), s		1.1	0.1	12.2		0.6	0.9	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	906	1	6	861	100	0	2	9	27	1	5
Future Vol, veh/h	1	906	1	6	861	100	0	2	9	27	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	996	1	7	946	110	0	2	10	30	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1056	0	0	997	0	0	2015	2069	997	2015	2014	1001
Stage 1	-	-	-	-	-	-	999	999	-	1015	1015	-
Stage 2	-	-	-	-	-	-	1016	1070	-	1000	999	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	659	-	-	694	-	-	44	54	296	44	59	295
Stage 1	-	-	-	-	-	-	293	321	-	287	316	-
Stage 2	-	-	-	-	-	-	287	298	-	293	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	659	-	-	694	-	-	42	53	296	41	58	295
Mov Cap-2 Maneuver	-	-	-	-	-	-	42	53	-	41	58	-
Stage 1	-	-	-	-	-	-	292	320	-	286	313	-
Stage 2	-	-	-	-	-	-	278	295	-	281	320	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	28.2	187.4
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	53	296	659	-	-	694	-	-	41	295
HCM Lane V/C Ratio	0.041	0.033	0.002	-	-	0.01	-	-	0.75	0.019
HCM Control Delay (s)	75.8	17.6	10.5	-	-	10.2	-	-	217.8	17.4
HCM Lane LOS	F	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	2.8	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	669	284	52	536	307	210	326	22	190	261	167
Future Volume (veh/h)	159	669	284	52	536	307	210	326	22	190	261	167
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	167	704	299	55	564	323	221	343	23	200	275	176
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	1323	592	110	601	511	245	775	52	237	799	357
Arrive On Green	0.11	0.37	0.37	0.06	0.32	0.32	0.14	0.23	0.23	0.13	0.23	0.23
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3368	225	1774	3539	1583
Grp Volume(v), veh/h	167	704	299	55	564	323	221	180	186	200	275	176
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1823	1774	1770	1583
Q Serve(g_s), s	7.4	12.4	11.6	2.4	23.5	13.8	9.8	6.9	7.0	8.8	5.2	7.7
Cycle Q Clear(g_c), s	7.4	12.4	11.6	2.4	23.5	13.8	9.8	6.9	7.0	8.8	5.2	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	200	1323	592	110	601	511	245	407	419	237	799	357
V/C Ratio(X)	0.83	0.53	0.51	0.50	0.94	0.63	0.90	0.44	0.44	0.84	0.34	0.49
Avail Cap(c_a), veh/h	200	1323	592	156	607	516	245	407	419	245	799	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	19.5	19.3	36.2	26.2	23.0	33.8	26.3	26.3	33.7	25.9	26.9
Incr Delay (d2), s/veh	25.0	0.4	0.7	3.5	22.4	2.5	33.0	3.4	3.4	22.2	1.2	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	6.1	5.2	1.3	15.8	6.4	7.0	3.8	3.9	5.7	2.7	3.8
LnGrp Delay(d),s/veh	59.6	19.9	20.0	39.7	48.6	25.4	66.9	29.7	29.7	55.9	27.1	31.7
LnGrp LOS	E	B	B	D	D	C	E	C	C	E	C	C
Approach Vol, veh/h		1170			942			587			651	
Approach Delay, s/veh		25.6			40.1			43.7			37.2	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	22.3	8.9	33.8	15.0	22.0	13.0	29.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	18.0	7.0	28.0	11.0	18.0	9.0	26.0
Max Q Clear Time (g_c+I1), s	10.8	9.0	4.4	14.4	11.8	9.7	9.4	25.5
Green Ext Time (p_c), s	0.0	1.2	0.0	4.6	0.0	1.4	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.1
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	43.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Future Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	494	0	0	244	163	260	3	156	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	407	0	-	-	-	0	1124	1205	494
Stage 1	-	-	-	-	-	-	798	798	-
Stage 2	-	-	-	-	-	-	326	407	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1152	-	0	0	-	-	~ 227	184	575
Stage 1	-	-	0	0	-	-	443	398	-
Stage 2	-	-	0	0	-	-	731	597	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1152	-	-	-	-	-	~ 197	0	575
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 197	0	-
Stage 1	-	-	-	-	-	-	385	0	-
Stage 2	-	-	-	-	-	-	731	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	148.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	197	575	1152	-	-	-
HCM Lane V/C Ratio	1.338	0.271	0.132	-	-	-
HCM Control Delay (s)	228.7	13.6	8.6	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	14.9	1.1	0.5	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	271	309	48	270	0	0	0	0	137	5	83
Future Vol, veh/h	0	271	309	48	270	0	0	0	0	137	5	83
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	330	377	59	329	0	0	0	0	167	6	101
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	15.5	16.8	13.2
HCM LOS	C	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	96%	0%
Vol Thru, %	100%	0%	0%	100%	4%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	271	309	48	270	142	83
LT Vol	0	0	48	0	137	0
Through Vol	271	0	0	270	5	0
RT Vol	0	309	0	0	0	83
Lane Flow Rate	330	377	59	329	173	101
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.557	0.561	0.112	0.586	0.365	0.179
Departure Headway (Hd)	6.069	5.358	6.912	6.403	7.585	6.382
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	592	671	517	563	473	561
Service Time	3.821	3.11	4.672	4.163	5.345	4.14
HCM Lane V/C Ratio	0.557	0.562	0.114	0.584	0.366	0.18
HCM Control Delay	16.2	14.8	10.5	17.9	14.7	10.5
HCM Lane LOS	C	B	B	C	B	B
HCM 95th-tile Q	3.4	3.5	0.4	3.8	1.7	0.6

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	423	34	126	216	24	117
Future Vol, veh/h	423	34	126	216	24	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	486	39	145	248	28	134

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	525	0	1044	506
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	538	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1042	-	254	566
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1042	-	219	566
Mov Cap-2 Maneuver	-	-	-	-	219	-
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	585	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.3	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	219	566	-	-	1042	-
HCM Lane V/C Ratio	0.126	0.238	-	-	0.139	-
HCM Control Delay (s)	23.8	13.3	-	-	9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.9	-	-	0.5	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	7	844	4	2	0	688	73	12	3	92	56
Future Volume (veh/h)	75	7	844	4	2	0	688	73	12	3	92	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	77	7	870	4	2	0	774	0	0	3	95	58
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	469	38	1099	222	92	0	1525	801	0	6	193	170
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.00	0.43	0.00	0.00	0.11	0.11	0.11
Sat Flow, veh/h	1343	143	1583	465	349	0	3548	1863	0	57	1803	1583
Grp Volume(v), veh/h	84	0	870	6	0	0	774	0	0	98	0	58
Grp Sat Flow(s),veh/h/ln	1487	0	1583	814	0	0	1774	1863	0	1860	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	9.6	0.0	0.0	3.0	0.0	2.1
Cycle Q Clear(g_c), s	2.2	0.0	16.0	2.2	0.0	0.0	9.6	0.0	0.0	3.0	0.0	2.1
Prop In Lane	0.92		1.00	0.67		0.00	1.00		0.00	0.03		1.00
Lane Grp Cap(c), veh/h	507	0	1099	314	0	0	1525	801	0	200	0	170
V/C Ratio(X)	0.17	0.00	0.79	0.02	0.00	0.00	0.51	0.00	0.00	0.49	0.00	0.34
Avail Cap(c_a), veh/h	507	0	1099	314	0	0	1525	801	0	492	0	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	5.3	16.4	0.0	0.0	12.6	0.0	0.0	25.4	0.0	25.0
Incr Delay (d2), s/veh	0.2	0.0	4.0	0.0	0.0	0.0	1.2	0.0	0.0	1.9	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	15.5	0.1	0.0	0.0	4.9	0.0	0.0	1.6	0.0	1.0
LnGrp Delay(d),s/veh	17.3	0.0	9.3	16.5	0.0	0.0	13.8	0.0	0.0	27.3	0.0	26.2
LnGrp LOS	B		A	B			B			C		C
Approach Vol, veh/h		954			6			774			156	
Approach Delay, s/veh		10.0			16.5			13.8			26.9	
Approach LOS		A			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		20.0		10.5		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		11.6		18.0		5.0		4.2
Green Ext Time (p_c), s		2.5		0.0		0.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2	15	103	3	44	44	694	23	56	819	14
Future Volume (veh/h)	2	2	15	103	3	44	44	694	23	56	819	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	2	2	16	107	3	46	46	723	24	58	853	15
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	35	173	343	249	212	119	1882	842	140	1934	34
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.07	0.53	0.53	0.08	0.54	0.54
Sat Flow, veh/h	63	259	1289	1389	1863	1583	1774	3539	1583	1774	3559	63
Grp Volume(v), veh/h	20	0	0	107	3	46	46	723	24	58	424	444
Grp Sat Flow(s),veh/h/ln	1611	0	0	1389	1863	1583	1774	1770	1583	1774	1770	1852
Q Serve(g_s), s	0.0	0.0	0.0	2.7	0.1	1.2	1.2	5.7	0.3	1.5	6.8	6.8
Cycle Q Clear(g_c), s	0.5	0.0	0.0	3.2	0.1	1.2	1.2	5.7	0.3	1.5	6.8	6.8
Prop In Lane	0.10		0.80	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	300	0	0	343	249	212	119	1882	842	140	962	1007
V/C Ratio(X)	0.07	0.00	0.00	0.31	0.01	0.22	0.39	0.38	0.03	0.41	0.44	0.44
Avail Cap(c_a), veh/h	626	0	0	630	634	539	264	1882	842	264	962	1007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	0.0	19.0	17.7	18.2	21.0	6.5	5.2	20.6	6.4	6.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	2.0	0.6	0.1	1.9	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.3	0.0	0.6	0.6	2.9	0.2	0.8	3.6	3.7
LnGrp Delay(d),s/veh	17.9	0.0	0.0	19.5	17.7	18.7	23.0	7.1	5.3	22.5	7.9	7.8
LnGrp LOS	B			B	B	B	C	A	A	C	A	A
Approach Vol, veh/h		20			156			793			926	
Approach Delay, s/veh		17.9			19.2			7.9			8.8	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	29.0		10.3	7.2	29.6		10.3
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	7.7		2.5	3.2	8.8		5.2
Green Ext Time (p_c), s	0.0	4.1		0.0	0.0	4.5		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	368	39	268	189	754	42	134	379	1104	156	36
Future Volume (veh/h)	199	368	39	268	189	754	42	134	379	1104	156	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	224	413	44	301	212	847	47	151	426	1240	175	40
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	499	53	344	296	1529	180	629	774	1343	1652	739
Arrive On Green	0.10	0.15	0.15	0.03	0.05	0.05	0.10	0.18	0.18	0.39	0.47	0.47
Sat Flow, veh/h	3442	3230	342	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	224	225	232	301	212	847	47	151	426	1240	175	40
Grp Sat Flow(s),veh/h/ln	1721	1770	1802	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	5.7	11.1	11.2	7.8	10.1	0.0	2.2	3.3	3.2	30.9	2.5	1.2
Cycle Q Clear(g_c), s	5.7	11.1	11.2	7.8	10.1	0.0	2.2	3.3	3.2	30.9	2.5	1.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	273	278	344	296	1529	180	629	774	1343	1652	739
V/C Ratio(X)	0.68	0.83	0.83	0.87	0.72	0.55	0.26	0.24	0.55	0.92	0.11	0.05
Avail Cap(c_a), veh/h	329	315	320	344	352	1613	180	629	774	1343	1652	739
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.72	1.00	1.00	1.00	0.93	0.93	0.93
Uniform Delay (d), s/veh	39.4	36.9	36.9	43.0	40.7	15.7	37.3	31.8	12.1	26.2	13.5	13.1
Incr Delay (d2), s/veh	5.6	14.6	15.2	16.3	4.0	0.3	0.8	0.9	2.8	10.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	6.6	6.8	4.5	5.5	8.0	1.1	1.7	3.0	16.5	1.2	0.6
LnGrp Delay(d),s/veh	45.0	51.4	52.1	59.3	44.7	16.0	38.1	32.7	14.9	36.4	13.6	13.3
LnGrp LOS	D	D	D	E	D	B	D	C	B	D	B	B
Approach Vol, veh/h		681			1360			624			1455	
Approach Delay, s/veh		49.5			30.0			21.0			33.0	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.1	20.0	13.0	17.9	13.1	46.0	12.6	18.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	33.0	16.0	9.0	16.0	7.0	42.0	8.0	17.0
Max Q Clear Time (g_c+I1), s	32.9	5.3	9.8	13.2	4.2	4.5	7.7	12.1
Green Ext Time (p_c), s	0.1	1.9	0.0	0.7	0.0	1.1	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	645	602	701	1423	0	0	0	0	250	6	187
Future Volume (veh/h)	0	645	602	701	1423	0	0	0	0	250	6	187
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	672	627	730	1482	0				323	0	132
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1298	581	811	2289	0				938	0	419
Arrive On Green	0.00	0.12	0.12	0.47	1.00	0.00				0.26	0.00	0.26
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	672	627	730	1482	0				323	0	132
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	16.0	33.0	17.5	0.0	0.0				6.6	0.0	6.0
Cycle Q Clear(g_c), s	0.0	16.0	33.0	17.5	0.0	0.0				6.6	0.0	6.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1298	581	811	2289	0				938	0	419
V/C Ratio(X)	0.00	0.52	1.08	0.90	0.65	0.00				0.34	0.00	0.32
Avail Cap(c_a), veh/h	0	1298	581	994	2477	0				938	0	419
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.44	0.44	0.50	0.50	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.1	39.6	22.8	0.0	0.0				26.8	0.0	26.6
Incr Delay (d2), s/veh	0.0	0.2	49.4	5.2	0.3	0.0				1.0	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.9	22.4	8.7	0.1	0.0				3.4	0.0	2.9
LnGrp Delay(d),s/veh	0.0	32.3	88.9	28.0	0.3	0.0				27.8	0.0	28.5
LnGrp LOS		C	F	C	A					C		C
Approach Vol, veh/h		1299			2212						455	
Approach Delay, s/veh		59.6			9.4						28.0	
Approach LOS		E			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			25.2	37.0		27.8		62.2
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			26.0	33.0		19.0		63.0
Max Q Clear Time (g_c+I1), s			19.5	35.0		8.6		2.0
Green Ext Time (p_c), s			1.7	0.0		1.2		18.6

Intersection Summary	
HCM 2010 Ctrl Delay	28.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	847	0	0	1598	471	570	0	587	0	0	0
Future Volume (veh/h)	64	847	0	0	1598	471	570	0	587	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	69	911	0	0	1718	506	812	0	418			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	113	2457	0	0	1906	593	1518	0	678			
Arrive On Green	0.13	0.97	0.00	0.00	0.75	0.75	0.43	0.00	0.43			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	69	911	0	0	1718	506	812	0	418			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	3.3	0.8	0.0	0.0	23.5	20.0	15.3	0.0	18.5			
Cycle Q Clear(g_c), s	3.3	0.8	0.0	0.0	23.5	20.0	15.3	0.0	18.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	113	2457	0	0	1906	593	1518	0	678			
V/C Ratio(X)	0.61	0.37	0.00	0.00	0.90	0.85	0.53	0.00	0.62			
Avail Cap(c_a), veh/h	158	2712	0	0	2034	633	1518	0	678			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.81	0.81	0.00	0.00	0.64	0.64	1.00	0.00	1.00			
Uniform Delay (d), s/veh	38.2	0.8	0.0	0.0	10.0	9.5	19.1	0.0	20.0			
Incr Delay (d2), s/veh	4.2	0.1	0.0	0.0	3.8	6.9	1.4	0.0	4.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.7	0.3	0.0	0.0	10.8	9.3	7.7	0.0	8.8			
LnGrp Delay(d),s/veh	42.4	0.9	0.0	0.0	13.8	16.5	20.4	0.0	24.2			
LnGrp LOS	D	A			B	B	C		C			
Approach Vol, veh/h		980			2224			1230				
Approach Delay, s/veh		3.8			14.4			21.7				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		42.5		47.5			9.8	37.7
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		34.0		48.0			8.0	36.0
Max Q Clear Time (g_c+I1), s		20.5		2.8			5.3	25.5
Green Ext Time (p_c), s		4.2		6.9			0.0	8.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	989	111	127	1513	179	87	138	98	75	95	472
Future Volume (veh/h)	337	989	111	127	1513	179	87	138	98	75	95	472
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	370	1087	122	140	1663	197	96	152	108	82	104	519
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	401	2194	683	173	1942	480	318	342	243	326	629	892
Arrive On Green	0.45	0.86	0.86	0.10	0.30	0.30	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	798	1015	721	1115	1863	1583
Grp Volume(v), veh/h	370	1087	122	140	1663	197	96	0	260	82	104	519
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	798	0	1736	1115	1863	1583
Q Serve(g_s), s	17.6	4.6	1.1	7.0	22.0	8.9	8.6	0.0	10.5	5.6	3.5	19.1
Cycle Q Clear(g_c), s	17.6	4.6	1.1	7.0	22.0	8.9	12.2	0.0	10.5	16.1	3.5	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	401	2194	683	173	1942	480	318	0	586	326	629	892
V/C Ratio(X)	0.92	0.50	0.18	0.81	0.86	0.41	0.30	0.00	0.44	0.25	0.17	0.58
Avail Cap(c_a), veh/h	552	2430	756	256	1994	493	318	0	586	326	629	892
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	3.8	3.6	39.8	29.5	25.0	25.2	0.0	23.2	29.5	20.9	12.7
Incr Delay (d2), s/veh	16.0	0.2	0.1	11.1	3.9	0.6	2.4	0.0	2.4	1.8	0.6	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	2.0	0.5	4.0	10.2	4.0	2.1	0.0	5.5	1.9	1.9	8.9
LnGrp Delay(d),s/veh	39.9	4.0	3.7	50.9	33.4	25.5	27.6	0.0	25.7	31.3	21.5	15.5
LnGrp LOS	D	A	A	D	C	C	C		C	C	C	B
Approach Vol, veh/h		1579			2000			356			705	
Approach Delay, s/veh		12.4			33.8			26.2			18.2	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		34.4	12.8	42.8		34.4	24.4	31.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		22.0	13.0	43.0		22.0	28.0	28.0
Max Q Clear Time (g_c+I1), s		14.2	9.0	6.6		21.1	19.6	24.0
Green Ext Time (p_c), s		1.2	0.1	9.1		0.3	0.7	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	904	25	7	518	25	2	3	9	38	5	5
Future Vol, veh/h	7	904	25	7	518	25	2	3	9	38	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	952	26	7	545	26	2	3	9	40	5	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	571	0	0	978	0	0	1554	1564	965	1553	1564	558
Stage 1	-	-	-	-	-	-	979	979	-	572	572	-
Stage 2	-	-	-	-	-	-	575	585	-	981	992	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1002	-	-	706	-	-	92	112	309	92	112	529
Stage 1	-	-	-	-	-	-	301	328	-	505	504	-
Stage 2	-	-	-	-	-	-	503	498	-	300	324	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1002	-	-	706	-	-	87	110	309	86	110	529
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	110	-	86	110	-
Stage 1	-	-	-	-	-	-	299	326	-	501	499	-
Stage 2	-	-	-	-	-	-	488	493	-	286	322	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	26.4	75.6
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	99	309	1002	-	-	706	-	-	88	529
HCM Lane V/C Ratio	0.053	0.031	0.007	-	-	0.01	-	-	0.514	0.01
HCM Control Delay (s)	43.4	17	8.6	-	-	10.2	-	-	83	11.9
HCM Lane LOS	E	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	0	-	-	2.2	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	507	236	25	415	138	165	156	19	206	186	97
Future Volume (veh/h)	132	507	236	25	415	138	165	156	19	206	186	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	138	528	246	26	432	144	172	162	20	215	194	101
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	1139	510	71	491	418	213	787	96	260	970	434
Arrive On Green	0.10	0.32	0.32	0.04	0.26	0.26	0.12	0.25	0.25	0.15	0.27	0.27
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3177	387	1774	3539	1583
Grp Volume(v), veh/h	138	528	246	26	432	144	172	89	93	215	194	101
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1794	1774	1770	1583
Q Serve(g_s), s	5.0	7.8	8.2	0.9	14.6	4.8	6.2	2.6	2.7	7.7	2.8	3.2
Cycle Q Clear(g_c), s	5.0	7.8	8.2	0.9	14.6	4.8	6.2	2.6	2.7	7.7	2.8	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	174	1139	510	71	491	418	213	438	445	260	970	434
V/C Ratio(X)	0.79	0.46	0.48	0.36	0.88	0.34	0.81	0.20	0.21	0.83	0.20	0.23
Avail Cap(c_a), veh/h	216	1139	510	189	539	458	243	438	445	297	970	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	17.7	17.9	30.7	23.2	19.6	28.2	19.6	19.6	27.2	18.3	18.5
Incr Delay (d2), s/veh	14.6	0.3	0.7	3.1	14.5	0.5	16.2	1.0	1.1	15.7	0.5	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.9	3.7	0.5	9.4	2.2	4.0	1.4	1.5	4.9	1.4	1.6
LnGrp Delay(d),s/veh	43.6	18.0	18.6	33.8	37.6	20.1	44.4	20.6	20.7	42.9	18.8	19.7
LnGrp LOS	D	B	B	C	D	C	D	C	C	D	B	B
Approach Vol, veh/h		912			602			354			510	
Approach Delay, s/veh		22.0			33.3			32.2			29.1	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	20.3	6.6	25.1	11.9	22.0	10.5	21.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	16.0	7.0	20.0	9.0	18.0	8.0	19.0
Max Q Clear Time (g_c+I1), s	9.7	4.7	2.9	10.2	8.2	5.2	7.0	16.6
Green Ext Time (p_c), s	0.1	0.6	0.0	2.9	0.0	1.1	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	27.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	15.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Future Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	159	169	0	0	106	51	303	3	27	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	157	0	-	-	-	0	619	644	169
Stage 1	-	-	-	-	-	-	487	487	-
Stage 2	-	-	-	-	-	-	132	157	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1423	-	0	0	-	-	452	391	875
Stage 1	-	-	0	0	-	-	618	550	-
Stage 2	-	-	0	0	-	-	894	768	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1423	-	-	-	-	-	401	0	875
Mov Cap-2 Maneuver	-	-	-	-	-	-	401	0	-
Stage 1	-	-	-	-	-	-	549	0	-
Stage 2	-	-	-	-	-	-	894	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.8	0	35.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	401	875	1423	-	-	-
HCM Lane V/C Ratio	0.764	0.031	0.112	-	-	-
HCM Control Delay (s)	37.7	9.2	7.8	-	-	-
HCM Lane LOS	E	A	A	-	-	-
HCM 95th %tile Q(veh)	6.3	0.1	0.4	-	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	249	292	23	375	0	0	0	0	72	2	167
Future Vol, veh/h	0	249	292	23	375	0	0	0	0	72	2	167
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	254	298	23	383	0	0	0	0	73	2	170
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	12.2	18.3	11.4
HCM LOS	B	C	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	249	292	23	375	74	167
LT Vol	0	0	23	0	72	0
Through Vol	249	0	0	375	2	0
RT Vol	0	292	0	0	0	167
Lane Flow Rate	254	298	23	383	76	170
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.414	0.427	0.042	0.638	0.154	0.29
Departure Headway (Hd)	5.866	5.156	6.506	5.999	7.328	6.123
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	612	697	550	601	489	586
Service Time	3.605	2.895	4.248	3.741	5.076	3.87
HCM Lane V/C Ratio	0.415	0.428	0.042	0.637	0.155	0.29
HCM Control Delay	12.7	11.7	9.5	18.8	11.4	11.4
HCM Lane LOS	B	B	A	C	B	B
HCM 95th-tile Q	2	2.1	0.1	4.5	0.5	1.2

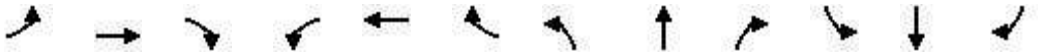
Intersection	
Int Delay, s/veh	7.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	224	61	237	298	87	261
Future Vol, veh/h	224	61	237	298	87	261
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	243	66	258	324	95	284

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	309	0	1116	276
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	840	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1252	-	230	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	424	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1252	-	183	763
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	424	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	183	763	-	-	1252	-
HCM Lane V/C Ratio	0.517	0.372	-	-	0.206	-
HCM Control Delay (s)	44	12.5	-	-	8.6	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	2.6	1.7	-	-	0.8	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	12	906	25	17	12	955	231	15	4	241	114
Future Volume (veh/h)	96	12	906	25	17	12	955	231	15	4	241	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	101	13	954	26	18	13	632	765	16	4	254	120
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	290	33	1112	102	66	32	924	947	20	5	296	256
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.52	0.52	0.52	0.16	0.16	0.16
Sat Flow, veh/h	1176	181	1583	233	366	177	1774	1818	38	29	1832	1583
Grp Volume(v), veh/h	114	0	954	57	0	0	632	0	781	258	0	120
Grp Sat Flow(s),veh/h/ln	1357	0	1583	775	0	0	1774	0	1856	1861	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.3	0.0	0.0	23.4	0.0	30.7	11.9	0.0	6.1
Cycle Q Clear(g_c), s	7.0	0.0	16.0	7.3	0.0	0.0	23.4	0.0	30.7	11.9	0.0	6.1
Prop In Lane	0.89		1.00	0.46		0.23	1.00		0.02	0.02		1.00
Lane Grp Cap(c), veh/h	323	0	1112	200	0	0	924	0	967	301	0	256
V/C Ratio(X)	0.35	0.00	0.86	0.29	0.00	0.00	0.68	0.00	0.81	0.86	0.00	0.47
Avail Cap(c_a), veh/h	323	0	1112	200	0	0	924	0	967	337	0	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	6.3	30.7	0.0	0.0	15.7	0.0	17.5	36.0	0.0	33.6
Incr Delay (d2), s/veh	0.7	0.0	6.9	0.8	0.0	0.0	4.1	0.0	7.2	17.7	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	25.2	1.2	0.0	0.0	12.5	0.0	17.6	7.6	0.0	2.7
LnGrp Delay(d),s/veh	33.1	0.0	13.2	31.5	0.0	0.0	19.8	0.0	24.7	53.7	0.0	34.9
LnGrp LOS	C		B	C			B		C	D		C
Approach Vol, veh/h		1068			57			1413			378	
Approach Delay, s/veh		15.3			31.5			22.5			47.7	
Approach LOS		B			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		18.3		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		32.7		18.0		13.9		9.3
Green Ext Time (p_c), s		5.9		0.0		0.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	49	262	3	112	48	1037	27	104	1014	12
Future Volume (veh/h)	20	5	49	262	3	112	48	1037	27	104	1014	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	21	5	52	279	3	119	51	1103	29	111	1079	13
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	141	61	241	456	431	367	122	1591	712	183	1734	21
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.45	0.45	0.10	0.48	0.48
Sat Flow, veh/h	255	264	1039	1341	1863	1583	1774	3539	1583	1774	3582	43
Grp Volume(v), veh/h	78	0	0	279	3	119	51	1103	29	111	533	559
Grp Sat Flow(s),veh/h/ln	1558	0	0	1341	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	8.3	0.1	3.5	1.5	13.9	0.6	3.3	12.4	12.4
Cycle Q Clear(g_c), s	2.1	0.0	0.0	10.4	0.1	3.5	1.5	13.9	0.6	3.3	12.4	12.4
Prop In Lane	0.27		0.67	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	443	0	0	456	431	367	122	1591	712	183	857	898
V/C Ratio(X)	0.18	0.00	0.00	0.61	0.01	0.32	0.42	0.69	0.04	0.61	0.62	0.62
Avail Cap(c_a), veh/h	527	0	0	532	536	456	223	1591	712	223	857	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	0.0	20.2	16.4	17.8	24.8	12.2	8.6	23.9	10.6	10.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.6	0.0	0.5	2.3	2.5	0.1	3.2	3.4	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	4.2	0.0	1.6	0.8	7.3	0.3	1.8	6.7	7.0
LnGrp Delay(d),s/veh	17.4	0.0	0.0	21.7	16.5	18.3	27.1	14.8	8.7	27.1	14.0	13.8
LnGrp LOS	B			C	B	B	C	B	A	C	B	B
Approach Vol, veh/h		78			401			1183			1203	
Approach Delay, s/veh		17.4			20.7			15.1			15.1	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	29.0		16.9	7.8	30.9		16.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	5.3	15.9		4.1	3.5	14.4		12.4
Green Ext Time (p_c), s	0.0	4.6		0.3	0.0	4.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	368	39	268	189	759	42	134	379	1063	149	35
Future Volume (veh/h)	199	368	39	268	189	759	42	134	379	1063	149	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	214	396	42	288	203	816	45	144	408	1143	160	38
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	299	516	54	301	299	1318	98	850	913	1076	1760	788
Arrive On Green	0.09	0.16	0.16	0.03	0.05	0.05	0.06	0.24	0.24	0.31	0.50	0.50
Sat Flow, veh/h	3442	3231	341	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	214	216	222	288	203	816	45	144	408	1143	160	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1803	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	4.8	9.3	9.4	6.7	8.6	8.5	2.0	2.6	9.2	25.0	1.9	0.6
Cycle Q Clear(g_c), s	4.8	9.3	9.4	6.7	8.6	8.5	2.0	2.6	9.2	25.0	1.9	0.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	299	283	288	301	299	1318	98	850	913	1076	1760	788
V/C Ratio(X)	0.72	0.76	0.77	0.96	0.68	0.62	0.46	0.17	0.45	1.06	0.09	0.05
Avail Cap(c_a), veh/h	301	354	361	301	373	1428	155	850	913	1076	1760	788
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	0.72	0.72	0.72
Uniform Delay (d), s/veh	35.6	32.2	32.2	38.7	35.9	6.4	36.6	24.1	21.2	27.5	10.6	4.1
Incr Delay (d2), s/veh	7.9	7.5	7.8	34.0	2.7	0.6	3.3	0.4	1.6	42.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.1	5.3	4.6	4.6	3.4	1.1	1.3	3.8	18.1	1.0	0.3
LnGrp Delay(d),s/veh	43.4	39.6	40.0	72.7	38.6	7.0	39.9	24.5	22.8	69.5	10.7	4.2
LnGrp LOS	D	D	D	E	D	A	D	C	C	F	B	A
Approach Vol, veh/h		652			1307			597			1341	
Approach Delay, s/veh		41.0			26.4			24.5			60.7	
Approach LOS		D			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.0	23.2	11.0	16.8	8.4	43.8	10.9	16.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	25.0	16.0	7.0	16.0	7.0	34.0	7.0	16.0
Max Q Clear Time (g_c+I1), s	27.0	11.2	8.7	11.4	4.0	3.9	6.8	10.6
Green Ext Time (p_c), s	0.0	1.1	0.0	1.0	0.0	1.0	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	40.3
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1225	621	623	1402	0	0	0	0	596	0	151
Future Volume (veh/h)	0	1225	621	623	1402	0	0	0	0	596	0	151
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1250	634	636	1431	0				656	0	103
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1327	594	699	2223	0				965	0	430
Arrive On Green	0.00	0.12	0.12	0.41	1.00	0.00				0.27	0.00	0.27
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1250	634	636	1431	0				656	0	103
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	28.0	30.0	13.9	0.0	0.0				13.2	0.0	4.1
Cycle Q Clear(g_c), s	0.0	28.0	30.0	13.9	0.0	0.0				13.2	0.0	4.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1327	594	699	2223	0				965	0	430
V/C Ratio(X)	0.00	0.94	1.07	0.91	0.64	0.00				0.68	0.00	0.24
Avail Cap(c_a), veh/h	0	1327	594	731	2256	0				965	0	430
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.48	0.48	0.51	0.51	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	34.2	35.0	23.1	0.0	0.0				26.0	0.0	22.7
Incr Delay (d2), s/veh	0.0	7.5	45.9	8.7	0.3	0.0				3.9	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.1	20.7	7.4	0.1	0.0				7.0	0.0	1.9
LnGrp Delay(d),s/veh	0.0	41.7	80.9	31.8	0.3	0.0				29.9	0.0	24.0
LnGrp LOS		D	F	C	A					C		C
Approach Vol, veh/h		1884			2067						759	
Approach Delay, s/veh		54.9			10.0						29.1	
Approach LOS		D			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			20.3	34.0		25.7		54.3
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			17.0	30.0		21.0		51.0
Max Q Clear Time (g_c+I1), s			15.9	32.0		15.2		2.0
Green Ext Time (p_c), s			0.3	0.0		1.6		16.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	1728	0	0	1421	401	569	0	751	0	0	0
Future Volume (veh/h)	125	1728	0	0	1421	401	569	0	751	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	128	1763	0	0	1450	409	848	0	480			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	159	2306	0	0	1597	497	1584	0	707			
Arrive On Green	0.18	0.91	0.00	0.00	0.63	0.63	0.45	0.00	0.45			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	128	1763	0	0	1450	409	848	0	480			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	5.5	8.4	0.0	0.0	19.7	15.9	13.9	0.0	19.3			
Cycle Q Clear(g_c), s	5.5	8.4	0.0	0.0	19.7	15.9	13.9	0.0	19.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	159	2306	0	0	1597	497	1584	0	707			
V/C Ratio(X)	0.81	0.76	0.00	0.00	0.91	0.82	0.54	0.00	0.68			
Avail Cap(c_a), veh/h	222	2543	0	0	1653	515	1584	0	707			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.33	0.33	0.00	0.00	0.61	0.61	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.2	2.4	0.0	0.0	13.9	13.2	16.1	0.0	17.6			
Incr Delay (d2), s/veh	4.9	0.4	0.0	0.0	4.9	6.4	1.3	0.0	5.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.9	3.0	0.0	0.0	9.6	7.5	7.0	0.0	9.4			
LnGrp Delay(d),s/veh	37.1	2.9	0.0	0.0	18.8	19.6	17.4	0.0	22.8			
LnGrp LOS	D	A			B	B	B		C			
Approach Vol, veh/h		1891			1859			1328				
Approach Delay, s/veh		5.2			19.0			19.3				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		39.7		40.3			11.2	29.1
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		32.0		40.0			10.0	26.0
Max Q Clear Time (g_c+I1), s		21.3		10.4			7.5	21.7
Green Ext Time (p_c), s		4.1		15.3			0.1	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	456	1844	179	140	1353	79	99	113	176	62	72	369
Future Volume (veh/h)	456	1844	179	140	1353	79	99	113	176	62	72	369
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	465	1882	183	143	1381	81	101	115	180	63	73	377
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	496	2160	673	179	1576	389	368	213	333	285	604	956
Arrive On Green	0.56	0.85	0.85	0.10	0.25	0.25	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	937	656	1026	1080	1863	1583
Grp Volume(v), veh/h	465	1882	183	143	1381	81	101	0	295	63	73	377
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	937	0	1682	1080	1863	1583
Q Serve(g_s), s	19.4	17.1	1.8	6.3	16.6	3.3	6.8	0.0	11.5	4.1	2.2	0.0
Cycle Q Clear(g_c), s	19.4	17.1	1.8	6.3	16.6	3.3	9.0	0.0	11.5	15.6	2.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	496	2160	673	179	1576	389	368	0	546	285	604	956
V/C Ratio(X)	0.94	0.87	0.27	0.80	0.88	0.21	0.27	0.00	0.54	0.22	0.12	0.39
Avail Cap(c_a), veh/h	643	2352	732	266	1602	396	368	0	546	285	604	956
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	4.8	3.6	35.2	29.0	24.0	22.2	0.0	22.1	28.5	19.0	8.2
Incr Delay (d2), s/veh	13.4	2.4	0.1	9.9	5.7	0.3	1.8	0.0	3.8	1.8	0.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.1	7.4	0.7	3.6	7.9	1.4	1.9	0.0	5.9	1.3	1.2	4.6
LnGrp Delay(d),s/veh	30.4	7.1	3.7	45.1	34.7	24.2	24.0	0.0	26.0	30.3	19.4	9.5
LnGrp LOS	C	A	A	D	C	C	C		C	C	B	A
Approach Vol, veh/h		2530			1605			396			513	
Approach Delay, s/veh		11.2			35.1			25.5			13.4	
Approach LOS		B			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.0	12.1	38.0		30.0	26.4	23.7
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	12.0	37.0		19.0	29.0	20.0
Max Q Clear Time (g_c+I1), s		13.5	8.3	19.1		17.6	21.4	18.6
Green Ext Time (p_c), s		1.1	0.1	12.5		0.3	0.9	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	942	2	7	895	104	0	3	10	29	2	6
Future Vol, veh/h	2	942	2	7	895	104	0	3	10	29	2	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1035	2	8	984	114	0	3	11	32	2	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1098	0	0	1037	0	0	2098	2154	1036	2099	2098	1041
Stage 1	-	-	-	-	-	-	1040	1040	-	1057	1057	-
Stage 2	-	-	-	-	-	-	1058	1114	-	1042	1041	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	636	-	-	670	-	-	38	48	281	38	52	279
Stage 1	-	-	-	-	-	-	278	307	-	272	302	-
Stage 2	-	-	-	-	-	-	272	284	-	277	307	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	636	-	-	670	-	-	35	47	281	34	51	279
Mov Cap-2 Maneuver	-	-	-	-	-	-	35	47	-	34	51	-
Stage 1	-	-	-	-	-	-	277	306	-	271	298	-
Stage 2	-	-	-	-	-	-	260	281	-	262	306	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	34.2	266.2
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	47	281	636	-	-	670	-	-	35	279
HCM Lane V/C Ratio	0.07	0.039	0.003	-	-	0.011	-	-	0.973	0.024
HCM Control Delay (s)	87.3	18.3	10.7	-	-	10.4	-	-	$ 314.2	18.2
HCM Lane LOS	F	C	B	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	0	-	-	3.5	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	696	296	54	558	320	219	340	23	198	272	174
Future Volume (veh/h)	166	696	296	54	558	320	219	340	23	198	272	174
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	175	733	312	57	587	337	231	358	24	208	286	183
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	1326	593	111	605	515	244	758	51	244	796	356
Arrive On Green	0.11	0.37	0.37	0.06	0.32	0.32	0.14	0.22	0.22	0.14	0.22	0.22
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	3368	225	1774	3539	1583
Grp Volume(v), veh/h	175	733	312	57	587	337	231	187	195	208	286	183
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1823	1774	1770	1583
Q Serve(g_s), s	7.8	13.1	12.3	2.5	24.8	14.6	10.3	7.3	7.4	9.2	5.5	8.1
Cycle Q Clear(g_c), s	7.8	13.1	12.3	2.5	24.8	14.6	10.3	7.3	7.4	9.2	5.5	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	200	1326	593	111	605	515	244	398	410	244	796	356
V/C Ratio(X)	0.88	0.55	0.53	0.51	0.97	0.65	0.95	0.47	0.47	0.85	0.36	0.51
Avail Cap(c_a), veh/h	200	1326	593	155	605	515	244	398	410	244	796	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	19.7	19.5	36.3	26.6	23.2	34.2	26.9	26.9	33.7	26.1	27.2
Incr Delay (d2), s/veh	32.6	0.5	0.9	3.6	29.0	3.0	43.1	4.0	3.9	24.1	1.3	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	6.4	5.5	1.3	17.6	6.8	8.0	4.0	4.2	6.1	2.8	4.0
LnGrp Delay(d),s/veh	67.6	20.2	20.3	39.9	55.6	26.1	77.3	30.8	30.8	57.8	27.4	32.4
LnGrp LOS	E	C	C	D	E	C	E	C	C	E	C	C
Approach Vol, veh/h		1220			981			613			677	
Approach Delay, s/veh		27.0			44.6			48.3			38.1	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	22.0	9.0	34.0	15.0	22.0	13.0	30.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	18.0	7.0	28.0	11.0	18.0	9.0	26.0
Max Q Clear Time (g_c+I1), s	11.2	9.4	4.5	15.1	12.3	10.1	9.8	26.8
Green Ext Time (p_c), s	0.0	1.3	0.0	4.7	0.0	1.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	112.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	113	318	0	0	156	105	216	2	99	0	0	0
Future Vol, veh/h	113	318	0	0	156	105	216	2	99	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	179	505	0	0	248	167	343	3	157	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	415	0	-	-	-	0	1195	1278	505
Stage 1	-	-	-	-	-	-	863	863	-
Stage 2	-	-	-	-	-	-	332	415	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1144	-	0	0	-	-	~ 206	166	567
Stage 1	-	-	0	0	-	-	413	372	-
Stage 2	-	-	0	0	-	-	727	592	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1144	-	-	-	-	-	~ 174	0	567
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 174	0	-
Stage 1	-	-	-	-	-	-	349	0	-
Stage 2	-	-	-	-	-	-	727	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.3	0	$ 354.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	174	567	1144	-	-	-
HCM Lane V/C Ratio	1.989	0.277	0.157	-	-	-
HCM Control Delay (s)	$ 508.9	13.8	8.7	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	26.4	1.1	0.6	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	20.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	294	339	50	322	0	0	0	0	139	5	151
Future Vol, veh/h	0	294	339	50	322	0	0	0	0	139	5	151
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	359	413	61	393	0	0	0	0	170	6	184
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	20	25.2	14.3
HCM LOS	C	D	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	294	339	50	322	144	151
LT Vol	0	0	50	0	139	0
Through Vol	294	0	0	322	5	0
RT Vol	0	339	0	0	0	151
Lane Flow Rate	359	413	61	393	176	184
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.648	0.666	0.125	0.747	0.387	0.344
Departure Headway (Hd)	6.51	5.796	7.355	6.844	7.925	6.717
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	552	620	484	526	453	532
Service Time	4.293	3.578	5.147	4.635	5.707	4.497
HCM Lane V/C Ratio	0.65	0.666	0.126	0.747	0.389	0.346
HCM Control Delay	20.6	19.5	11.2	27.4	15.7	13
HCM Lane LOS	C	C	B	D	C	B
HCM 95th-tile Q	4.6	5	0.4	6.4	1.8	1.5

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	466	44	154	315	31	149
Future Vol, veh/h	466	44	154	315	31	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	536	51	177	362	36	171

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	587	0	1278	562
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	716	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	988	-	183	526
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	988	-	150	526
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	18.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	150	526	-	-	988	-
HCM Lane V/C Ratio	0.238	0.326	-	-	0.179	-
HCM Control Delay (s)	36.3	15.1	-	-	9.4	-
HCM Lane LOS	E	C	-	-	A	-
HCM 95th %tile Q(veh)	0.9	1.4	-	-	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	7	1112	4	2	0	965	92	12	3	111	74
Future Volume (veh/h)	95	7	1112	4	2	0	965	92	12	3	111	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	98	7	1146	4	2	0	1074	0	0	3	114	76
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	362	23	1207	136	54	0	2007	1053	0	4	164	143
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.00	0.57	0.00	0.00	0.09	0.09	0.09
Sat Flow, veh/h	1403	117	1583	319	276	0	3548	1863	0	48	1813	1583
Grp Volume(v), veh/h	105	0	1146	6	0	0	1074	0	0	117	0	76
Grp Sat Flow(s),veh/h/ln	1520	0	1583	595	0	0	1774	1863	0	1860	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	15.3	0.0	0.0	5.0	0.0	3.7
Cycle Q Clear(g_c), s	4.1	0.0	16.0	4.2	0.0	0.0	15.3	0.0	0.0	5.0	0.0	3.7
Prop In Lane	0.93		1.00	0.67		0.00	1.00		0.00	0.03		1.00
Lane Grp Cap(c), veh/h	384	0	1207	191	0	0	2007	1053	0	168	0	143
V/C Ratio(X)	0.27	0.00	0.95	0.03	0.00	0.00	0.54	0.00	0.00	0.70	0.00	0.53
Avail Cap(c_a), veh/h	384	0	1207	191	0	0	2007	1053	0	366	0	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	4.2	26.4	0.0	0.0	11.0	0.0	0.0	35.9	0.0	35.4
Incr Delay (d2), s/veh	0.4	0.0	15.4	0.1	0.0	0.0	1.0	0.0	0.0	5.1	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	30.6	0.1	0.0	0.0	7.7	0.0	0.0	2.8	0.0	1.7
LnGrp Delay(d),s/veh	28.3	0.0	19.6	26.5	0.0	0.0	12.0	0.0	0.0	41.1	0.0	38.4
LnGrp LOS	C		B	C			B			D		D
Approach Vol, veh/h		1251			6			1074			193	
Approach Delay, s/veh		20.3			26.5			12.0			40.0	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.0		20.0		11.3		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		46.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		17.3		18.0		7.0		6.2
Green Ext Time (p_c), s		4.4		0.0		0.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.3
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2	28	116	3	44	53	990	32	56	1106	14
Future Volume (veh/h)	2	2	28	116	3	44	53	990	32	56	1106	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	2	2	29	121	3	46	55	1031	33	58	1152	15
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	22	194	349	257	218	135	1873	838	140	1903	25
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.08	0.53	0.53	0.08	0.53	0.53
Sat Flow, veh/h	37	157	1406	1373	1863	1583	1774	3539	1583	1774	3578	47
Grp Volume(v), veh/h	33	0	0	121	3	46	55	1031	33	58	570	597
Grp Sat Flow(s),veh/h/ln	1600	0	0	1373	1863	1583	1774	1770	1583	1774	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	2.8	0.1	1.2	1.4	9.1	0.5	1.5	10.5	10.5
Cycle Q Clear(g_c), s	0.9	0.0	0.0	3.7	0.1	1.2	1.4	9.1	0.5	1.5	10.5	10.5
Prop In Lane	0.06		0.88	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	301	0	0	349	257	218	135	1873	838	140	941	987
V/C Ratio(X)	0.11	0.00	0.00	0.35	0.01	0.21	0.41	0.55	0.04	0.41	0.61	0.61
Avail Cap(c_a), veh/h	619	0	0	625	631	536	263	1873	838	263	941	987
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	0.0	19.1	17.6	18.1	20.8	7.4	5.3	20.7	7.6	7.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.6	0.0	0.5	2.0	1.2	0.1	1.9	2.9	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.5	0.0	0.6	0.8	4.7	0.2	0.8	5.8	6.1
LnGrp Delay(d),s/veh	18.1	0.0	0.0	19.6	17.6	18.6	22.8	8.6	5.4	22.7	10.5	10.4
LnGrp LOS	B			B	B	B	C	A	A	C	B	B
Approach Vol, veh/h		33			170			1119			1225	
Approach Delay, s/veh		18.1			19.3			9.2			11.0	
Approach LOS		B			B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	29.0		10.5	7.6	29.1		10.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	25.0		16.0	7.0	25.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	11.1		2.9	3.4	12.5		5.7
Green Ext Time (p_c), s	0.0	5.6		0.1	0.0	5.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Future Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	224	433	45	811	229	1118	47	222	526	1516	248	40
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	540	432	45	688	329	1583	82	501	952	1348	1724	771
Arrive On Green	0.16	0.13	0.13	0.07	0.06	0.06	0.05	0.14	0.14	0.39	0.49	0.49
Sat Flow, veh/h	3442	3238	335	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	224	236	242	811	229	1118	47	222	526	1516	248	40
Grp Sat Flow(s),veh/h/ln	1721	1770	1804	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	7.0	16.0	16.0	24.0	14.5	11.1	3.1	6.9	11.9	47.0	4.6	0.9
Cycle Q Clear(g_c), s	7.0	16.0	16.0	24.0	14.5	11.1	3.1	6.9	11.9	47.0	4.6	0.9
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	540	236	240	688	329	1583	82	501	952	1348	1724	771
V/C Ratio(X)	0.41	1.00	1.01	1.18	0.70	0.71	0.57	0.44	0.55	1.12	0.14	0.05
Avail Cap(c_a), veh/h	540	236	240	688	419	1718	118	501	952	1348	1724	771
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	45.6	52.0	52.0	56.0	53.4	7.8	56.1	47.2	15.4	36.5	17.0	5.1
Incr Delay (d2), s/veh	0.5	58.3	59.9	87.7	1.7	0.6	6.2	2.8	2.3	64.7	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	11.6	12.0	19.8	7.6	7.2	1.7	3.6	4.8	34.4	2.3	0.4
LnGrp Delay(d),s/veh	46.1	110.3	112.0	143.8	55.1	8.4	62.3	50.0	17.7	101.2	17.1	5.3
LnGrp LOS	D	F	F	F	E	A	E	D	B	F	B	A
Approach Vol, veh/h		702			2158			795			1804	
Approach Delay, s/veh		90.4			64.2			29.4			87.5	
Approach LOS		F			E			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	51.0	21.0	28.0	20.0	9.5	62.5	22.8	25.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	47.0	17.0	24.0	16.0	8.0	56.0	13.0	27.0
Max Q Clear Time (g_c+I1), s	49.0	13.9	26.0	18.0	5.1	6.6	9.0	16.5
Green Ext Time (p_c), s	0.0	1.1	0.0	0.0	0.0	1.7	0.3	4.7

Intersection Summary	
HCM 2010 Ctrl Delay	70.2
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	944	691	904	1958	0	0	0	0	397	6	326
Future Volume (veh/h)	0	944	691	904	1958	0	0	0	0	397	6	326
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	983	720	942	2040	0				522	0	229
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1268	567	993	2408	0				898	0	401
Arrive On Green	0.00	0.12	0.12	0.58	1.00	0.00				0.25	0.00	0.25
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	983	720	942	2040	0				522	0	229
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	32.4	43.0	30.7	0.0	0.0				15.5	0.0	15.2
Cycle Q Clear(g_c), s	0.0	32.4	43.0	30.7	0.0	0.0				15.5	0.0	15.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1268	567	993	2408	0				898	0	401
V/C Ratio(X)	0.00	0.78	1.27	0.95	0.85	0.00				0.58	0.00	0.57
Avail Cap(c_a), veh/h	0	1268	567	1090	2507	0				898	0	401
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.14	0.14	0.15	0.15	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	48.2	52.9	24.5	0.0	0.0				39.3	0.0	39.1
Incr Delay (d2), s/veh	0.0	0.4	123.1	3.4	0.4	0.0				2.7	0.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.0	38.3	14.6	0.1	0.0				8.0	0.0	7.3
LnGrp Delay(d),s/veh	0.0	48.6	176.0	27.9	0.4	0.0				42.0	0.0	45.0
LnGrp LOS		D	F	C	A					D		D
Approach Vol, veh/h		1703			2982						751	
Approach Delay, s/veh		102.5			9.1						42.9	
Approach LOS		F			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			38.6	47.0		34.4		85.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			38.0	43.0		27.0		85.0
Max Q Clear Time (g_c+I1), s			32.7	45.0		17.5		2.0
Green Ext Time (p_c), s			2.0	0.0		2.1		39.3

Intersection Summary	
HCM 2010 Ctrl Delay	43.0
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	1239	0	0	2169	664	737	0	748	0	0	0
Future Volume (veh/h)	118	1239	0	0	2169	664	737	0	748	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	127	1332	0	0	2332	714	1044	0	534			
Adj No. of Lanes	1	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	148	2952	0	0	2359	734	1252	0	559			
Arrive On Green	0.17	1.00	0.00	0.00	0.93	0.93	0.35	0.00	0.35			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	3548	0	1583			
Grp Volume(v), veh/h	127	1332	0	0	2332	714	1044	0	534			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	8.4	0.0	0.0	0.0	48.0	39.8	32.4	0.0	39.5			
Cycle Q Clear(g_c), s	8.4	0.0	0.0	0.0	48.0	39.8	32.4	0.0	39.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	148	2952	0	0	2359	734	1252	0	559			
V/C Ratio(X)	0.86	0.45	0.00	0.00	0.99	0.97	0.83	0.00	0.96			
Avail Cap(c_a), veh/h	148	2966	0	0	2373	739	1252	0	559			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.56	0.56	0.00	0.00	0.26	0.26	1.00	0.00	1.00			
Uniform Delay (d), s/veh	49.3	0.0	0.0	0.0	4.1	3.8	35.6	0.0	37.9			
Incr Delay (d2), s/veh	23.6	0.1	0.0	0.0	7.0	11.2	6.6	0.0	28.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.1	0.0	0.0	0.0	19.2	16.1	17.0	0.0	21.6			
LnGrp Delay(d),s/veh	72.9	0.1	0.0	0.0	11.1	14.9	42.3	0.0	66.6			
LnGrp LOS	E	A			B	B	D		E			
Approach Vol, veh/h		1459			3046			1578				
Approach Delay, s/veh		6.4			12.0			50.5				
Approach LOS		A			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		46.3		73.7			14.0	59.7
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		42.0		70.0			10.0	56.0
Max Q Clear Time (g_c+I1), s		41.5		2.0			10.4	50.0
Green Ext Time (p_c), s		0.3		12.4			0.0	5.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Future Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	378	1516	295	199	2146	211	442	155	224	101	108	529
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	1690	526	371	2136	528	311	247	357	232	667	897
Arrive On Green	0.42	0.66	0.66	0.21	0.33	0.33	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	788	690	997	1000	1863	1583
Grp Volume(v), veh/h	378	1516	295	199	2146	211	442	0	379	101	108	529
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	788	0	1687	1000	1863	1583
Q Serve(g_s), s	25.0	29.7	11.9	12.0	40.0	12.3	38.3	0.0	22.3	11.2	4.7	1.1
Cycle Q Clear(g_c), s	25.0	29.7	11.9	12.0	40.0	12.3	43.0	0.0	22.3	33.5	4.7	1.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	370	1690	526	371	2136	528	311	0	604	232	667	897
V/C Ratio(X)	1.02	0.90	0.56	0.54	1.00	0.40	1.42	0.00	0.63	0.43	0.16	0.59
Avail Cap(c_a), veh/h	370	1865	581	371	2136	528	311	0	604	232	667	897
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	18.4	15.4	42.3	40.0	30.8	44.6	0.0	31.9	45.7	26.2	16.9
Incr Delay (d2), s/veh	47.6	4.7	0.8	1.5	20.6	0.5	207.0	0.0	4.9	5.8	0.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.0	14.2	5.2	6.0	20.7	5.5	28.2	0.0	11.2	3.5	2.5	1.0
LnGrp Delay(d),s/veh	82.6	23.1	16.2	43.8	60.6	31.3	251.5	0.0	36.7	51.5	26.7	19.8
LnGrp LOS	F	C	B	D	F	C	F		D	D	C	B
Approach Vol, veh/h		2189			2556			821			738	
Approach Delay, s/veh		32.5			56.9			152.4			25.1	
Approach LOS		C			E			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		47.0	29.1	43.9		47.0	29.0	44.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		43.0	21.0	44.0		43.0	25.0	40.0
Max Q Clear Time (g_c+I1), s		45.0	14.0	31.7		35.5	27.0	42.0
Green Ext Time (p_c), s		0.0	0.3	8.2		1.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	57.1
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	15.5

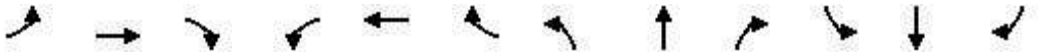
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	1187	25	7	794	32	2	3	9	47	5	5
Future Vol, veh/h	7	1187	25	7	794	32	2	3	9	47	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1249	26	7	836	34	2	3	9	49	5	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	870	0	0	1275	0	0	2146	2160	1262	2145	2156	853
Stage 1	-	-	-	-	-	-	1276	1276	-	867	867	-
Stage 2	-	-	-	-	-	-	870	884	-	1278	1289	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	775	-	-	545	-	-	35	47	207	~ 35	48	359
Stage 1	-	-	-	-	-	-	205	238	-	348	370	-
Stage 2	-	-	-	-	-	-	346	363	-	204	234	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	775	-	-	545	-	-	31	46	207	~ 31	47	359
Mov Cap-2 Maneuver	-	-	-	-	-	-	31	46	-	~ 31	47	-
Stage 1	-	-	-	-	-	-	203	236	-	345	365	-
Stage 2	-	-	-	-	-	-	332	358	-	190	232	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	54.6	$ 559.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	39	207	775	-	-	545	-	-	32	359
HCM Lane V/C Ratio	0.135	0.046	0.01	-	-	0.014	-	-	1.711	0.015
HCM Control Delay (s)	111.2	23.2	9.7	-	-	11.7	-	-	$ 612.3	15.2
HCM Lane LOS	F	C	A	-	-	B	-	-	F	C
HCM 95th %tile Q(veh)	0.4	0.1	0	-	-	0	-	-	6.2	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	647	236	96	550	208	165	157	90	278	189	97
Future Volume (veh/h)	132	647	236	96	550	208	165	157	90	278	189	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	138	674	246	100	573	217	172	164	94	290	197	101
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	1248	558	130	622	529	209	458	249	326	963	431
Arrive On Green	0.09	0.35	0.35	0.07	0.33	0.33	0.12	0.21	0.21	0.18	0.27	0.27
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	2213	1206	1774	3539	1583
Grp Volume(v), veh/h	138	674	246	100	573	217	172	129	129	290	197	101
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1650	1774	1770	1583
Q Serve(g_s), s	6.7	13.3	10.4	4.8	25.8	9.2	8.2	5.4	5.8	13.9	3.7	4.3
Cycle Q Clear(g_c), s	6.7	13.3	10.4	4.8	25.8	9.2	8.2	5.4	5.8	13.9	3.7	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.73	1.00		1.00
Lane Grp Cap(c), veh/h	163	1248	558	130	622	529	209	366	341	326	963	431
V/C Ratio(X)	0.85	0.54	0.44	0.77	0.92	0.41	0.82	0.35	0.38	0.89	0.20	0.23
Avail Cap(c_a), veh/h	163	1248	558	224	663	564	326	366	341	346	963	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	22.5	21.6	39.6	27.9	22.4	37.5	29.6	29.7	34.7	24.4	24.6
Incr Delay (d2), s/veh	31.7	0.5	0.5	9.2	17.7	0.5	9.2	2.7	3.2	22.9	0.5	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	6.5	4.6	2.7	16.3	4.1	4.5	2.9	2.9	8.8	1.9	2.0
LnGrp Delay(d),s/veh	70.6	23.0	22.1	48.8	45.6	22.9	46.7	32.2	32.9	57.6	24.9	25.9
LnGrp LOS	E	C	C	D	D	C	D	C	C	E	C	C
Approach Vol, veh/h		1058			890			430			588	
Approach Delay, s/veh		29.0			40.4			38.2			41.2	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	22.0	10.4	34.7	14.3	27.7	12.0	33.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	18.0	11.0	28.0	16.0	19.0	8.0	31.0
Max Q Clear Time (g_c+I1), s	15.9	7.8	6.8	15.3	10.2	6.3	8.7	27.8
Green Ext Time (p_c), s	0.1	0.9	0.1	4.1	0.2	1.1	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	36.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	41.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	206	174	0	0	104	50	335	3	28	0	0	0
Future Vol, veh/h	206	174	0	0	104	50	335	3	28	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	-	-	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	212	179	0	0	107	52	345	3	29	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	159	0	-	-	-	0	736	762	179
Stage 1	-	-	-	-	-	-	603	603	-
Stage 2	-	-	-	-	-	-	133	159	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1420	-	0	0	-	-	386	335	864
Stage 1	-	-	0	0	-	-	546	488	-
Stage 2	-	-	0	0	-	-	893	766	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1420	-	-	-	-	-	~ 328	0	864
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 328	0	-
Stage 1	-	-	-	-	-	-	465	0	-
Stage 2	-	-	-	-	-	-	893	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.3	0	96.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	328	864	1420	-	-	-
HCM Lane V/C Ratio	1.062	0.033	0.15	-	-	-
HCM Control Delay (s)	103.8	9.3	8	-	-	-
HCM Lane LOS	F	A	A	-	-	-
HCM 95th %tile Q(veh)	12.8	0.1	0.5	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	18.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	309	342	24	416	0	0	0	0	75	2	216
Future Vol, veh/h	0	309	342	24	416	0	0	0	0	75	2	216
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	315	349	24	424	0	0	0	0	77	2	220
Number of Lanes	0	1	1	1	1	0	0	0	0	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	15.3	25.5	13.1
HCM LOS	C	D	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	97%	0%
Vol Thru, %	100%	0%	0%	100%	3%	0%
Vol Right, %	0%	100%	0%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	309	342	24	416	77	216
LT Vol	0	0	24	0	75	0
Through Vol	309	0	0	416	2	0
RT Vol	0	342	0	0	0	216
Lane Flow Rate	315	349	24	424	79	220
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.543	0.532	0.047	0.755	0.168	0.397
Departure Headway (Hd)	6.2	5.487	6.916	6.407	7.695	6.484
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	580	653	516	560	465	553
Service Time	3.962	3.249	4.683	4.174	5.463	4.251
HCM Lane V/C Ratio	0.543	0.534	0.047	0.757	0.17	0.398
HCM Control Delay	16.2	14.4	10	26.4	12	13.5
HCM Lane LOS	C	B	A	D	B	B
HCM 95th-tile Q	3.2	3.1	0.1	6.6	0.6	1.9

Intersection	
Int Delay, s/veh	13

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	312	71	272	360	96	306
Future Vol, veh/h	312	71	272	360	96	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	339	77	296	391	104	333

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	416	0	1361	378
Stage 1	-	-	-	-	378	-
Stage 2	-	-	-	-	983	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1143	-	163	669
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	362	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1143	-	121	669
Mov Cap-2 Maneuver	-	-	-	-	121	-
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	362	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	39.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	121	669	-	-	1143	-
HCM Lane V/C Ratio	0.862	0.497	-	-	0.259	-
HCM Control Delay (s)	115.6	15.6	-	-	9.2	-
HCM Lane LOS	F	C	-	-	A	-
HCM 95th %tile Q(veh)	5.3	2.8	-	-	1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	12	1292	25	17	12	1326	264	15	4	261	138
Future Volume (veh/h)	116	12	1292	25	17	12	1326	264	15	4	261	138
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	122	13	1360	26	18	13	1610	0	0	4	275	145
Adj No. of Lanes	0	1	1	0	1	0	2	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	12	1214	44	27	8	2247	1180	0	4	245	211
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.63	0.00	0.00	0.13	0.13	0.13
Sat Flow, veh/h	865	92	1583	0	204	60	3548	1863	0	27	1835	1583
Grp Volume(v), veh/h	135	0	1360	57	0	0	1610	0	0	279	0	145
Grp Sat Flow(s),veh/h/ln	958	0	1583	265	0	0	1774	1863	0	1861	0	1583
Q Serve(g_s), s	0.0	0.0	16.0	0.0	0.0	0.0	36.6	0.0	0.0	16.0	0.0	10.5
Cycle Q Clear(g_c), s	16.0	0.0	16.0	16.0	0.0	0.0	36.6	0.0	0.0	16.0	0.0	10.5
Prop In Lane	0.90		1.00	0.46		0.23	1.00		0.00	0.01		1.00
Lane Grp Cap(c), veh/h	185	0	1214	79	0	0	2247	1180	0	248	0	211
V/C Ratio(X)	0.73	0.00	1.12	0.72	0.00	0.00	0.72	0.00	0.00	1.12	0.00	0.69
Avail Cap(c_a), veh/h	185	0	1214	79	0	0	2247	1180	0	248	0	211
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.4	0.0	5.1	50.8	0.0	0.0	14.8	0.0	0.0	52.0	0.0	49.6
Incr Delay (d2), s/veh	13.7	0.0	65.6	27.3	0.0	0.0	2.0	0.0	0.0	94.6	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	62.2	2.5	0.0	0.0	18.3	0.0	0.0	14.7	0.0	5.1
LnGrp Delay(d),s/veh	66.1	0.0	70.7	78.1	0.0	0.0	16.8	0.0	0.0	146.6	0.0	58.6
LnGrp LOS	E		F	E			B			F		E
Approach Vol, veh/h		1495			57			1610			424	
Approach Delay, s/veh		70.3			78.1			16.8			116.5	
Approach LOS		E			E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		80.0		20.0		20.0		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		76.0		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		38.6		18.0		18.0		18.0
Green Ext Time (p_c), s		8.4		0.0		0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	51.8
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	65	277	3	112	62	1441	41	104	1420	12
Future Volume (veh/h)	20	5	65	277	3	112	62	1441	41	104	1420	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	21	5	69	295	3	119	66	1533	44	111	1511	13
Adj No. of Lanes	0	1	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	52	265	435	434	369	130	1770	792	160	1860	16
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.50	0.50	0.09	0.52	0.52
Sat Flow, veh/h	206	222	1136	1320	1863	1583	1774	3539	1583	1774	3596	31
Grp Volume(v), veh/h	95	0	0	295	3	119	66	1533	44	111	743	781
Grp Sat Flow(s),veh/h/ln	1565	0	0	1320	1863	1583	1774	1770	1583	1774	1770	1857
Q Serve(g_s), s	0.0	0.0	0.0	10.4	0.1	4.2	2.4	26.0	1.0	4.1	23.8	23.8
Cycle Q Clear(g_c), s	3.2	0.0	0.0	13.6	0.1	4.2	2.4	26.0	1.0	4.1	23.8	23.8
Prop In Lane	0.22		0.73	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	429	0	0	435	434	369	130	1770	792	160	915	961
V/C Ratio(X)	0.22	0.00	0.00	0.68	0.01	0.32	0.51	0.87	0.06	0.69	0.81	0.81
Avail Cap(c_a), veh/h	455	0	0	457	466	396	183	1770	792	183	915	961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	0.0	24.8	20.0	21.6	30.3	15.0	8.7	30.0	13.7	13.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	3.8	0.0	0.5	3.0	6.0	0.1	9.1	7.8	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	5.8	0.0	1.9	1.3	14.0	0.4	2.4	13.3	14.1
LnGrp Delay(d),s/veh	21.5	0.0	0.0	28.6	20.0	22.1	33.3	20.9	8.9	39.1	21.4	21.1
LnGrp LOS	C			C	C	C	C	C	A	D	C	C
Approach Vol, veh/h		95			417			1643			1635	
Approach Delay, s/veh		21.5			26.7			21.1			22.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.1	38.0		19.8	9.0	39.2		19.8
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	7.0	34.0		17.0	7.0	34.0		17.0
Max Q Clear Time (g_c+I1), s	6.1	28.0		5.2	4.4	25.8		15.6
Green Ext Time (p_c), s	0.0	4.4		0.3	0.0	5.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Future Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	214	433	43	589	234	1168	45	252	800	1555	214	38
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	436	473	47	532	323	1623	113	515	836	1408	1737	777
Arrive On Green	0.13	0.15	0.15	0.05	0.06	0.06	0.06	0.15	0.15	0.41	0.49	0.49
Sat Flow, veh/h	3442	3254	322	3442	1863	2787	1774	3539	2787	3442	3539	1583
Grp Volume(v), veh/h	214	235	241	589	234	1168	45	252	800	1555	214	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1806	1721	1863	1393	1774	1770	1393	1721	1770	1583
Q Serve(g_s), s	6.4	14.4	14.5	17.0	13.6	0.0	2.7	7.2	10.8	45.0	3.6	1.4
Cycle Q Clear(g_c), s	6.4	14.4	14.5	17.0	13.6	0.0	2.7	7.2	10.8	45.0	3.6	1.4
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	257	263	532	323	1623	113	515	836	1408	1737	777
V/C Ratio(X)	0.49	0.91	0.92	1.11	0.72	0.72	0.40	0.49	0.96	1.10	0.12	0.05
Avail Cap(c_a), veh/h	436	257	263	532	373	1697	113	515	836	1408	1737	777
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	44.7	46.3	46.4	52.2	49.3	20.9	49.5	43.2	19.6	32.5	15.2	14.6
Incr Delay (d2), s/veh	0.9	33.6	34.7	62.3	3.1	0.7	2.3	3.3	22.3	52.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	9.4	9.8	12.7	7.3	16.1	1.4	3.8	6.7	31.7	1.8	0.6
LnGrp Delay(d),s/veh	45.6	79.9	81.1	114.5	52.4	21.7	51.7	46.5	41.9	85.4	15.2	14.7
LnGrp LOS	D	E	F	F	D	C	D	D	D	F	B	B
Approach Vol, veh/h		690			1991			1097			1807	
Approach Delay, s/veh		69.7			52.8			43.3			75.6	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.0	20.0	21.0	20.0	11.0	58.0	17.9	23.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	45.0	16.0	17.0	16.0	7.0	54.0	11.0	22.0
Max Q Clear Time (g_c+I1), s	47.0	12.8	19.0	16.5	4.7	5.6	8.4	15.6
Green Ext Time (p_c), s	0.0	1.6	0.0	0.0	0.0	1.4	0.2	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	60.4
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Future Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1912	812	893	1952	0				967	0	153
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1544	691	688	2381	0				903	0	403
Arrive On Green	0.00	0.14	0.14	0.40	1.00	0.00				0.25	0.00	0.25
Sat Flow, veh/h	0	3632	1583	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1912	812	893	1952	0				967	0	153
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	48.0	48.0	22.0	0.0	0.0				28.0	0.0	8.8
Cycle Q Clear(g_c), s	0.0	48.0	48.0	22.0	0.0	0.0				28.0	0.0	8.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1544	691	688	2381	0				903	0	403
V/C Ratio(X)	0.00	1.24	1.18	1.30	0.82	0.00				1.07	0.00	0.38
Avail Cap(c_a), veh/h	0	1544	691	688	2381	0				903	0	403
HCM Platoon Ratio	1.00	0.33	0.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.1	47.1	33.0	0.0	0.0				41.0	0.0	33.8
Incr Delay (d2), s/veh	0.0	107.7	80.4	134.8	0.2	0.0				50.7	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	46.6	36.5	23.2	0.1	0.0				20.0	0.0	4.1
LnGrp Delay(d),s/veh	0.0	154.7	127.5	167.8	0.2	0.0				91.7	0.0	36.5
LnGrp LOS		F	F	F	A					F		D
Approach Vol, veh/h		2724			2845						1120	
Approach Delay, s/veh		146.6			52.8						84.2	
Approach LOS		F			D						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			26.0	52.0		32.0		78.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			22.0	48.0		28.0		74.0
Max Q Clear Time (g_c+I1), s			24.0	50.0		30.0		2.0
Green Ext Time (p_c), s			0.0	0.0		0.0		33.8

Intersection Summary	
HCM 2010 Ctrl Delay	96.3
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	2529	0	0	2071	634	682	0	1050	0	0	0
Future Volume (veh/h)	253	2529	0	0	2071	634	682	0	1050	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	258	2581	0	0	2113	647	464	0	1320			
Adj No. of Lanes	1	3	0	0	3	1	1	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	242	2866	0	0	1988	619	645	0	1152			
Arrive On Green	0.27	1.00	0.00	0.00	0.78	0.78	0.36	0.00	0.36			
Sat Flow, veh/h	1774	5253	0	0	5253	1583	1774	0	3167			
Grp Volume(v), veh/h	258	2581	0	0	2113	647	464	0	1320			
Grp Sat Flow(s),veh/h/ln	1774	1695	0	0	1695	1583	1774	0	1583			
Q Serve(g_s), s	15.0	0.0	0.0	0.0	43.0	43.0	24.8	0.0	40.0			
Cycle Q Clear(g_c), s	15.0	0.0	0.0	0.0	43.0	43.0	24.8	0.0	40.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	242	2866	0	0	1988	619	645	0	1152			
V/C Ratio(X)	1.07	0.90	0.00	0.00	1.06	1.05	0.72	0.00	1.15			
Avail Cap(c_a), veh/h	242	2866	0	0	1988	619	645	0	1152			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.40	0.40	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.0	0.0	0.0	0.0	12.0	12.0	30.2	0.0	35.0			
Incr Delay (d2), s/veh	38.3	0.4	0.0	0.0	33.5	35.6	6.8	0.0	76.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.8	0.1	0.0	0.0	24.9	23.7	13.3	0.0	29.7			
LnGrp Delay(d),s/veh	78.3	0.4	0.0	0.0	45.5	47.6	36.9	0.0	111.4			
LnGrp LOS	F	A			F	F	D		F			
Approach Vol, veh/h		2839			2760			1784				
Approach Delay, s/veh		7.5			46.0			92.0				
Approach LOS		A			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		44.0		66.0			19.0	47.0
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		40.0		62.0			15.0	43.0
Max Q Clear Time (g_c+I1), s		42.0		2.0			17.0	45.0
Green Ext Time (p_c), s		0.0		40.0			0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.3
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	463	2524	593	279	1941	100	387	116	273	83	75	377
Future Volume (veh/h)	463	2524	593	279	1941	100	387	116	273	83	75	377
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	472	2576	605	285	1981	102	395	118	279	85	77	385
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	491	2358	734	274	2188	541	289	134	318	108	508	870
Arrive On Green	0.55	0.93	0.93	0.15	0.34	0.34	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	926	493	1165	983	1863	1583
Grp Volume(v), veh/h	472	2576	605	285	1981	102	395	0	397	85	77	385
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	926	0	1657	983	1863	1583
Q Serve(g_s), s	27.9	51.0	13.0	17.0	32.4	5.0	26.6	0.0	25.2	4.8	3.4	0.0
Cycle Q Clear(g_c), s	27.9	51.0	13.0	17.0	32.4	5.0	30.0	0.0	25.2	30.0	3.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.70	1.00		1.00
Lane Grp Cap(c), veh/h	491	2358	734	274	2188	541	289	0	452	108	508	870
V/C Ratio(X)	0.96	1.09	0.82	1.04	0.91	0.19	1.37	0.00	0.88	0.78	0.15	0.44
Avail Cap(c_a), veh/h	491	2358	734	274	2214	547	289	0	452	108	508	870
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.27	0.27	0.27	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	4.0	2.6	46.5	34.5	25.5	44.7	0.0	38.3	53.8	30.3	14.8
Incr Delay (d2), s/veh	13.4	44.0	2.2	65.0	5.8	0.2	185.6	0.0	20.8	42.2	0.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.2	27.9	4.8	13.3	15.2	2.2	23.7	0.0	14.1	3.8	1.9	7.3
LnGrp Delay(d),s/veh	37.4	48.0	4.8	111.5	40.3	25.7	230.3	0.0	59.1	95.9	31.0	16.4
LnGrp LOS	D	F	A	F	D	C	F		E	F	C	B
Approach Vol, veh/h		3653			2368			792			547	
Approach Delay, s/veh		39.5			48.2			144.5			30.8	
Approach LOS		D			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		34.0	21.0	55.0		34.0	34.4	41.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		30.0	17.0	51.0		30.0	30.0	38.0
Max Q Clear Time (g_c+I1), s		32.0	19.0	53.0		32.0	29.9	34.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	53.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	47

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1334	2	7	1284	111	0	3	10	37	2	6
Future Vol, veh/h	2	1334	2	7	1284	111	0	3	10	37	2	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1466	2	8	1411	122	0	3	11	41	2	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1533	0	0	1468	0	0	2960	3020	1467	2961	2960	1472
Stage 1	-	-	-	-	-	-	1471	1471	-	1488	1488	-
Stage 2	-	-	-	-	-	-	1489	1549	-	1473	1472	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	434	-	-	460	-	-	9	13	157	~ 9	14	156
Stage 1	-	-	-	-	-	-	158	191	-	155	188	-
Stage 2	-	-	-	-	-	-	155	175	-	158	191	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	434	-	-	460	-	-	7	13	157	~ 7	14	156
Mov Cap-2 Maneuver	-	-	-	-	-	-	7	13	-	~ 7	14	-
Stage 1	-	-	-	-	-	-	157	190	-	154	185	-
Stage 2	-	-	-	-	-	-	144	172	-	144	190	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	105.5	$ 2888.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	13	157	434	-	-	460	-	-	7	156
HCM Lane V/C Ratio	0.254	0.07	0.005	-	-	0.017	-	-	6.122	0.042
HCM Control Delay (s)	$ 358.5	29.6	13.3	-	-	13	-	-	$ 3328.7	29.1
HCM Lane LOS	F	D	B	-	-	B	-	-	F	D
HCM 95th %tile Q(veh)	0.7	0.2	0	-	-	0.1	-	-	6.8	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	890	296	153	752	417	219	343	124	298	274	174
Future Volume (veh/h)	166	890	296	153	752	417	219	343	124	298	274	174
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	175	937	312	161	792	439	231	361	131	314	288	183
Adj No. of Lanes	1	2	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1418	634	194	764	649	264	409	146	302	642	287
Arrive On Green	0.10	0.40	0.40	0.11	0.41	0.41	0.15	0.16	0.16	0.17	0.18	0.18
Sat Flow, veh/h	1774	3539	1583	1774	1863	1583	1774	2557	914	1774	3539	1583
Grp Volume(v), veh/h	175	937	312	161	792	439	231	248	244	314	288	183
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1863	1583	1774	1770	1701	1774	1770	1583
Q Serve(g_s), s	9.8	21.6	14.7	8.9	41.0	22.6	12.7	13.7	14.0	17.0	7.3	10.7
Cycle Q Clear(g_c), s	9.8	21.6	14.7	8.9	41.0	22.6	12.7	13.7	14.0	17.0	7.3	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	177	1418	634	194	764	649	264	283	272	302	642	287
V/C Ratio(X)	0.99	0.66	0.49	0.83	1.04	0.68	0.88	0.88	0.90	1.04	0.45	0.64
Avail Cap(c_a), veh/h	177	1418	634	284	764	649	302	283	272	302	642	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	24.4	22.4	43.6	29.5	24.1	41.7	41.0	41.2	41.5	36.5	37.9
Incr Delay (d2), s/veh	63.4	1.1	0.6	12.5	42.5	2.8	21.9	29.5	33.2	62.9	2.3	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	10.8	6.5	5.0	30.0	10.4	7.8	9.0	9.1	13.6	3.8	5.5
LnGrp Delay(d),s/veh	108.3	25.6	23.0	56.2	72.0	26.9	63.6	70.5	74.4	104.4	38.7	48.2
LnGrp LOS	F	C	C	E	F	C	E	E	E	F	D	D
Approach Vol, veh/h		1424			1392			723			785	
Approach Delay, s/veh		35.2			56.0			69.6			67.2	
Approach LOS		D			E			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	20.0	14.9	44.1	18.9	22.1	14.0	45.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	16.0	16.0	35.0	17.0	16.0	10.0	41.0
Max Q Clear Time (g_c+I1), s	19.0	16.0	10.9	23.6	14.7	12.7	11.8	43.0
Green Ext Time (p_c), s	0.0	0.0	0.2	5.4	0.1	0.7	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.4
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	24
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Future Vol, veh/h	91	293	0	0	145	97	154	1	92	0	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	144	465	0	0	230	154	244	2	146	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	1	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	29.5	23.2	16.2
HCM LOS	D	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1
Vol Left, %	99%	0%	100%	0%	0%
Vol Thru, %	1%	0%	0%	100%	60%
Vol Right, %	0%	100%	0%	0%	40%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	155	92	91	293	242
LT Vol	154	0	91	0	0
Through Vol	1	0	0	293	145
RT Vol	0	92	0	0	97
Lane Flow Rate	246	146	144	465	384
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.528	0.264	0.281	0.84	0.694
Departure Headway (Hd)	7.724	6.501	7.014	6.504	6.501
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	465	549	510	553	553
Service Time	5.504	4.279	4.792	4.282	4.576
HCM Lane V/C Ratio	0.529	0.266	0.282	0.841	0.694
HCM Control Delay	18.9	11.6	12.5	34.8	23.2
HCM Lane LOS	C	B	B	D	C
HCM 95th-tile Q	3	1.1	1.1	8.8	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	869	24	6	498	24	1	2	8	36	4	4
Future Volume (veh/h)	6	869	24	6	498	24	1	2	8	36	4	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	6	915	25	6	524	25	1	2	8	38	4	4
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	11	1104	30	11	1079	51	143	140	151	281	22	151
Arrive On Green	0.01	0.61	0.61	0.01	0.61	0.61	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1774	1805	49	1774	1764	84	300	1464	1583	1229	227	1583
Grp Volume(v), veh/h	6	0	940	6	0	549	3	0	8	42	0	4
Grp Sat Flow(s),veh/h/ln	1774	0	1854	1774	0	1848	1764	0	1583	1455	0	1583
Q Serve(g_s), s	0.1	0.0	16.7	0.1	0.0	6.9	0.0	0.0	0.2	0.9	0.0	0.1
Cycle Q Clear(g_c), s	0.1	0.0	16.7	0.1	0.0	6.9	0.1	0.0	0.2	1.1	0.0	0.1
Prop In Lane	1.00		0.03	1.00		0.05	0.33		1.00	0.90		1.00
Lane Grp Cap(c), veh/h	11	0	1134	11	0	1130	283	0	151	303	0	151
V/C Ratio(X)	0.53	0.00	0.83	0.53	0.00	0.49	0.01	0.00	0.05	0.14	0.00	0.03
Avail Cap(c_a), veh/h	169	0	1682	169	0	1676	764	0	605	713	0	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	0.0	6.4	20.8	0.0	4.5	17.2	0.0	17.2	17.6	0.0	17.2
Incr Delay (d2), s/veh	32.7	0.0	2.3	32.7	0.0	0.3	0.0	0.0	0.1	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	9.1	0.2	0.0	3.5	0.0	0.0	0.1	0.5	0.0	0.0
LnGrp Delay(d),s/veh	53.4	0.0	8.7	53.4	0.0	4.8	17.2	0.0	17.4	17.8	0.0	17.3
LnGrp LOS	D		A	D		A	B		B	B		B
Approach Vol, veh/h		946			555			11			46	
Approach Delay, s/veh		9.0			5.3			17.3			17.8	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.3	29.6		8.0	4.3	29.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	4.0	38.0
Max Q Clear Time (g_c+I1), s		2.2	2.1	18.7		3.1	2.1	8.9
Green Ext Time (p_c), s		0.0	0.0	6.9		0.1	0.0	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	57	224	281	82	247
Future Vol, veh/h	211	57	224	281	82	247
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	229	62	243	305	89	268
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	14.7	14.8	13.1
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	79%	0%	100%
Vol Right, %	0%	100%	21%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	247	268	224	281
LT Vol	82	0	0	224	0
Through Vol	0	0	211	0	281
RT Vol	0	247	57	0	0
Lane Flow Rate	89	268	291	243	305
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.179	0.449	0.488	0.445	0.515
Departure Headway (Hd)	7.241	6.021	6.026	6.575	6.068
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	495	596	597	548	593
Service Time	4.994	3.773	4.07	4.319	3.812
HCM Lane V/C Ratio	0.18	0.45	0.487	0.443	0.514
HCM Control Delay	11.6	13.6	14.7	14.5	15.1
HCM Lane LOS	B	B	B	B	C
HCM 95th-tile Q	0.6	2.3	2.7	2.3	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	906	1	6	861	100	0	2	9	27	1	5
Future Volume (veh/h)	1	906	1	6	861	100	0	2	9	27	1	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	1	996	1	7	946	110	0	2	10	30	1	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	1239	1	13	1101	128	0	152	129	254	6	129
Arrive On Green	0.00	0.67	0.67	0.01	0.67	0.67	0.00	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1774	1861	2	1774	1639	191	0	1863	1583	1340	76	1583
Grp Volume(v), veh/h	1	0	997	7	0	1056	0	2	10	31	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1862	1774	0	1829	0	1863	1583	1415	0	1583
Q Serve(g_s), s	0.0	0.0	18.9	0.2	0.0	21.9	0.0	0.0	0.3	0.9	0.0	0.1
Cycle Q Clear(g_c), s	0.0	0.0	18.9	0.2	0.0	21.9	0.0	0.0	0.3	1.0	0.0	0.1
Prop In Lane	1.00		0.00	1.00		0.10	0.00		1.00	0.97		1.00
Lane Grp Cap(c), veh/h	4	0	1240	13	0	1229	0	152	129	260	0	129
V/C Ratio(X)	0.28	0.00	0.80	0.53	0.00	0.86	0.00	0.01	0.08	0.12	0.00	0.04
Avail Cap(c_a), veh/h	145	0	1826	145	0	1793	0	609	517	605	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.4	0.0	5.9	24.2	0.0	6.2	0.0	20.7	20.8	21.1	0.0	20.7
Incr Delay (d2), s/veh	36.8	0.0	1.7	29.5	0.0	3.0	0.0	0.0	0.3	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	10.0	0.2	0.0	11.6	0.0	0.0	0.1	0.4	0.0	0.1
LnGrp Delay(d),s/veh	61.2	0.0	7.6	53.7	0.0	9.3	0.0	20.7	21.0	21.3	0.0	20.8
LnGrp LOS	E		A	D		A		C	C	C		C
Approach Vol, veh/h		998			1063			12			36	
Approach Delay, s/veh		7.6			9.5			21.0			21.2	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.4	36.6		8.0	4.1	36.9
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	48.0		16.0	4.0	48.0
Max Q Clear Time (g_c+I1), s		2.3	2.2	20.9		3.0	2.0	23.9
Green Ext Time (p_c), s		0.0	0.0	8.7		0.1	0.0	9.0

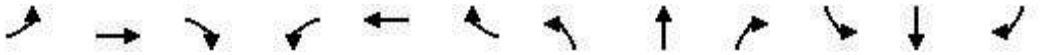
Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	29.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Future Vol, veh/h	96	311	0	0	154	103	164	2	98	0	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	494	0	0	244	163	260	3	156	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	1	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	38.8	27.6	17.7
HCM LOS	E	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1
Vol Left, %	99%	0%	100%	0%	0%
Vol Thru, %	1%	0%	0%	100%	60%
Vol Right, %	0%	100%	0%	0%	40%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	98	96	311	257
LT Vol	164	0	96	0	0
Through Vol	2	0	0	311	154
RT Vol	0	98	0	0	103
Lane Flow Rate	263	156	152	494	408
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.577	0.288	0.304	0.916	0.755
Departure Headway (Hd)	7.887	6.664	7.188	6.677	6.666
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	456	535	497	538	538
Service Time	5.676	4.451	4.977	4.466	4.751
HCM Lane V/C Ratio	0.577	0.292	0.306	0.918	0.758
HCM Control Delay	21	12.2	13.1	46.7	27.6
HCM Lane LOS	C	B	B	E	D
HCM 95th-tile Q	3.6	1.2	1.3	11	6.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	904	25	7	518	25	2	3	9	38	5	5
Future Volume (veh/h)	7	904	25	7	518	25	2	3	9	38	5	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	7	952	26	7	545	26	2	3	9	40	5	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	1129	31	13	1103	53	149	126	145	266	24	145
Arrive On Green	0.01	0.63	0.63	0.01	0.63	0.63	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1774	1805	49	1774	1764	84	368	1373	1583	1198	265	1583
Grp Volume(v), veh/h	7	0	978	7	0	571	5	0	9	45	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1854	1774	0	1848	1741	0	1583	1463	0	1583
Q Serve(g_s), s	0.2	0.0	18.2	0.2	0.0	7.3	0.0	0.0	0.2	1.0	0.0	0.1
Cycle Q Clear(g_c), s	0.2	0.0	18.2	0.2	0.0	7.3	0.1	0.0	0.2	1.2	0.0	0.1
Prop In Lane	1.00		0.03	1.00		0.05	0.40		1.00	0.89		1.00
Lane Grp Cap(c), veh/h	13	0	1160	13	0	1156	275	0	145	290	0	145
V/C Ratio(X)	0.53	0.00	0.84	0.53	0.00	0.49	0.02	0.00	0.06	0.16	0.00	0.03
Avail Cap(c_a), veh/h	163	0	1616	163	0	1610	728	0	581	685	0	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.6	0.0	6.5	21.6	0.0	4.4	18.0	0.0	18.1	18.5	0.0	18.0
Incr Delay (d2), s/veh	29.1	0.0	3.0	29.1	0.0	0.3	0.0	0.0	0.2	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	9.9	0.2	0.0	3.8	0.1	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	50.6	0.0	9.5	50.6	0.0	4.8	18.1	0.0	18.3	18.8	0.0	18.1
LnGrp LOS	D		A	D		A	B		B	B		B
Approach Vol, veh/h		985			578			14			50	
Approach Delay, s/veh		9.8			5.3			18.2			18.7	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.3	31.3		8.0	4.3	31.3
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	4.0	38.0
Max Q Clear Time (g_c+I1), s		2.2	2.2	20.2		3.2	2.2	9.3
Green Ext Time (p_c), s		0.0	0.0	7.1		0.1	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Future Vol, veh/h	154	164	0	0	103	49	294	3	26	0	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	159	169	0	0	106	51	303	3	27	0	0	0
Number of Lanes	1	1	0	0	1	0	0	1	1	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.2	11	15.9
HCM LOS	B	B	C

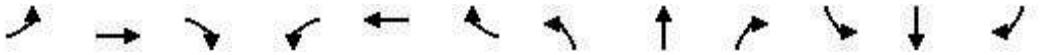
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1
Vol Left, %	99%	0%	100%	0%	0%
Vol Thru, %	1%	0%	0%	100%	68%
Vol Right, %	0%	100%	0%	0%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	297	26	154	164	152
LT Vol	294	0	154	0	0
Through Vol	3	0	0	164	103
RT Vol	0	26	0	0	49
Lane Flow Rate	306	27	159	169	157
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.545	0.039	0.281	0.276	0.258
Departure Headway (Hd)	6.409	5.203	6.376	5.87	5.938
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	563	689	565	614	605
Service Time	4.133	2.927	4.103	3.597	3.969
HCM Lane V/C Ratio	0.544	0.039	0.281	0.275	0.26
HCM Control Delay	16.6	8.1	11.6	10.8	11
HCM Lane LOS	C	A	B	B	B
HCM 95th-tile Q	3.3	0.1	1.1	1.1	1

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	224	61	237	298	87	261
Future Vol, veh/h	224	61	237	298	87	261
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	243	66	258	324	95	284
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	15.9	16.1	13.9
HCM LOS	C	C	B

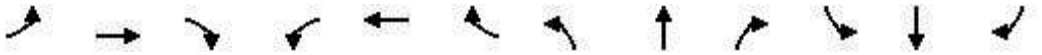
Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	79%	0%	100%
Vol Right, %	0%	100%	21%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	87	261	285	237	298
LT Vol	87	0	0	237	0
Through Vol	0	0	224	0	298
RT Vol	0	261	61	0	0
Lane Flow Rate	95	284	310	258	324
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.194	0.485	0.529	0.479	0.557
Departure Headway (Hd)	7.371	6.15	6.145	6.698	6.19
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	486	584	585	536	583
Service Time	5.129	3.907	4.198	4.452	3.943
HCM Lane V/C Ratio	0.195	0.486	0.53	0.481	0.556
HCM Control Delay	11.9	14.6	15.9	15.5	16.5
HCM Lane LOS	B	B	C	C	C
HCM 95th-tile Q	0.7	2.6	3.1	2.6	3.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	942	2	7	895	104	0	3	10	29	2	6
Future Volume (veh/h)	2	942	2	7	895	104	0	3	10	29	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	2	1035	2	8	984	114	0	3	11	32	2	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	1266	2	15	1127	131	0	145	123	236	11	123
Arrive On Green	0.00	0.68	0.68	0.01	0.69	0.69	0.00	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1774	1859	4	1774	1639	190	0	1863	1583	1290	139	1583
Grp Volume(v), veh/h	2	0	1037	8	0	1098	0	3	11	34	0	7
Grp Sat Flow(s),veh/h/ln	1774	0	1862	1774	0	1829	0	1863	1583	1429	0	1583
Q Serve(g_s), s	0.1	0.0	20.7	0.2	0.0	24.2	0.0	0.1	0.3	1.0	0.0	0.2
Cycle Q Clear(g_c), s	0.1	0.0	20.7	0.2	0.0	24.2	0.0	0.1	0.3	1.1	0.0	0.2
Prop In Lane	1.00		0.00	1.00		0.10	0.00		1.00	0.94		1.00
Lane Grp Cap(c), veh/h	4	0	1268	15	0	1257	0	145	123	247	0	123
V/C Ratio(X)	0.51	0.00	0.82	0.54	0.00	0.87	0.00	0.02	0.09	0.14	0.00	0.06
Avail Cap(c_a), veh/h	138	0	1735	138	0	1705	0	579	492	576	0	492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	5.9	25.4	0.0	6.3	0.0	21.9	22.1	22.4	0.0	22.0
Incr Delay (d2), s/veh	78.1	0.0	2.3	26.8	0.0	4.1	0.0	0.1	0.3	0.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	10.9	0.2	0.0	13.3	0.0	0.0	0.2	0.5	0.0	0.1
LnGrp Delay(d),s/veh	103.8	0.0	8.2	52.3	0.0	10.4	0.0	22.0	22.4	22.7	0.0	22.2
LnGrp LOS	F		A	D		B		C	C	C		C
Approach Vol, veh/h		1039			1106			14			41	
Approach Delay, s/veh		8.4			10.7			22.3			22.6	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	4.4	39.1		8.0	4.1	39.4
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	48.0		16.0	4.0	48.0
Max Q Clear Time (g_c+I1), s		2.3	2.2	22.7		3.1	2.1	26.2
Green Ext Time (p_c), s		0.0	0.0	9.1		0.1	0.0	9.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	318	0	0	156	105	216	2	99	0	0	0
Future Volume (veh/h)	113	318	0	0	156	105	216	2	99	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1900	1900	1863	1863			
Adj Flow Rate, veh/h	179	505	0	0	248	167	343	3	157			
Adj No. of Lanes	1	1	0	0	1	0	0	1	1			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	232	989	0	0	314	211	480	4	432			
Arrive On Green	0.13	0.53	0.00	0.00	0.30	0.30	0.27	0.27	0.27			
Sat Flow, veh/h	1774	1863	0	0	1039	700	1759	15	1583			
Grp Volume(v), veh/h	179	505	0	0	0	415	346	0	157			
Grp Sat Flow(s),veh/h/ln	1774	1863	0	0	0	1739	1775	0	1583			
Q Serve(g_s), s	4.0	7.1	0.0	0.0	0.0	8.9	7.2	0.0	3.3			
Cycle Q Clear(g_c), s	4.0	7.1	0.0	0.0	0.0	8.9	7.2	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		0.40	0.99		1.00			
Lane Grp Cap(c), veh/h	232	989	0	0	0	525	485	0	432			
V/C Ratio(X)	0.77	0.51	0.00	0.00	0.00	0.79	0.71	0.00	0.36			
Avail Cap(c_a), veh/h	435	1461	0	0	0	767	870	0	776			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	17.1	6.2	0.0	0.0	0.0	13.1	13.4	0.0	12.0			
Incr Delay (d2), s/veh	5.4	0.4	0.0	0.0	0.0	3.5	2.0	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.3	3.6	0.0	0.0	0.0	4.8	3.7	0.0	1.5			
LnGrp Delay(d),s/veh	22.5	6.6	0.0	0.0	0.0	16.5	15.4	0.0	12.5			
LnGrp LOS	C	A				B	B		B			
Approach Vol, veh/h		684			415			503				
Approach Delay, s/veh		10.7			16.5			14.5				
Approach LOS		B			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		15.1		25.7			9.3	16.3
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		20.0		32.0			10.0	18.0
Max Q Clear Time (g_c+I1), s		9.2		9.1			6.0	10.9
Green Ext Time (p_c), s		2.0		3.0			0.2	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	27.4
Intersection LOS	D

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	466	44	154	315	31	149
Future Vol, veh/h	466	44	154	315	31	149
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	536	51	177	362	36	171
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	43.7	15.6	12.1
HCM LOS	E	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	91%	0%	100%
Vol Right, %	0%	100%	9%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	31	149	510	154	315
LT Vol	31	0	0	154	0
Through Vol	0	0	466	0	315
RT Vol	0	149	44	0	0
Lane Flow Rate	36	171	586	177	362
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.077	0.313	0.926	0.318	0.6
Departure Headway (Hd)	7.814	6.585	5.686	6.475	5.967
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	458	545	639	554	605
Service Time	5.571	4.341	3.724	4.22	3.712
HCM Lane V/C Ratio	0.079	0.314	0.917	0.319	0.598
HCM Control Delay	11.2	12.3	43.7	12.2	17.3
HCM Lane LOS	B	B	E	B	C
HCM 95th-tile Q	0.2	1.3	12.2	1.4	4

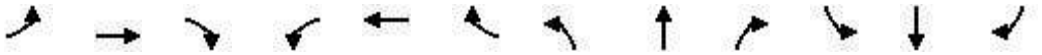
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Future Volume (veh/h)	199	385	40	722	204	995	42	198	468	1349	221	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	224	433	45	811	229	1118	47	222	526	1516	248	40
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	3	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	408	432	45	832	478	1690	251	501	1068	1863	652	554
Arrive On Green	0.12	0.13	0.13	0.08	0.08	0.08	0.14	0.14	0.14	0.35	0.35	0.35
Sat Flow, veh/h	3442	3238	335	3442	1863	2787	1774	3539	2787	5322	1863	1583
Grp Volume(v), veh/h	224	236	242	811	229	1118	47	222	526	1516	248	40
Grp Sat Flow(s),veh/h/ln	1721	1770	1804	1721	1863	1393	1774	1770	1393	1774	1863	1583
Q Serve(g_s), s	7.4	16.0	16.0	28.2	14.1	26.9	2.8	6.9	0.0	31.1	12.0	2.0
Cycle Q Clear(g_c), s	7.4	16.0	16.0	28.2	14.1	26.9	2.8	6.9	0.0	31.1	12.0	2.0
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	408	236	240	832	478	1690	251	501	1068	1863	652	554
V/C Ratio(X)	0.55	1.00	1.01	0.98	0.48	0.66	0.19	0.44	0.49	0.81	0.38	0.07
Avail Cap(c_a), veh/h	408	236	240	832	497	1718	251	501	1068	1863	652	554
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	49.9	52.0	52.0	54.9	47.3	18.0	45.4	47.2	28.1	35.4	29.2	26.0
Incr Delay (d2), s/veh	1.6	58.3	59.9	16.0	0.4	0.4	1.6	2.8	1.6	3.4	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	11.6	12.0	15.3	7.3	18.7	1.5	3.6	6.8	15.7	6.4	0.9
LnGrp Delay(d),s/veh	51.4	110.3	112.0	70.9	47.6	18.4	47.0	50.0	29.7	38.8	30.6	26.2
LnGrp LOS	D	F	F	E	D	B	D	D	C	D	C	C
Approach Vol, veh/h		702			2158			795			1804	
Approach Delay, s/veh		92.1			41.2			36.4			37.4	
Approach LOS		F			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.0	33.0	20.0		46.0	18.2	34.8
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		17.0	29.0	16.0		42.0	13.0	32.0
Max Q Clear Time (g_c+I1), s		8.9	30.2	18.0		33.1	9.4	28.9
Green Ext Time (p_c), s		2.3	0.0	0.0		5.1	0.2	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Future Volume (veh/h)	344	1380	268	181	1953	192	402	141	204	92	98	481
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	378	1516	295	199	2146	211	442	155	224	101	108	529
Adj No. of Lanes	1	3	1	1	4	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	395	1702	530	408	2189	541	405	231	334	203	283	594
Arrive On Green	0.45	0.67	0.67	0.23	0.34	0.34	0.15	0.34	0.34	0.15	0.15	0.15
Sat Flow, veh/h	1774	5085	1583	1774	6408	1583	1774	690	997	1000	1863	1583
Grp Volume(v), veh/h	378	1516	295	199	2146	211	442	0	379	101	108	529
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1602	1583	1774	0	1687	1000	1863	1583
Q Serve(g_s), s	24.7	29.3	7.9	11.7	39.8	12.1	18.0	0.0	23.1	11.6	6.3	11.0
Cycle Q Clear(g_c), s	24.7	29.3	7.9	11.7	39.8	12.1	18.0	0.0	23.1	12.7	6.3	11.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	395	1702	530	408	2189	541	405	0	566	203	283	594
V/C Ratio(X)	0.96	0.89	0.56	0.49	0.98	0.39	1.09	0.00	0.67	0.50	0.38	0.89
Avail Cap(c_a), veh/h	399	1907	594	408	2189	541	405	0	566	203	283	594
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	18.0	6.9	40.1	39.1	30.0	39.6	0.0	34.2	49.0	45.8	15.7
Incr Delay (d2), s/veh	29.1	4.3	0.7	0.9	14.8	0.5	71.7	0.0	6.2	8.5	3.9	18.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.2	13.9	3.4	5.9	19.8	5.3	12.7	0.0	11.7	3.7	3.5	12.7
LnGrp Delay(d),s/veh	61.8	22.3	7.6	41.0	53.9	30.5	111.3	0.0	40.4	57.5	49.6	33.8
LnGrp LOS	E	C	A	D	D	C	F		D	E	D	C
Approach Vol, veh/h		2189			2556			821			738	
Approach Delay, s/veh		27.2			51.0			78.6			39.4	
Approach LOS		C			D			E			D	

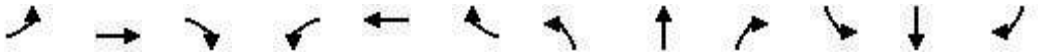
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		44.3	31.6	44.2	22.0	22.3	30.7	45.0
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s		40.0	23.0	45.0	18.0	18.0	27.0	41.0
Max Q Clear Time (g_c+I1), s		25.1	13.7	31.3	20.0	14.7	26.7	41.8
Green Ext Time (p_c), s		2.0	0.3	8.9	0.0	1.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.9
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1187	25	7	794	32	2	3	9	47	5	5
Future Volume (veh/h)	7	1187	25	7	794	32	2	3	9	47	5	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	7	1249	26	7	836	34	2	3	9	49	5	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	1217	25	13	1190	48	58	63	292	79	4	292
Arrive On Green	0.01	0.67	0.67	0.01	0.67	0.67	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	1818	38	1774	1778	72	0	343	1583	0	24	1583
Grp Volume(v), veh/h	7	0	1275	7	0	870	5	0	9	54	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1856	1774	0	1850	343	0	1583	24	0	1583
Q Serve(g_s), s	0.3	0.0	58.0	0.3	0.0	25.4	0.0	0.0	0.4	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.3	0.0	58.0	0.3	0.0	25.4	16.0	0.0	0.4	16.0	0.0	0.2
Prop In Lane	1.00		0.02	1.00		0.04	0.40		1.00	0.91		1.00
Lane Grp Cap(c), veh/h	13	0	1243	13	0	1239	122	0	292	84	0	292
V/C Ratio(X)	0.55	0.00	1.03	0.55	0.00	0.70	0.04	0.00	0.03	0.65	0.00	0.02
Avail Cap(c_a), veh/h	82	0	1243	82	0	1239	122	0	292	84	0	292
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.9	0.0	14.3	42.9	0.0	8.9	29.8	0.0	29.0	42.0	0.0	28.9
Incr Delay (d2), s/veh	32.4	0.0	32.3	32.4	0.0	1.8	0.1	0.0	0.0	15.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	40.2	0.3	0.0	13.4	0.1	0.0	0.2	1.6	0.0	0.1
LnGrp Delay(d),s/veh	75.3	0.0	46.6	75.3	0.0	10.7	30.0	0.0	29.0	57.8	0.0	28.9
LnGrp LOS	E		F	E		B	C		C	E		C
Approach Vol, veh/h		1282			877			14			59	
Approach Delay, s/veh		46.8			11.2			29.3			55.4	
Approach LOS		D			B			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.0	4.6	62.0		20.0	4.6	62.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	58.0		16.0	4.0	58.0
Max Q Clear Time (g_c+I1), s		18.0	2.3	60.0		18.0	2.3	27.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	6.8

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	174	0	0	104	50	335	3	28	0	0	0
Future Volume (veh/h)	206	174	0	0	104	50	335	3	28	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1900	1900	1863	1863			
Adj Flow Rate, veh/h	212	179	0	0	107	52	345	3	29			
Adj No. of Lanes	1	1	0	0	1	0	0	1	1			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	282	832	0	0	186	91	514	4	462			
Arrive On Green	0.16	0.45	0.00	0.00	0.16	0.16	0.29	0.29	0.29			
Sat Flow, veh/h	1774	1863	0	0	1185	576	1759	15	1583			
Grp Volume(v), veh/h	212	179	0	0	0	159	348	0	29			
Grp Sat Flow(s),veh/h/ln	1774	1863	0	0	0	1761	1775	0	1583			
Q Serve(g_s), s	3.5	1.8	0.0	0.0	0.0	2.6	5.3	0.0	0.4			
Cycle Q Clear(g_c), s	3.5	1.8	0.0	0.0	0.0	2.6	5.3	0.0	0.4			
Prop In Lane	1.00		0.00	0.00		0.33	0.99		1.00			
Lane Grp Cap(c), veh/h	282	832	0	0	0	277	518	0	462			
V/C Ratio(X)	0.75	0.22	0.00	0.00	0.00	0.57	0.67	0.00	0.06			
Avail Cap(c_a), veh/h	753	2007	0	0	0	920	1101	0	982			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	12.3	5.2	0.0	0.0	0.0	12.0	9.5	0.0	7.8			
Incr Delay (d2), s/veh	4.0	0.1	0.0	0.0	0.0	1.9	1.5	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.0	0.9	0.0	0.0	0.0	1.4	2.7	0.0	0.2			
LnGrp Delay(d),s/veh	16.3	5.3	0.0	0.0	0.0	13.8	11.1	0.0	7.9			
LnGrp LOS	B	A				B	B		A			
Approach Vol, veh/h		391			159			377				
Approach Delay, s/veh		11.3			13.8			10.8				
Approach LOS		B			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		12.9		17.7			8.9	8.8
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		19.0		33.0			13.0	16.0
Max Q Clear Time (g_c+I1), s		7.3		3.8			5.5	4.6
Green Ext Time (p_c), s		1.7		0.9			0.3	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	22.8
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	312	71	272	360	96	306
Future Vol, veh/h	312	71	272	360	96	306
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	339	77	296	391	104	333
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	27.5	23.1	17.9
HCM LOS	D	C	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	81%	0%	100%
Vol Right, %	0%	100%	19%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	306	383	272	360
LT Vol	96	0	0	272	0
Through Vol	0	0	312	0	360
RT Vol	0	306	71	0	0
Lane Flow Rate	104	333	416	296	391
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.228	0.614	0.758	0.591	0.726
Departure Headway (Hd)	7.879	6.65	6.551	7.193	6.682
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	454	539	550	500	536
Service Time	5.659	4.429	4.624	4.979	4.468
HCM Lane V/C Ratio	0.229	0.618	0.756	0.592	0.729
HCM Control Delay	13	19.5	27.5	20	25.4
HCM Lane LOS	B	C	D	C	D
HCM 95th-tile Q	0.9	4.1	6.7	3.8	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Future Volume (veh/h)	199	403	40	548	218	1086	42	234	744	1446	199	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	214	433	43	589	234	1168	45	252	800	1555	214	38
Adj No. of Lanes	2	2	0	2	1	2	1	2	2	3	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	473	47	626	406	1621	290	579	963	1935	677	576
Arrive On Green	0.11	0.15	0.15	0.30	0.36	0.36	0.16	0.16	0.16	0.36	0.36	0.36
Sat Flow, veh/h	3442	3254	322	3442	1863	2787	1774	3539	2787	5322	1863	1583
Grp Volume(v), veh/h	214	235	241	589	234	1168	45	252	800	1555	214	38
Grp Sat Flow(s),veh/h/ln	1721	1770	1806	1721	1863	1393	1774	1770	1393	1774	1863	1583
Q Serve(g_s), s	6.5	14.4	14.5	18.4	11.1	24.0	2.4	7.1	18.0	28.9	9.1	1.7
Cycle Q Clear(g_c), s	6.5	14.4	14.5	18.4	11.1	24.0	2.4	7.1	18.0	28.9	9.1	1.7
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	375	257	263	626	406	1621	290	579	963	1935	677	576
V/C Ratio(X)	0.57	0.91	0.92	0.94	0.58	0.72	0.16	0.44	0.83	0.80	0.32	0.07
Avail Cap(c_a), veh/h	375	257	263	626	406	1621	290	579	963	1935	677	576
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.56	0.56	0.56	1.00	1.00	1.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	46.5	46.3	46.4	37.7	30.9	11.9	39.5	41.4	33.1	31.5	25.2	22.8
Incr Delay (d2), s/veh	2.0	33.6	34.7	14.9	1.1	0.9	1.1	2.4	8.3	1.8	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	9.4	9.8	9.9	5.8	17.8	1.3	3.6	12.2	14.4	4.7	0.8
LnGrp Delay(d),s/veh	48.6	79.9	81.1	52.6	32.0	12.8	40.6	43.8	41.3	33.3	25.8	22.9
LnGrp LOS	D	E	F	D	C	B	D	D	D	C	C	C
Approach Vol, veh/h		690			1991			1097			1807	
Approach Delay, s/veh		70.6			26.8			41.9			32.2	
Approach LOS		E			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		22.0	24.0	20.0		44.0	16.0	28.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		18.0	20.0	16.0		40.0	12.0	24.0
Max Q Clear Time (g_c+I1), s		20.0	20.4	16.5		30.9	8.5	26.0
Green Ext Time (p_c), s		0.0	0.0	0.0		5.2	0.2	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	36.9
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Future Volume (veh/h)	0	1874	796	875	1913	0	0	0	0	877	0	225
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1912	812	893	1952	0				967	0	153
Adj No. of Lanes	0	3	1	2	2	0				3	0	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1988	619	928	2466	0				1227	0	365
Arrive On Green	0.00	0.78	0.78	0.54	1.00	0.00				0.23	0.00	0.23
Sat Flow, veh/h	0	5253	1583	3442	3632	0				5322	0	1583
Grp Volume(v), veh/h	0	1912	812	893	1952	0				967	0	153
Grp Sat Flow(s),veh/h/ln	0	1695	1583	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	36.4	43.0	27.4	0.0	0.0				18.8	0.0	9.1
Cycle Q Clear(g_c), s	0.0	36.4	43.0	27.4	0.0	0.0				18.8	0.0	9.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1988	619	928	2466	0				1227	0	365
V/C Ratio(X)	0.00	0.96	1.31	0.96	0.79	0.00				0.79	0.00	0.42
Avail Cap(c_a), veh/h	0	1988	619	939	2477	0				1227	0	365
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.33	0.33	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.3	12.0	24.8	0.0	0.0				39.8	0.0	36.1
Incr Delay (d2), s/veh	0.0	5.4	144.3	3.5	0.2	0.0				5.2	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.9	42.3	13.1	0.1	0.0				9.8	0.0	4.3
LnGrp Delay(d),s/veh	0.0	16.7	156.3	28.3	0.2	0.0				45.0	0.0	39.6
LnGrp LOS		B	F	C	A					D		D
Approach Vol, veh/h		2724			2845						1120	
Approach Delay, s/veh		58.3			9.0						44.2	
Approach LOS		E			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			33.6	47.0		29.4		80.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			30.0	43.0		25.0		77.0
Max Q Clear Time (g_c+I1), s			29.4	45.0		20.8		2.0
Green Ext Time (p_c), s			0.3	0.0		1.9		34.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1334	2	7	1284	111	0	3	10	37	2	6
Future Volume (veh/h)	2	1334	2	7	1284	111	0	3	10	37	2	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	2	1466	2	8	1411	122	0	3	11	41	2	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	1538	2	14	1408	122	0	96	81	134	3	81
Arrive On Green	0.00	0.83	0.83	0.01	0.83	0.83	0.00	0.05	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1774	1860	3	1774	1691	146	0	1863	1583	1305	64	1583
Grp Volume(v), veh/h	2	0	1468	8	0	1533	0	3	11	43	0	7
Grp Sat Flow(s),veh/h/ln	1774	0	1862	1774	0	1837	0	1863	1583	1368	0	1583
Q Serve(g_s), s	0.1	0.0	68.0	0.5	0.0	88.0	0.0	0.2	0.7	3.2	0.0	0.4
Cycle Q Clear(g_c), s	0.1	0.0	68.0	0.5	0.0	88.0	0.0	0.2	0.7	3.3	0.0	0.4
Prop In Lane	1.00		0.00	1.00		0.08	0.00		1.00	0.95		1.00
Lane Grp Cap(c), veh/h	4	0	1540	14	0	1530	0	96	81	137	0	81
V/C Ratio(X)	0.52	0.00	0.95	0.57	0.00	1.00	0.00	0.03	0.14	0.31	0.00	0.09
Avail Cap(c_a), veh/h	67	0	1551	67	0	1530	0	282	240	278	0	240
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	7.5	52.2	0.0	8.8	0.0	47.6	47.9	49.2	0.0	47.8
Incr Delay (d2), s/veh	80.7	0.0	13.3	31.5	0.0	23.5	0.0	0.1	0.7	1.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	39.1	0.4	0.0	52.5	0.0	0.1	0.3	1.3	0.0	0.2
LnGrp Delay(d),s/veh	133.4	0.0	20.8	83.7	0.0	32.3	0.0	47.8	48.6	50.5	0.0	48.2
LnGrp LOS	F		C	F		F		D	D	D		D
Approach Vol, veh/h		1470			1541			14			50	
Approach Delay, s/veh		20.9			32.6			48.4			50.2	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.4	4.8	91.4		9.4	4.2	92.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	88.0		16.0	4.0	88.0
Max Q Clear Time (g_c+I1), s		2.7	2.5	70.0		5.3	2.1	90.0
Green Ext Time (p_c), s		0.0	0.0	13.6		0.1	0.0	0.0

Intersection Summary		
HCM 2010 Ctrl Delay		27.3
HCM 2010 LOS		C

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	49	2	185	75
Average Queue (ft)	14	0	59	38
95th Queue (ft)	41	2	128	71
Link Distance (ft)		234	204	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			11	2
Queuing Penalty (veh)			14	4

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	107	118	48	74	84	58
Average Queue (ft)	39	30	23	42	41	29
95th Queue (ft)	72	88	47	64	66	49
Link Distance (ft)	334			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)	0	0			2	0
Queuing Penalty (veh)	0	0			1	0

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	4	57	49	64
Average Queue (ft)	0	23	15	32
95th Queue (ft)	5	51	42	52
Link Distance (ft)	181		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	T	R
Maximum Queue (ft)	91	192	29	264	38	11	69	60
Average Queue (ft)	36	83	3	113	7	2	28	23
95th Queue (ft)	69	157	16	222	26	11	61	50
Link Distance (ft)	791	791	244	421	421		1067	1067
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						270		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	40	113	17	43	74	188	54	26	78	201	50
Average Queue (ft)	13	49	1	16	24	80	12	4	33	88	14
95th Queue (ft)	38	90	9	36	52	159	39	20	67	169	37
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)						0				0	
Queuing Penalty (veh)						0				0	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	104	109	205	253	151	148	168	177	139	125	468	75
Average Queue (ft)	54	57	79	138	69	80	91	104	77	42	229	73
95th Queue (ft)	91	100	156	222	125	133	155	161	123	116	440	82
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)			0							0	34	38
Queuing Penalty (veh)			1							2	139	64

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	387	458	130	61	39
Average Queue (ft)	201	282	22	20	6
95th Queue (ft)	331	423	79	47	24
Link Distance (ft)			860	860	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	201	220	282	234	240	96	164	124	195	125
Average Queue (ft)	97	134	158	148	155	35	80	46	126	55
95th Queue (ft)	176	205	251	218	229	64	131	123	206	127
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)									5	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								0	16	0
Queuing Penalty (veh)								1	33	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	101	87	113	115	206	320	411	169	124	330	125
Average Queue (ft)	41	31	33	38	104	124	202	62	96	301	30
95th Queue (ft)	85	71	75	86	177	250	346	131	173	316	110
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)							0			59	
Queuing Penalty (veh)							0			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									2	55	0
Queuing Penalty (veh)									14	295	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	303	178	201	197	65	205	297	295	377	328	179	144
Average Queue (ft)	167	65	81	79	19	85	150	144	207	164	57	63
95th Queue (ft)	260	147	164	161	47	161	244	259	348	300	130	123
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							0	0	2	1		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	2			1	0	1
Queuing Penalty (veh)						0	2			1	0	2

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	228	178	212	175
Average Queue (ft)	96	58	69	113
95th Queue (ft)	179	133	177	187
Link Distance (ft)	231		201	
Upstream Blk Time (%)	0	0	1	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	5	1		4
Queuing Penalty (veh)	4	4		7

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	LT	R
Maximum Queue (ft)	30	27	17	7	82	36
Average Queue (ft)	2	3	2	0	31	1
95th Queue (ft)	16	17	13	5	66	16
Link Distance (ft)			335		411	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100	100		50		50
Storage Blk Time (%)				0	6	0
Queuing Penalty (veh)				0	0	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	174	283	224	77	109	295	67	146	177	114	168	149
Average Queue (ft)	80	126	77	34	20	151	32	77	58	7	100	55
95th Queue (ft)	150	219	178	62	64	233	57	138	134	52	159	103
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	0	7	0			7		4	0		2	0
Queuing Penalty (veh)	0	9	0			2		7	0		2	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	85	70
Average Queue (ft)	25	29
95th Queue (ft)	62	54
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 611

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	NB	NB
Directions Served	L	LT	R
Maximum Queue (ft)	60	155	63
Average Queue (ft)	12	72	22
95th Queue (ft)	40	123	56
Link Distance (ft)		204	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	275		50
Storage Blk Time (%)		16	0
Queuing Penalty (veh)		4	1

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	62	89	31	84	102	75
Average Queue (ft)	32	17	16	49	35	40
95th Queue (ft)	54	62	41	76	69	65
Link Distance (ft)	334			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)					1	2
Queuing Penalty (veh)					1	1

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	9	58	90	100
Average Queue (ft)	0	27	37	49
95th Queue (ft)	4	56	72	81
Link Distance (ft)	181		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	T	R
Maximum Queue (ft)	112	369	92	427	232	24	262	136
Average Queue (ft)	51	182	36	279	53	1	120	51
95th Queue (ft)	96	467	77	426	146	12	242	103
Link Distance (ft)	791	791	244	421	421		1067	1067
Upstream Blk Time (%)		1		1	0			
Queuing Penalty (veh)		6		3	0			
Storage Bay Dist (ft)						270		
Storage Blk Time (%)							4	
Queuing Penalty (veh)							0	

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	79	199	13	87	233	390	277	30	174	370	222
Average Queue (ft)	33	103	1	30	46	220	75	8	63	191	55
95th Queue (ft)	67	174	7	63	159	392	235	29	158	355	206
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)										3	1
Queuing Penalty (veh)										15	3
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)						9	0			8	
Queuing Penalty (veh)						4	0			8	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	114	122	241	314	115	125	175	165	104	124	427	75
Average Queue (ft)	58	47	79	169	56	63	80	96	54	40	173	71
95th Queue (ft)	100	91	183	272	100	111	144	140	90	97	365	84
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)	0		0							0	30	28
Queuing Penalty (veh)	0		1							0	121	47

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	615	642	386	196	25
Average Queue (ft)	436	500	183	27	5
95th Queue (ft)	734	741	726	129	18
Link Distance (ft)			860	860	
Upstream Blk Time (%)			2		
Queuing Penalty (veh)			10		
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)	1	8	1		
Queuing Penalty (veh)	1	5	7		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	475	499	303	174	166	104	224	125	225	125
Average Queue (ft)	223	273	118	103	104	27	79	114	189	78
95th Queue (ft)	439	465	250	154	153	69	169	161	210	164
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)	0	1	0						61	
Queuing Penalty (veh)	1	3	0						0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								4	64	0
Queuing Penalty (veh)								19	226	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	150	127	153	144	289	339	461	249	125	335	125
Average Queue (ft)	66	49	81	92	70	99	224	40	83	301	62
95th Queue (ft)	121	100	128	131	173	248	427	151	172	317	159
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)					0		1	0		63	
Queuing Penalty (veh)					0		2	1		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									0	58	0
Queuing Penalty (veh)									1	352	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	185	163	240	246	58	208	365	409	469	456	274	144
Average Queue (ft)	82	33	80	90	20	96	192	272	366	332	69	71
95th Queue (ft)	147	96	151	159	47	182	363	503	545	551	227	139
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							1	7	35	26		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	4			14	0	1
Queuing Penalty (veh)						0	5			11	0	2

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	241	99	128	162
Average Queue (ft)	119	38	33	64
95th Queue (ft)	216	80	85	126
Link Distance (ft)	231		201	
Upstream Blk Time (%)	2		0	
Queuing Penalty (veh)	0		0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	10			0
Queuing Penalty (veh)	10			0

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	R
Maximum Queue (ft)	23	142	28	4	28	14	133	29
Average Queue (ft)	1	24	3	0	3	0	42	2
95th Queue (ft)	12	202	16	3	16	7	127	23
Link Distance (ft)		708		791	335		411	
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)	100		100			50		50
Storage Blk Time (%)		3				0	21	0
Queuing Penalty (veh)		0				0	1	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	467	467	250	184	397	124	155	407	314	172	284
Average Queue (ft)	172	429	425	241	59	228	60	136	244	154	120	110
95th Queue (ft)	195	491	502	312	155	368	99	182	460	371	187	243
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		61	60						21			0
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	7	93	80	1		25		44	5	1	12	0
Queuing Penalty (veh)	23	148	225	4		12		151	19	3	16	1

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	188	85
Average Queue (ft)	61	42
95th Queue (ft)	172	73
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1476

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	NB	NB
Directions Served	L	LT	R
Maximum Queue (ft)	58	212	75
Average Queue (ft)	16	66	42
95th Queue (ft)	46	155	76
Link Distance (ft)		204	
Upstream Blk Time (%)		4	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	275		50
Storage Blk Time (%)		17	2
Queuing Penalty (veh)		22	4

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	88	117	48	94	121	72
Average Queue (ft)	39	26	23	46	44	35
95th Queue (ft)	68	82	48	73	81	58
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)		0			2	1
Queuing Penalty (veh)		0			2	1

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	15	57	40	78
Average Queue (ft)	1	27	14	34
95th Queue (ft)	8	55	37	62
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	96	239	29	156	180	90	57
Average Queue (ft)	43	115	2	77	94	45	21
95th Queue (ft)	80	203	14	137	162	78	48
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	47	101	17	57	69	86	111	30	63	218	55
Average Queue (ft)	9	44	1	16	21	32	53	5	27	92	19
95th Queue (ft)	34	83	7	39	50	70	99	22	52	176	46
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)										0	
Queuing Penalty (veh)										0	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	158	172	250	294	156	170	176	150	168	124	507	75
Average Queue (ft)	42	113	92	149	73	88	87	90	105	50	227	73
95th Queue (ft)	137	179	196	254	130	141	146	132	155	127	424	82
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				0								
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)	0	6	0							0	34	41
Queuing Penalty (veh)	0	10	1							2	135	70

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	543	553	293	128	38
Average Queue (ft)	272	344	33	23	7
95th Queue (ft)	489	536	164	81	24
Link Distance (ft)			860	860	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	0	0			

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	170	240	287	233	245	80	154	124	190	125
Average Queue (ft)	98	140	168	146	155	34	76	49	134	62
95th Queue (ft)	160	213	259	210	226	68	133	126	213	140
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)									7	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								0	18	0
Queuing Penalty (veh)								0	37	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	116	77	97	99	207	360	422	161	125	327	125
Average Queue (ft)	45	29	35	40	102	131	215	56	94	300	30
95th Queue (ft)	92	66	72	84	183	281	372	127	171	316	109
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)							0			60	
Queuing Penalty (veh)							0			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	56	0
Queuing Penalty (veh)									12	305	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	284	195	210	209	83	164	344	354	446	437	279	144
Average Queue (ft)	162	60	79	79	21	76	139	143	217	167	53	61
95th Queue (ft)	247	130	153	155	53	135	241	268	375	323	127	133
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							0	0	2	1		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)							1			1	0	1
Queuing Penalty (veh)							2			1	0	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	228	168	198	173
Average Queue (ft)	101	49	74	113
95th Queue (ft)	189	110	182	188
Link Distance (ft)	231		201	
Upstream Blk Time (%)	1	0	2	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	6		0	5
Queuing Penalty (veh)	5		0	7

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	L	LT	LT	R
Maximum Queue (ft)	23	4	29	28	96	29
Average Queue (ft)	2	0	5	3	31	2
95th Queue (ft)	15	3	22	17	71	19
Link Distance (ft)		708		335	411	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100		100			50
Storage Blk Time (%)					7	0
Queuing Penalty (veh)					0	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	312	265	118	139	314	64	152	186	56	169	166
Average Queue (ft)	100	168	112	42	28	157	32	83	59	6	114	58
95th Queue (ft)	193	297	241	106	86	260	54	149	133	43	173	119
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	3	19	1	0		10		7	0		3	0
Queuing Penalty (veh)	7	24	2	0		2		11	0		3	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	74	61
Average Queue (ft)	28	28
95th Queue (ft)	62	53
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 671

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	NB	NB
Directions Served	L	LT	R
Maximum Queue (ft)	48	169	68
Average Queue (ft)	17	72	21
95th Queue (ft)	44	128	54
Link Distance (ft)		204	
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	275		50
Storage Blk Time (%)		16	0
Queuing Penalty (veh)		4	0

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	74	90	31	89	84	72
Average Queue (ft)	35	14	15	48	36	42
95th Queue (ft)	60	57	40	73	68	67
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)					1	2
Queuing Penalty (veh)					1	2

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	13	80	96	116
Average Queue (ft)	0	27	34	50
95th Queue (ft)	6	61	69	87
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	129	572	89	435	452	315	136
Average Queue (ft)	59	242	37	318	336	151	55
95th Queue (ft)	107	578	73	508	511	292	106
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		2		6	10		
Queuing Penalty (veh)		8		35	57		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	104	239	13	98	155	463	461	128	245	453	460
Average Queue (ft)	37	112	1	38	51	238	262	35	109	285	100
95th Queue (ft)	79	188	6	83	180	678	693	170	265	499	341
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)						2	3			7	1
Queuing Penalty (veh)						8	13			40	6
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)						17	20	0	0	27	
Queuing Penalty (veh)						8	5	0	0	26	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	R
Maximum Queue (ft)	150	170	261	318	110	118	184	136	169	125	535	75
Average Queue (ft)	32	98	93	168	57	60	77	72	97	47	239	72
95th Queue (ft)	120	167	229	281	99	106	136	115	144	118	500	85
Link Distance (ft)			363	363	532	532	532	532			884	
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		50
Storage Blk Time (%)	1	7	0							0	37	32
Queuing Penalty (veh)	1	11	1							1	151	55

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	662	675	860	65	24
Average Queue (ft)	567	601	468	23	5
95th Queue (ft)	804	786	1139	49	16
Link Distance (ft)			860	860	
Upstream Blk Time (%)			5		
Queuing Penalty (veh)			31		
Storage Bay Dist (ft)	650	650			225
Storage Blk Time (%)	4	22	1		
Queuing Penalty (veh)	3	15	14		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	502	511	473	200	224	86	247	125	210	125
Average Queue (ft)	215	273	134	108	112	26	85	120	188	79
95th Queue (ft)	407	439	275	167	178	59	194	149	199	165
Link Distance (ft)	532	532	532		458	458	458		172	
Upstream Blk Time (%)	0	0	0						62	
Queuing Penalty (veh)	1	2	0						0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								6	64	0
Queuing Penalty (veh)								24	225	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	150	151	158	147	237	401	470	248	125	338	125
Average Queue (ft)	69	52	80	96	70	98	212	36	93	301	66
95th Queue (ft)	126	112	126	139	165	265	418	127	175	319	162
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	0	0		62	
Queuing Penalty (veh)						0	2	0		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									0	58	0
Queuing Penalty (veh)									2	360	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	235	190	193	223	70	176	398	416	464	460	270	144
Average Queue (ft)	88	41	80	91	22	86	173	247	349	309	61	72
95th Queue (ft)	178	117	147	160	57	157	346	469	526	520	205	142
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							0	4	24	19		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	2			7	0	1
Queuing Penalty (veh)						0	3			5	0	2

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	245	90	135	161
Average Queue (ft)	123	37	36	69
95th Queue (ft)	216	75	82	131
Link Distance (ft)	231		201	
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	9		0	0
Queuing Penalty (veh)	8		0	1

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	WB	NB	NB	SB	SB
Directions Served	TR	L	LT	R	LT	R
Maximum Queue (ft)	193	30	28	8	164	58
Average Queue (ft)	38	3	2	0	50	3
95th Queue (ft)	271	18	13	5	135	27
Link Distance (ft)	708		335		411	
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)		100		50		50
Storage Blk Time (%)	5			0	34	0
Queuing Penalty (veh)	0			0	2	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	468	462	250	185	324	128	155	427	322	174	375
Average Queue (ft)	171	407	389	216	51	193	59	136	235	135	135	140
95th Queue (ft)	199	527	543	341	142	296	103	185	433	347	204	312
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		48	46						11			0
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	6	88	65	1	0	16		43	4	0	23	0
Queuing Penalty (veh)	22	139	184	3	0	8		150	14	1	31	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	300	91
Average Queue (ft)	81	44
95th Queue (ft)	228	76
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1691

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	EB	WB	NB	NB
Directions Served	L	T	TR	LT	R
Maximum Queue (ft)	66	4	14	229	75
Average Queue (ft)	17	0	1	80	45
95th Queue (ft)	49	3	8	186	81
Link Distance (ft)		716	234	204	
Upstream Blk Time (%)				7	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	275				50
Storage Blk Time (%)				20	3
Queuing Penalty (veh)				28	7

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	91	150	45	86	114	72
Average Queue (ft)	42	37	24	46	48	38
95th Queue (ft)	72	107	47	72	87	65
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)		1			3	1
Queuing Penalty (veh)		2			2	2

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	9	65	56	79
Average Queue (ft)	0	28	14	39
95th Queue (ft)	5	57	39	67
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	98	266	38	201	234	110	69
Average Queue (ft)	46	109	5	96	116	46	29
95th Queue (ft)	83	196	25	172	199	88	58
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	40	121	18	56	65	93	119	29	80	235	54
Average Queue (ft)	14	50	2	17	25	34	55	5	28	106	17
95th Queue (ft)	40	94	11	41	56	77	102	22	60	196	42
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)										0	
Queuing Penalty (veh)										0	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	161	174	258	305	130	140	190	150	160	78	216	303
Average Queue (ft)	45	118	106	161	78	87	80	81	96	27	65	114
95th Queue (ft)	145	181	217	269	127	137	150	132	153	60	136	259
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				0								
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	0	6	2							0	1	3
Queuing Penalty (veh)	0	10	3							0	1	13

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	75	64	531	544	137	54	28
Average Queue (ft)	69	52	269	344	24	20	5
95th Queue (ft)	85	76	468	523	111	46	19
Link Distance (ft)					860	860	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	38	8	0	0			
Queuing Penalty (veh)	26	5	0	0			

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	203	246	310	286	291	110	165	124	194	125
Average Queue (ft)	104	142	174	162	166	35	82	46	138	66
95th Queue (ft)	167	214	273	235	239	78	138	121	219	140
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)									7	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								0	20	0
Queuing Penalty (veh)								1	44	1

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	109	92	108	125	278	405	429	178	125	334	125
Average Queue (ft)	43	32	38	38	118	139	223	71	94	301	30
95th Queue (ft)	85	74	83	89	218	295	393	147	172	317	107
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	0			58	
Queuing Penalty (veh)						0	2			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	55	0
Queuing Penalty (veh)									9	317	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	321	143	184	182	62	219	302	358	421	393	204	144
Average Queue (ft)	169	50	73	75	19	95	159	159	236	186	61	63
95th Queue (ft)	262	105	130	141	45	179	262	277	396	333	138	130
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)								0	1	0		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	3			1	0	3
Queuing Penalty (veh)						1	4			1	0	7

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	225	146	216	175
Average Queue (ft)	103	51	76	114
95th Queue (ft)	194	109	188	190
Link Distance (ft)	231		201	
Upstream Blk Time (%)	0	0	1	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	6	0	0	5
Queuing Penalty (veh)	5	0	0	8

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LT	LT
Maximum Queue (ft)	23	12	29	32	112
Average Queue (ft)	2	0	5	4	31
95th Queue (ft)	13	8	22	20	76
Link Distance (ft)		708		335	411
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100		100		
Storage Blk Time (%)				0	10
Queuing Penalty (veh)				0	1

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	174	336	320	152	158	304	68	143	194	119	171	224
Average Queue (ft)	93	165	116	57	27	160	34	82	60	10	107	64
95th Queue (ft)	178	337	286	160	95	270	59	141	142	63	169	153
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		2	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	1	20	5	0		11		5	0		5	0
Queuing Penalty (veh)	3	27	12	0		3		8	1		5	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	100	74
Average Queue (ft)	30	30
95th Queue (ft)	71	58
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 558

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	51	23	187	75
Average Queue (ft)	19	1	84	23
95th Queue (ft)	46	17	148	65
Link Distance (ft)		234	204	
Upstream Blk Time (%)			2	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			23	0
Queuing Penalty (veh)			6	1

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	75	74	95	215	95	70
Average Queue (ft)	34	17	18	76	40	45
95th Queue (ft)	60	59	66	274	87	70
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)				2	2	
Queuing Penalty (veh)				7	0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)				4	1	6
Queuing Penalty (veh)				1	1	4

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	48	95	70	91	94
Average Queue (ft)	4	39	21	36	46
95th Queue (ft)	37	98	154	69	75
Link Distance (ft)	187		340	1067	1067
Upstream Blk Time (%)	0		4		
Queuing Penalty (veh)	0		19		
Storage Bay Dist (ft)		135			
Storage Blk Time (%)		5	0		
Queuing Penalty (veh)		14	0		

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	512	816	119	441	469	852	682
Average Queue (ft)	78	547	44	392	405	431	144
95th Queue (ft)	265	996	98	503	501	934	564
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		8		14	20	5	2
Queuing Penalty (veh)		37		80	116	7	2
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	98	293	94	123	275	815	826	275	245	464	464
Average Queue (ft)	38	132	5	46	89	396	414	57	161	398	193
95th Queue (ft)	74	222	58	96	270	910	916	230	326	543	512
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)		0	0			5	6			23	4
Queuing Penalty (veh)		0	0			27	34			130	24
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)					0	36	41	0	0	55	
Queuing Penalty (veh)					0	17	11	0	0	57	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	154	171	311	311	118	126	168	235	254	98	208	366
Average Queue (ft)	51	117	92	170	53	59	75	79	95	30	65	140
95th Queue (ft)	154	181	232	282	97	101	140	186	200	72	166	294
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	2	9	0							0	6	9
Queuing Penalty (veh)	3	16	1							0	2	34

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	75	63	662	675	891	186	34
Average Queue (ft)	70	50	647	664	737	27	5
95th Queue (ft)	86	79	738	725	1196	124	20
Link Distance (ft)					860	860	
Upstream Blk Time (%)					9		
Queuing Penalty (veh)					61		
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	38	5	5	39	3		
Queuing Penalty (veh)	26	3	4	28	31		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	527	525	344	177	180	85	217	125	218	125
Average Queue (ft)	274	330	132	108	108	25	77	118	190	87
95th Queue (ft)	495	513	254	160	166	62	164	155	204	170
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)	0	1	0						68	
Queuing Penalty (veh)	3	4	0						0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								5	68	0
Queuing Penalty (veh)								21	253	2

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	172	120	134	167	238	410	456	334	125	326	125
Average Queue (ft)	72	51	79	96	72	146	276	51	89	301	67
95th Queue (ft)	131	109	123	143	162	336	487	199	171	315	163
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	1	0		62	
Queuing Penalty (veh)						0	6	1		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	58	0
Queuing Penalty (veh)									6	383	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	231	146	178	194	65	224	448	463	484	470	325	144
Average Queue (ft)	87	41	81	90	20	108	230	351	430	413	131	68
95th Queue (ft)	177	102	143	149	51	215	424	555	527	548	354	132
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							1	10	58	48		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						0	7			22	0	1
Queuing Penalty (veh)						1	9			17	0	4

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	241	124	129	163
Average Queue (ft)	112	38	34	72
95th Queue (ft)	202	86	81	139
Link Distance (ft)	231		201	
Upstream Blk Time (%)	0		0	
Queuing Penalty (veh)	0		0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	7			1
Queuing Penalty (veh)	7			1

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	R
Maximum Queue (ft)	61	547	34	4	28	22	295	52
Average Queue (ft)	2	180	5	0	3	1	93	2
95th Queue (ft)	27	590	24	3	16	10	262	23
Link Distance (ft)		708		791	335		411	
Upstream Blk Time (%)		0					1	
Queuing Penalty (veh)		1					0	
Storage Bay Dist (ft)	100		100			50		50
Storage Blk Time (%)		25				0	46	0
Queuing Penalty (veh)		0				0	3	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	473	470	250	184	350	119	155	440	325	174	396
Average Queue (ft)	170	435	433	244	50	202	59	144	285	201	131	147
95th Queue (ft)	209	482	493	298	137	313	100	183	494	401	198	318
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		72	71						18			0
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	8	92	84	1		17		55	5	1	24	0
Queuing Penalty (veh)	29	153	248	4		9		199	21	4	33	1

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	321	120
Average Queue (ft)	88	46
95th Queue (ft)	229	88
Link Distance (ft)	452	452
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2230

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	80	8	239	76
Average Queue (ft)	24	0	100	47
95th Queue (ft)	60	3	222	86
Link Distance (ft)		234	204	
Upstream Blk Time (%)			17	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			31	3
Queuing Penalty (veh)			42	9

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	92	165	55	89	118	75
Average Queue (ft)	45	43	27	52	48	43
95th Queue (ft)	76	119	49	79	87	71
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)		1			3	2
Queuing Penalty (veh)		2			4	4

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	18	78	64	91
Average Queue (ft)	1	34	18	41
95th Queue (ft)	8	66	48	70
Link Distance (ft)	187		1067	1067
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	121	484	33	332	353	151	83
Average Queue (ft)	58	188	4	169	184	68	38
95th Queue (ft)	106	375	21	301	323	122	72
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		0		0	0		
Queuing Penalty (veh)		0		0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	61	114	22	55	74	134	163	33	214	446	296
Average Queue (ft)	21	49	2	16	27	56	77	6	42	210	50
95th Queue (ft)	50	88	11	40	58	111	134	25	133	400	195
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)										1	0
Queuing Penalty (veh)										7	1
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)										9	
Queuing Penalty (veh)										5	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	156	174	377	386	351	346	202	171	197	124	271	404
Average Queue (ft)	44	124	277	331	197	211	95	80	106	44	125	235
95th Queue (ft)	132	203	418	429	308	310	167	145	180	106	219	381
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)			12	29								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	0	3	24							0	15	14
Queuing Penalty (veh)	0	5	49							0	6	65

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	76	63	662	675	882	367	39
Average Queue (ft)	74	56	619	642	449	52	7
95th Queue (ft)	78	73	735	718	1046	210	24
Link Distance (ft)					860	860	
Upstream Blk Time (%)					2		
Queuing Penalty (veh)					10		
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	47	11	2	12	1		
Queuing Penalty (veh)	47	11	3	14	19		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	395	443	402	226	249	244	329	124	218	125
Average Queue (ft)	196	252	236	140	145	59	121	85	190	96
95th Queue (ft)	323	383	347	204	218	156	238	169	203	169
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)	0	0	0				0		73	
Queuing Penalty (veh)	0	1	1				3		0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)								1	72	1
Queuing Penalty (veh)								7	260	7

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	161	156	260	278	275	394	440	286	125	325	125
Average Queue (ft)	82	49	119	138	151	202	275	135	76	300	41
95th Queue (ft)	142	114	195	217	246	326	388	248	168	313	128
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	0	0		65	
Queuing Penalty (veh)						0	1	0		0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)									1	62	0
Queuing Penalty (veh)									12	463	0

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	328	94	128	141	75	225	451	454	482	476	325	144
Average Queue (ft)	192	23	68	86	19	155	338	378	452	452	216	144
95th Queue (ft)	295	73	114	133	48	274	475	488	470	470	425	147
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							3	5	54	51		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						1	35			33	0	69
Queuing Penalty (veh)						3	64			63	1	239

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	276	193	227	175
Average Queue (ft)	250	69	115	143
95th Queue (ft)	265	150	253	202
Link Distance (ft)	231		201	
Upstream Blk Time (%)	75	0	5	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	19	0	0	12
Queuing Penalty (veh)	76	0	0	22

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	LT	R	LT	R
Maximum Queue (ft)	30	34	29	28	29	166	58
Average Queue (ft)	3	1	5	3	1	59	7
95th Queue (ft)	18	25	22	18	12	148	41
Link Distance (ft)		708		335		411	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		100		50		50
Storage Blk Time (%)		0			0	33	0
Queuing Penalty (veh)		0			0	2	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	471	472	250	184	327	80	152	216	129	174	366
Average Queue (ft)	162	435	431	233	84	201	37	88	67	34	144	129
95th Queue (ft)	227	500	507	326	177	312	66	147	139	84	199	315
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		74	77									1
Queuing Penalty (veh)		0	0									0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	9	94	86	1	0	17		4	1		20	0
Queuing Penalty (veh)	28	124	202	3	0	16		10	2		19	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	298	55
Average Queue (ft)	64	30
95th Queue (ft)	201	52
Link Distance (ft)	452	452
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1932

Intersection: 1: I-15 NB Ramps & Nichols Rd

Movement	EB	WB	NB	NB
Directions Served	L	TR	LT	R
Maximum Queue (ft)	52	279	229	66
Average Queue (ft)	15	100	160	15
95th Queue (ft)	46	285	269	55
Link Distance (ft)		234	204	
Upstream Blk Time (%)		27	48	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (ft)	275			50
Storage Blk Time (%)			67	0
Queuing Penalty (veh)			19	0

Intersection: 2: I-15 SB Ramps & Nichols Rd

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	R	L	T	LT	R
Maximum Queue (ft)	183	136	304	729	170	75
Average Queue (ft)	43	19	34	423	100	59
95th Queue (ft)	109	77	170	952	186	85
Link Distance (ft)	340			716	132	
Upstream Blk Time (%)	0			41	55	
Queuing Penalty (veh)	0			178	0	
Storage Bay Dist (ft)		150	280			50
Storage Blk Time (%)	0	0		55	2	59
Queuing Penalty (veh)	0	1		13	4	45

Intersection: 3: Collier Ave & Nichols Rd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	198	160	358	104	141
Average Queue (ft)	46	113	213	34	53
95th Queue (ft)	172	201	489	75	111
Link Distance (ft)	187		340	1067	1067
Upstream Blk Time (%)	8		46		
Queuing Penalty (veh)	0		291		
Storage Bay Dist (ft)		135			
Storage Blk Time (%)		57	1		
Queuing Penalty (veh)		200	3		

Intersection: 4: Collier Ave - SR-74/Collier Ave & Riverside Dr - SR-74/Riverside Dr

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	LTR	LT	R
Maximum Queue (ft)	638	832	222	444	459	1095	1082
Average Queue (ft)	57	766	109	408	418	960	566
95th Queue (ft)	235	986	232	497	489	1305	1326
Link Distance (ft)	791	791	245	421	421	1067	1067
Upstream Blk Time (%)		37	8	15	20	56	19
Queuing Penalty (veh)		252	0	118	158	94	32
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Collier Ave - SR-74 & Hunco Way

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	150	403	391	369	274	694	717	275	245	470	470
Average Queue (ft)	55	359	262	81	94	379	406	93	124	439	233
95th Queue (ft)	111	474	552	242	279	736	767	298	312	467	568
Link Distance (ft)	467	370	370	370		860	860			421	421
Upstream Blk Time (%)		79	48	0						49	8
Queuing Penalty (veh)		0	0	0						388	62
Storage Bay Dist (ft)					250			250	220		
Storage Blk Time (%)					0	39	49	0	0	77	
Queuing Penalty (veh)					0	24	20	0	0	80	

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	R	L	T	T
Maximum Queue (ft)	162	175	398	402	197	224	172	100	134	124	865	946
Average Queue (ft)	62	137	340	364	102	119	76	45	60	34	283	907
95th Queue (ft)	159	207	463	445	177	197	139	86	111	100	761	928
Link Distance (ft)			363	363	515	515	515	515			885	885
Upstream Blk Time (%)			30	72							0	99
Queuing Penalty (veh)			0	0							0	0
Storage Bay Dist (ft)	150	150							450	100		
Storage Blk Time (%)	0	6	35							0	16	5
Queuing Penalty (veh)	1	12	68							0	7	38

Intersection: 6: Collier Ave/Collier Ave - SR-74 & Central Ave/Central Ave - SR-74

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	R	L	L	T	T	R
Maximum Queue (ft)	76	64	662	675	889	358	23
Average Queue (ft)	75	58	659	673	859	26	3
95th Queue (ft)	76	74	710	695	1032	183	13
Link Distance (ft)					860	860	
Upstream Blk Time (%)					33	0	
Queuing Penalty (veh)					289	0	
Storage Bay Dist (ft)	50	50	650	650			225
Storage Blk Time (%)	70	11	8	61	3		
Queuing Penalty (veh)	82	12	8	61	40		

Intersection: 7: I-15 SB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	565	550	507	337	354	96	252	124	213	125
Average Queue (ft)	492	520	188	230	245	28	110	99	189	66
95th Queue (ft)	618	564	368	354	367	73	188	171	201	155
Link Distance (ft)	515	515	515		458	458	458		172	
Upstream Blk Time (%)	6	13	0		0				73	
Queuing Penalty (veh)	49	111	1		1				0	
Storage Bay Dist (ft)				400				100		100
Storage Blk Time (%)				0	1			5	72	0
Queuing Penalty (veh)				1	6			33	395	2

Intersection: 8: I-15 NB Ramps & Central Ave - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	197	177	238	243	255	407	473	288	125	323	125
Average Queue (ft)	99	56	161	170	137	229	365	115	64	299	61
95th Queue (ft)	169	127	217	217	235	397	476	239	157	311	154
Link Distance (ft)		458	458	458	452	452	452	452		282	
Upstream Blk Time (%)						0	1			64	
Queuing Penalty (veh)						0	7			0	
Storage Bay Dist (ft)	250								100		100
Storage Blk Time (%)		0							0	61	0
Queuing Penalty (veh)		0							0	526	1

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	T	T	T	T	R	L
Maximum Queue (ft)	242	207	275	296	154	225	463	469	483	480	325	145
Average Queue (ft)	138	102	142	148	59	162	297	393	454	453	123	144
95th Queue (ft)	227	166	208	218	118	263	499	540	468	465	343	146
Link Distance (ft)	452	452	452	452	452		436	436	436	436		
Upstream Blk Time (%)							4	12	72	61		
Queuing Penalty (veh)							0	0	0	0		
Storage Bay Dist (ft)						200					300	120
Storage Blk Time (%)						5	16			30	0	62
Queuing Penalty (veh)						26	45			30	0	243

Intersection: 9: Dexter Ave & Central Ave - SR-74

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	282	169	220	174
Average Queue (ft)	248	56	61	112
95th Queue (ft)	261	122	168	185
Link Distance (ft)	231		201	
Upstream Blk Time (%)	75	0	1	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)		175		150
Storage Blk Time (%)	28		0	4
Queuing Penalty (veh)	109		1	7

Intersection: 10: Strickland Ave/Gunnerson St & Riverside Dr - SR-74

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	LT	R	LT	R
Maximum Queue (ft)	37	724	23	14	23	412	45
Average Queue (ft)	1	636	3	1	1	292	3
95th Queue (ft)	19	972	15	9	8	503	25
Link Distance (ft)		708		335		411	
Upstream Blk Time (%)		23				40	
Queuing Penalty (veh)		294				0	
Storage Bay Dist (ft)	100		100		50		50
Storage Blk Time (%)		76			0	96	0
Queuing Penalty (veh)		2			0	6	0

Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	R	L	T	TR	L	T
Maximum Queue (ft)	175	465	460	250	185	444	171	155	422	323	175	498
Average Queue (ft)	136	439	438	217	103	226	61	142	249	188	173	452
95th Queue (ft)	250	455	456	356	193	393	123	181	415	334	178	551
Link Distance (ft)		422	422			708	708		403			452
Upstream Blk Time (%)		85	84						3			85
Queuing Penalty (veh)		0	0						0			0
Storage Bay Dist (ft)	150			225	160			130		300	150	
Storage Blk Time (%)	2	98	95	1	0	16		24	25	1	94	1
Queuing Penalty (veh)	9	162	280	2	3	25		115	126	6	128	2

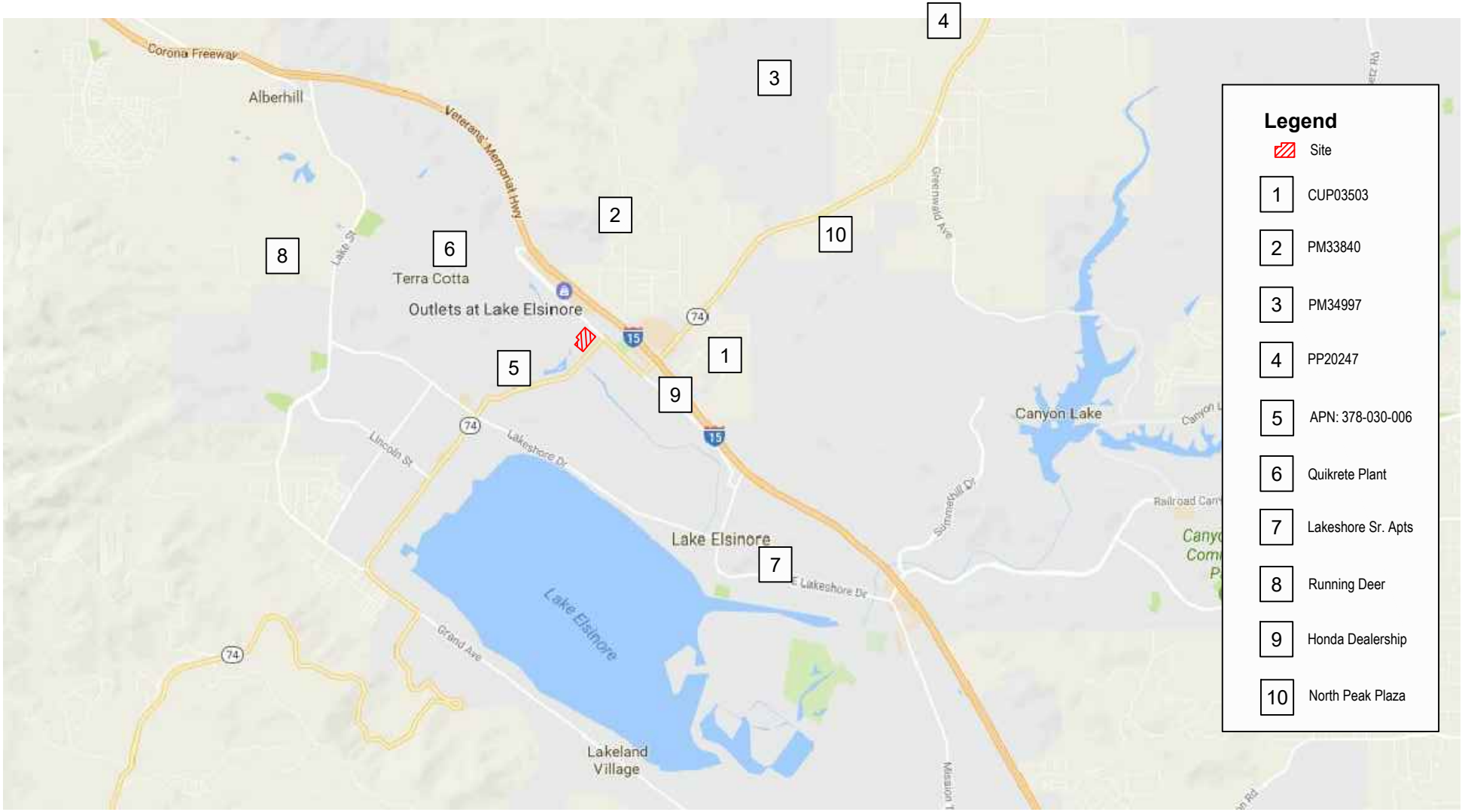
Intersection: 11: Lakeshore Dr & Riverside Dr - SR-74

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	443	76
Average Queue (ft)	126	22
95th Queue (ft)	408	63
Link Distance (ft)	452	452
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 5355

Appendix D: Cumulative Projects Data



Source: Google Maps, 10/2016

Remaining Cumulative Projects Location Map

FIGURE
A

Kassab Travel Center TIA

Project Number	City / County	Project Name	Location	Land Use	Quantity	Units[1]
1	Lake Elsinore	Greenwald	APN 349-290-009. Approximately 200 feet northeast of the intersection of Greenwald and Bella Vista.	Shopping Center	104.450	TSF
2	Lake Elsinore	Ramsgate	1,300 Acre project area. Project is bounded by Riverside Street to the north, La Strada to the South, Greenwald to the east, and Highway 74 to the west.	Single Family Residential	1306.00	DU
				Condos/Townhomes	120.00	DU
3	Lake Elsinore	Trieste (Tract 36624)	Located at Rosetta Canyon Drive, south of Highway 74. APN: 347-120-047-8	Single Family Residential	75	DU
4	Lake Elsinore	Spyglass Ranch	APN's: 377-250-011, 377-350-004, 007, 008, 010, 014, 015, 016, 017, 377-260-004, 005, 006.	Single Family	523	DU
				Condominiums	171	DU
				Shopping Center	145.000	TSF
5	Lake Elsinore	South Shore I (Tract 31593)	Directly west of South Shore II	Single Family	521	DU
		South Shore II (Tract 36567)	East side of I-15 from Main Street adjacent to and east of TTM 35337. APNs: 363-020-012, 363-020-013, 363-020-014, 363-020-014, 363-020-015, 363-020-018, 363-020-002 and 363-020-003	Single Family	400	DU
6	Lake Elsinore	La Strada (Tract 32077)	Aproximately 1,500 feet east of the intersection of La Strada and Summerhill	Single Family	134	DU
7	Lake Elsinore	Marina Village Condos (Tract: 33820).	Spring St.and Lakeshore Dr. APN: 374-271-007,004,013,015,003.	Condominiums	94	DU
8	Lake Elsinore	TAG Property	APN: 363-130-086. Approximately 1,500 feet northwest of the intersection of Diamond and Auto Center.	Car Dealership	50.000	TSF
9	Lake Elsinore	City Center Condos	southeast quadrant ofl-15, Railroad Canyon and Grape	Condominiums	144	DU
10	Lake Elsinore	Diamond Specific Plan	The Project Site consists of 87.2 acres in the southeast portion of the city, generally located along Diamond Drive between Lakeshore Drive and a point approximately 600 feet south of Malaga Road	Condominiums	600	DU
				Hotel	150	RM
				General Office	425.000	TSF
				Shopping Center	472.000	TSF
11	Lake Elsinore	The Colony	East Lake is located in the City of Lake Elsinore along the eastern shore of Lake Elsinore	Apartments	211	DU
		TAG Property		Single Family	2407	DU
				Condominiums	324	DU
		John Laing Homes (Phase 2)		Single Family	506	DU
				Condominiums	1141	DU
				Apartments	308	DU
				Shopping Center	117.000	TSF
12	Lake Elsinore	Lake Elsinore Walmart	Southeast corner of Central and Cambern Avenues. APN's: 377-030-015 & -076 and 377-090-009, & -029 through -032.	Retail	151.397	TSF
				Speciality Retail	5.300	TSF
				Fast-Food without Drive-Thru	5.300	TSF
				Fast-Food without Drive-Thru	6.800	TSF

Project Number	City / County	Project Name	Location	Land Use	Quantity	Units[1]
13	Lake Elsinore	Summerly	East Lake is located in the City of Lake Elsinore along the eastern shore of Lake Elsinore	Single Family	142	DU
14	Lake Elsinore	Beazer		Single Family	72	DU
		KB Homes		Single Family	106	DU
		McMillin Homes		Single Family	143	DU
		Richmond American		Single Family	74	DU
15	Lake Elsinore	Lakeshore Town Center	Located at the northwest corner of Lakeshore Drive and Main Street and is located on Lake Elsinore (APNs: 374-281-001, 002, 003, 004, 005, 006, 007, 008, 009, and 010/374-282-001, 002, 003, and 004/373-162-001, 002, 003, 004, and 005).	Mixed-Use Commercial	237.400	TSF
16	Lake Elsinore	Canyon Hills Estates	APN: 365-220-026; 365-230-001, 005 thru 007, 009 thru 013	Single Family	302	DU
17	Lake Elsinore	Canyon Hills	Generally located east of the intersection of Railroad Canyon and Canyon Hills	Single Family	2700	DU
				Apartments	1575	DU
				Single Family	1003	DU
18	Lake Elsinore	Alberhill Ridge	APN's: 389-020-035 & 036, 389-080-040, 390-130-026 & 028, 390-160-003 & 006, 390-190-013, 014 & 015, 390-200-008 & 010, 390-210-021	Single Family	1056	DU
				Apartments	345	DU
				Shopping Center	679.000	TSF
				General Office	679.000	TSF
19	Lake Elsinore	Alberhill Ranch	APN: 391-800-001, 391-230-009, 391-240-001, 389-020-063, 390-130-021, 390-160-012, 390-190-019, 391-200-012, 391-230-005, 390-170-001, 390-160-001, 390-160-002-390-190-011, 391-230-002, 391-200-007, 391-230-002, 391-200-004, 391-230-004, 390-130-020, 390-130-006, 391-170-005, 391-170-007,391-200-010, 391-200-003, 391-230-010	Single Family	1986	DU
20	Lake Elsinore	Terracina	APNs: 378-040-004, 378-040-005, 378-040-006, 378-040-012, 378-040-012, 389-040-012, 389-180-002, 389-190-002.	Single Family	365	DU
21	Lake Elsinore	Wakerider	APN: 381-030-005	Resort	11.350	TSF
22	Lake Elsinore	Village at Lakeshore (Tract 33267)	APNs:387-180-001, 387-170-004, 387-170-006, 387-080-003, 387-080-004, 379-050-034, 379-050-006.	Condominiums	163	DU
23	Lake Elsinore	Golden Corral	APN: 377-080-059, 377-080-078, 377-080-082	Restaurant	7.798	TSF
24	Lake Elsinore	Circle K	APN: 379-132-013.	Gas Station	4.500	TSF
			Assessor's Parcel Numbers (APNs): 389-020-032, 390-130-006, 390-130-015, 390-130-016, 390-130-017, 390-130-020, 390-130-021, 390-130-024, 390-160-001, 390-160-002, 390-160-011, 390-160-012, 390-170-001, 390-190-011, 390-190-019,	Single Family Residential	8,244	DU
				Non-Residential	4,007.00	TSF

Project Number	City / County	Project Name	Location	Land Use	Quantity	Units[1]
25	Lake Elsinore	Alberhill Villages	391-170-005, 391-170-007, 391-200-003, 391-200-004, 391-200-007, 391-200-010, 391-200-011, 391-200-012, 391-200-017, 391-230-002, 391-230-003, 391-230-004, 391-230-005, 391-230-007, 391-230-009, 391-230-010, 391-240-001, 391-800-011.	University or similar use	6,000	STU
26	Lake Elsinore	Ness Industrial Garage	APN: 377-430-060	Light Industrual	12.000	TSF
27	Lake Elsinore	Fairway Business Park	APN: 377-140-124	Heavy Industrial		
28	Lake Elsinore	La Quinta Inn	APN: 377-090-036	Hotel	64	RM
29	Lake Elsinore	LE Sports Complex	APN: 373-210-378, 389,390, 433 363-161-035-2, 363-161-034-1 363-161-033-0, 363-161-032-9 363-161-031-8, 363-161-030-7, 363-161-029-7, 363-161-032 450	Recreational	525	TSF
30	Lake Elsinore	Central and Collier	APN: 377-080-014; 031; 032; 033; 034;	Commercial	75	TSF
31	Lake Elsinore	Artisan Alley	APN: 365-280-022 & 373-210-041	Commercial	95.1	TSF
32	Lake Elsinore	Quikrete Plant	APN: 378-020-014, 015, & 016	Commercial	163.9	TSF
33	Lake Elsinore	Lakeshore Senior Apartments	APN: 373-176-019, 373-185-022, 023, 036, 037, 038, 046, 024	Apartments	121	DU
34	Lake Elsinore	Southshore (TR 31593)	350-003, 018, 347-360-004 thru 010, and 013	Single Family Residential	521	DU
35	Lake Elsinore	Running Deer (TR 31957)	APN: 391-790-002 & 003	Single Family Residential	101	DU
36	Lake Elsinore	Lakeview Manor	APN: 379-230-001	Condominiums	104	DU
37	Lake Elsinore	Tige Watersports	APN: 378-030-031	Boat dealership	34.5	TSF
38	Lake Elsinore	Kassab Travel Center	APN: 378-030-007 & 009	Gas Station, resturants	17.2	TSF
39	Lake Elsinore	Honda	APN: 377-080-053, 057, 079	Honda dealership	53.4	TSF
40	Lake Elsinore	North Peak Plaza	APN: 347-110-048, 057, 059, 070, 077, and 089	Mixed-Use Commercial	92	TSF

1. TSF= Thousand Square Feet; DU= Dwelling Unit; AC = Acres; STU = Student; RM= Rooms.

APPENDIX G

Traffic Impact Assessment Scoping Agreement

DRAFT

ALBERT WILSON & ASSOCIATES

TRAFFIC ENGINEERS

SCOPING AGREEMENT

FOR

PROPOSED BOAT SALE AND MANUFACTURING FACILITY ON RIVERSIDE DRIVE (APN: 378-030-006)

CITY OF LAKE ELSINORE CA.

Revised June 30, 2017

7866 Henbane Street, Rancho Cucamonga Ca. 91739, Phone:909-483-4876; Fax: 909-989-1576; www.awatraffic.com

TABLE OF CONTENT

- Traffic Impact Study Scoping Agreement
- Trip Generation
- Site Plan
- Trip Distribution

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the Riverside County Transportation Department requirements for traffic impact analysis of the following project. The analysis must follow the Riverside County Transportation Department Traffic Study Guidelines dated February 2005.

Case No. 2016-113
Related Cases -
SP No. *Provide SP No. and list of other approved or active projects within the SP.*
EIR No.
GPA No.
CZ No.
Project Name: Tige Watersports Boat Sales & Manufacturing
Project Address: Riverside Drive (APN: 378-030-006)
Project Description: Boat Manufacturing and Sales Facility

	Consultant	Developer
Name:	Albert Wilson & Associates	Tige Watersports
Address:	7866 Henbane Street	29400 Enterprise Way
	Rancho Cucamonga, Ca. 91739	Lake Elsinore Ca. 92530
Telephone:	909-483-4876	951-245-1222
Fax:	909-989-1576	

A. Trip Generation Source: (ITE 7th Edition or other) ITE 9TH EDITION

Current GP Land Use *Provide General Plan Land Use Designation (e.g.: MDR, CR, etc)* LIMITED INDUSTRIAL
Proposed Land Use
Current Zoning CM
Proposed Zoning CM

Current Trip Generation	In	Out	Total	Proposed Trip Generation In	Out	Total
AM Trips	0	0	0	21	6	27
PM Trips	0	0	0	10	17	27

Internal Trip Allowance ☐ Yes ☒ No (_____ % Trip Discount)
Pass-By Trip Allowance ☐ Yes ☒ No (_____ % Trip Discount)

A passby trip discount of 25% is allowed for appropriate land uses. The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: N 10% S 20% E25% W45%
(attach exhibit for detailed assignment)

C. Background Traffic

Project Build-out Year: 2019 Annual Ambient Growth Rate: 2%
time needed for approvals and construction.
Phase Year(s) NA
Other area projects to be analyzed:

Model/Forecast methodology RELATIVE ADT FACTOR

Exhibit B – Scoping Agreement – Page 2

D. Study intersections: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. NON
2.
3.
4.
5.
6.
7.
8.
9.
10.

E. Study Roadway Segments: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)*

1. NON
2.
3.
4.
5.
6.
7.
8.
9.
10.

E. Other Jurisdictional Impacts

Is this project within a City's Sphere of Influence or one-mile radius of City boundaries? ☐ Yes ☒ No

If so, name of City Jurisdiction: _____

F. Site Plan (please attach reduced copy) ATTACHED

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Transportation Department)
(NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing unsignalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

_____

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.
Date of counts _____

***NOTE* Traffic Study Submittal Form and appropriate fee must be submitted with, or prior to submittal of this form. Transportation Department staff will not process the Scoping Agreement prior to receipt of the fee.**

Recommended by:

CHIDI ONUMONU — 6-30-17
Consultant's Representative — Date

Scoping Agreement Submitted on 5-31-17

Revised on 6-30-17

Approved Scoping Agreement:

[signature] — 7/6/2017
Date

Nicholas Lowe, PE
City Traffic Engineer
• TIA Not Required due to volumes.

TABLE 1:

PROJECT TRIP GENERATION- Boat Manufacturing/Sales Facility

LAND USE	UNITS	A.M. PEAK HOUR			P.M. PEAK HOUR			DAILY		
		IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
PHASE !: Land Use 140- Manufacturing	25.682 TSF									
Trips/Unit		0.57	0.16	0.73	0.26	0.47	0.73	1.91	1.91	3.82
Trips		15	4	19	7	12	19	49	49	98
PHASE 2: Land Use 140- Manafacturing	9.8 TSF	0.57 6	0.16 2	0.73 8	0.26 3	0.47 5	0.73 8	1.91 19	1.91 19	3.82 38
Total New Trips		21	6	27	10	17	27	68	68	136

SUMMARY

EXHIBIT A - LEGAL DESCRIPTION

PORTION OF LOT A IN BLOCK "A" OF RANCHO LA LAGUNA MAP IN BOOK 6 PAGE 377 OF MAPS, SAN DIEGO COUNTY RECORDS, ALSO RECORD OF SURVEY BOOK 74 - PAGE 63, RIVERSIDE COUNTY RECORDS, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

GENERAL INFORMATION

APN NUMBER	379-030-008
TOTAL NET / GROSS LOT AREA	25.76 AC
TOTAL BUILDING AREA	25,682 SF
TOTAL BUILDING COVERAGE	21.2%
TOTAL PAVING AREA	44,142 SF
TOTAL PAVING COVERAGE	12.2%
TOTAL LANDSCAPING AREA	18,488 SF
TOTAL LANDSCAPING COVERAGE	18.2%
EXISTING ZONING	CM
PROPOSED ZONING	CM
TYPE OF CONSTRUCTION	VB
SPRINKLERED OCCUPANCY CLASS	S, S1, F1
DESCRIPTION OF USE: BOAT ENGINEERING, SERVICE, MANUFACTURING	
STORY	1 STORY
HEIGHT	30'-0"
TOTAL PARKING REQUIRED	88 SPACES
TOTAL HC ACCESSIBLE PARKING REQUIRED	3 SPACES
TOTAL PARKING SHOWN	81 SPACES
TOTAL HC ACCESSIBLE PARKING SHOWN	3 SPACES

ALLOWABLE BUILDING AREA

PER CBC TABLE 503: ALLOWABLE BUILDING AREA AND CALCULATION

OCCUPANCY GROUP	S, S1, F1
TYPE OF CONSTRUCTION	TYPE VB
BASIC ALLOWABLE	AT = 9,000 SF
INCREASE FOR SPRINKLER	IS = 3
TOTAL ALLOWABLE BUILDING AREA	AA = AT + (AT X IS) = 9000 + (9000 X 3) = 36,000 SF

UTILITY PURVEYORS

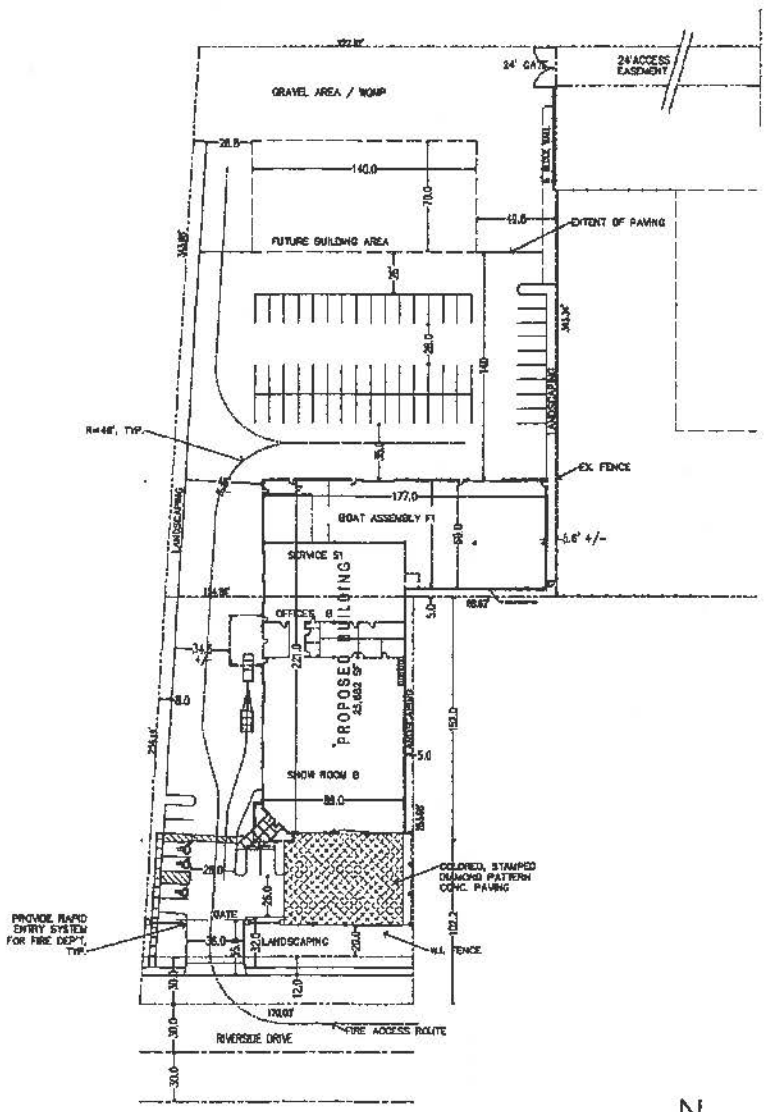
WATER	ELSINORE VALLEY MUNICIPAL WATER DISTRICT, 31,315 CHANEY ST. LAKE ELSINORE, CA 92531 (951) 674-3146
SEWER	ELSINORE VALLEY MUNICIPAL WATER DISTRICT, 31,315 CHANEY ST. LAKE ELSINORE, CA 92531 (951) 674-3146
GAS	SOUTHERN CALIFORNIA GAS COMPANY, P.O. BOX 3003 BEELANDS, CA 92373, (800) 335-7925
TELEPHONE	VERIZON, 120 E. THIRD STREET PERRIS, CA 92570 (951) 657-7612
ELECTRIC	SOUTHERN CALIFORNIA EDISON COMPANY, 26100 MENIFEE RD. ROMOLAND, CA 92380, (951) 639-8533

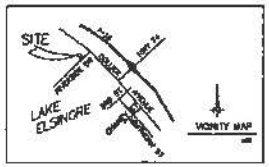
GOVERNING CODES

ALL CODE REFERENCES ARE TO BE IN COMPLIANCE WITH TITLE 24, 2016 EDITION

- PART 1, CALIFORNIA ADMINISTRATION CODE (CAC)
- PART 2, CALIFORNIA BUILDING CODE (CBC)
- PART 3, CALIFORNIA ELECTRICAL CODE (CEC)
- PART 4, CALIFORNIA MECHANICAL CODE (CMC)
- PART 5, CALIFORNIA PLUMBING CODE (CPC)
- PART 6, CALIFORNIA ENERGY EFFICIENCY STANDARDS (CEES)
- PART 9, CALIFORNIA FIRE CODE (CFC)
- PART 11, CALIFORNIA GREEN BUILDING STANDARDS CODE

ALL CODES SHALL INCLUDE LOCAL AMENDMENTS





SITE PLAN / WALL AND FENCE PLAN

FLOOR AREA: 25,682 SF

SCALE: 1"=30'-0"

0 10 20 40 60

EXHIBIT 1

ISSUED

rieger associates
architecture, engineering
40440 Carmelita Circle
Temecula, California 92591
Phone: 951-678-3759

PROJECT NAME: PROTOCOL NEW BUILDING OF tige Watersports

DATE: OCT 20-6
SCALE:
DRAWN:
CHECK:
JOB NO.: 672

C1

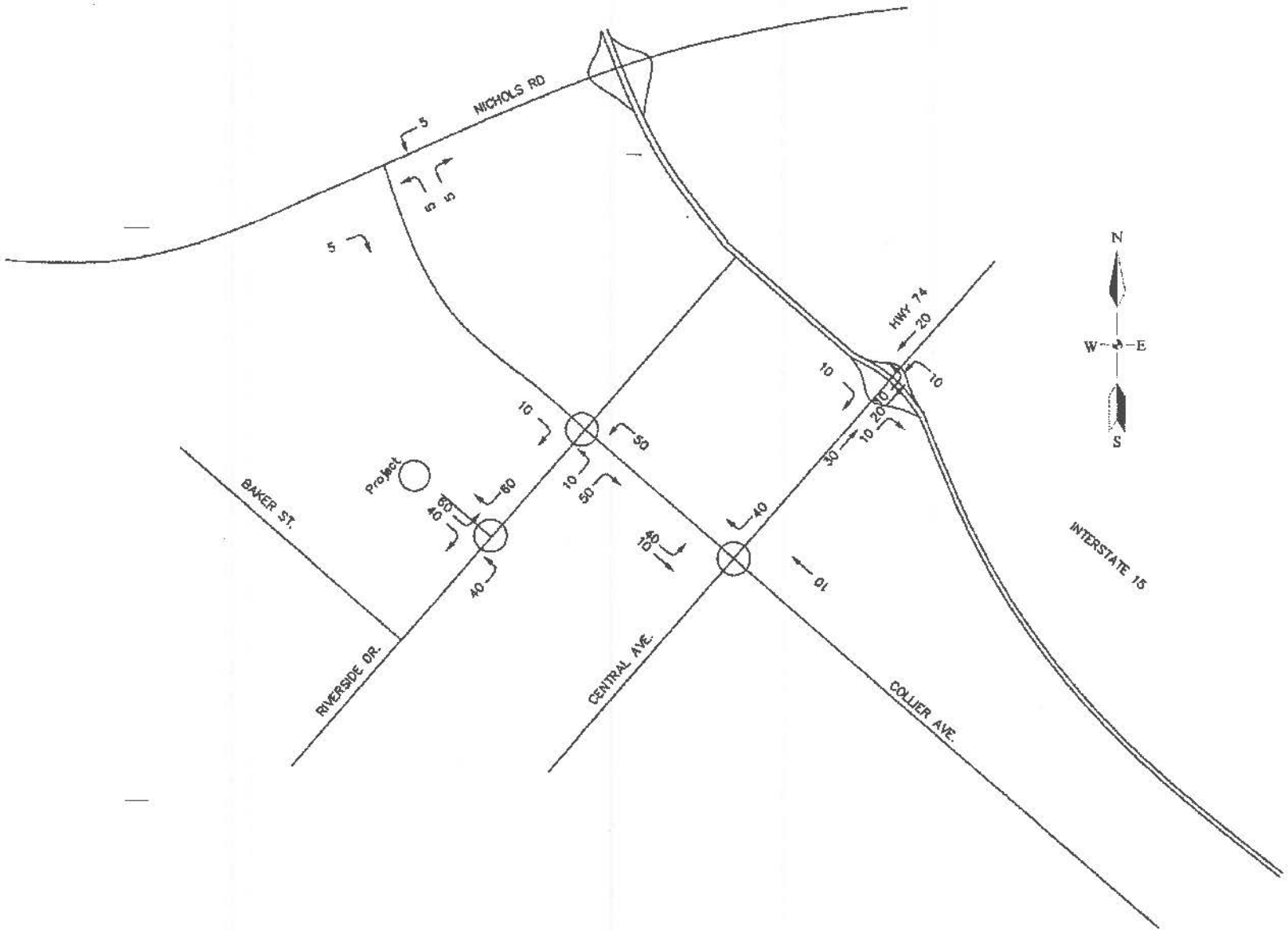


EXHIBIT 2: PROJECT TRIP DISTRIBUTION %

CENTRAL PLAZA
TRAFFIC IMPACT STUDY
City of Lake Elsinore, California
(Updated 2/9/2017)

Prepared for:

PENINSULA RETAIL PARTNERS, LLC.
417 29th Street
Newport Beach, CA 92663

Prepared by:

RK ENGINEERING GROUP, INC.
4000 Westerly Place, Suite 280
Newport Beach, CA 92660

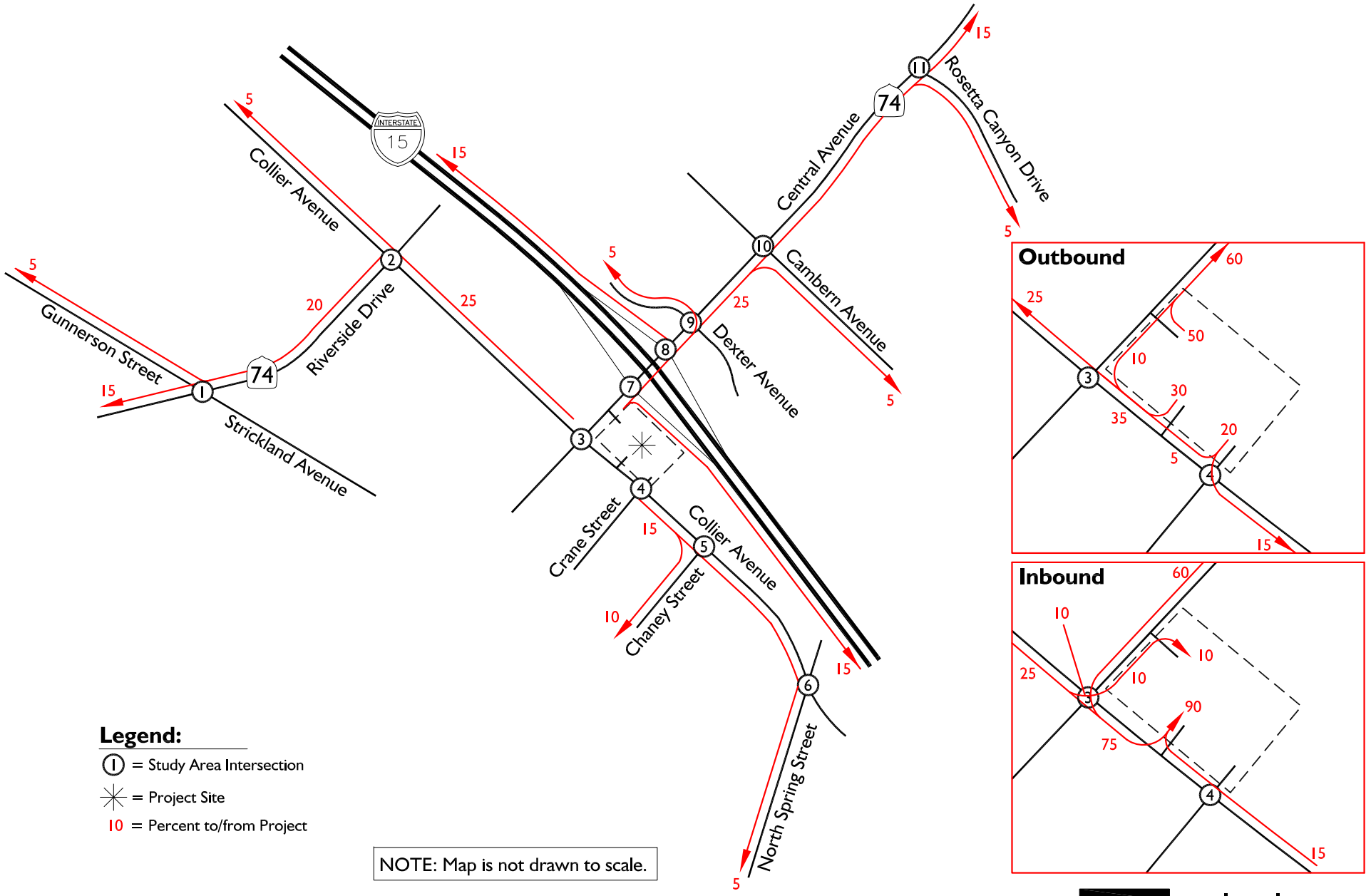
Mohammad "Alex" Tabrizi, PE, TE
Alex Vu, EIT
Jethro Narciso, EIT

February 9, 2017

AT:dt/RK11545.doc
JN:1447-2015-01

Exhibit 5-1

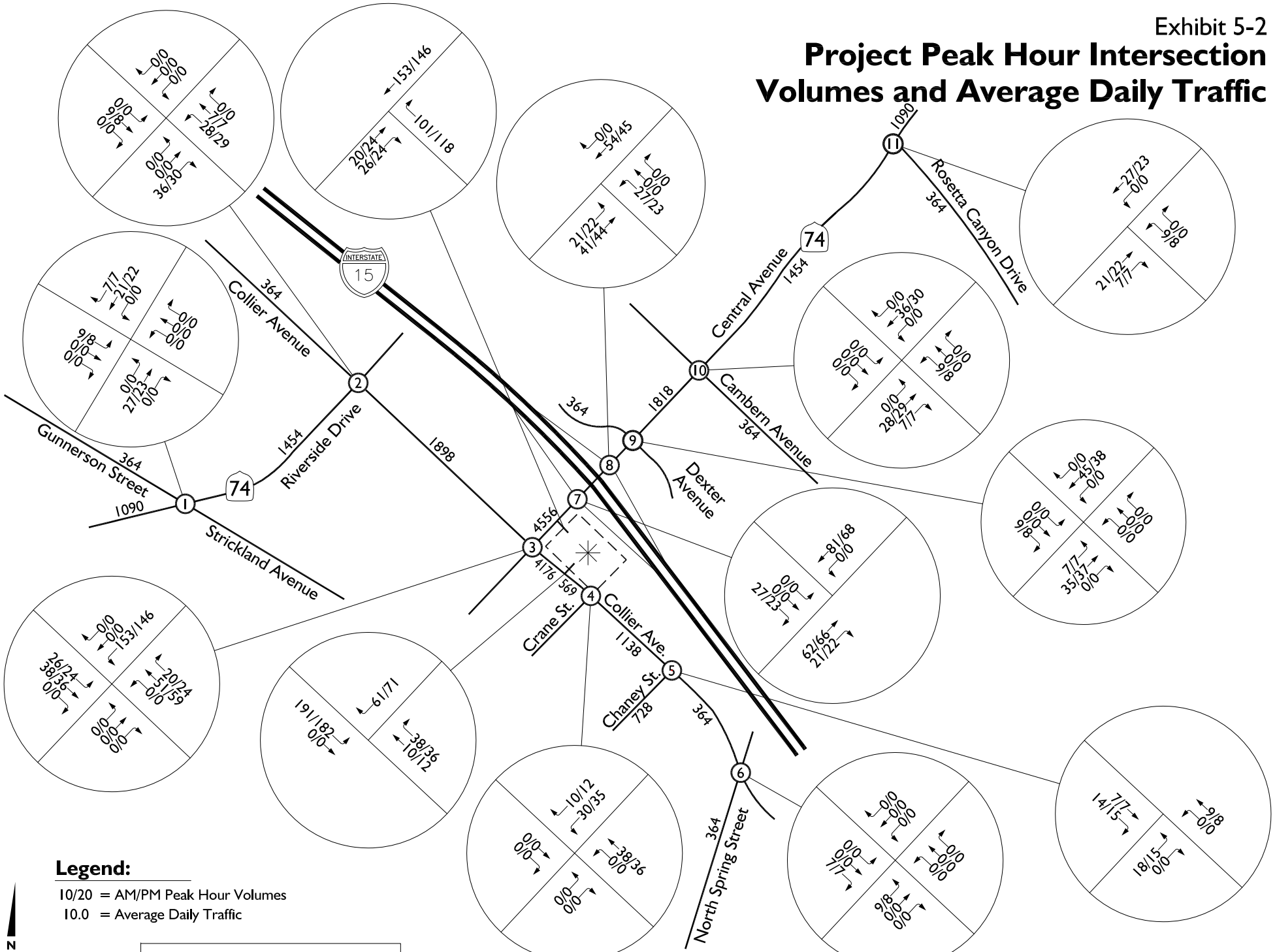
Project Trip Distribution



RK engineering group, inc.

Exhibit 5-2

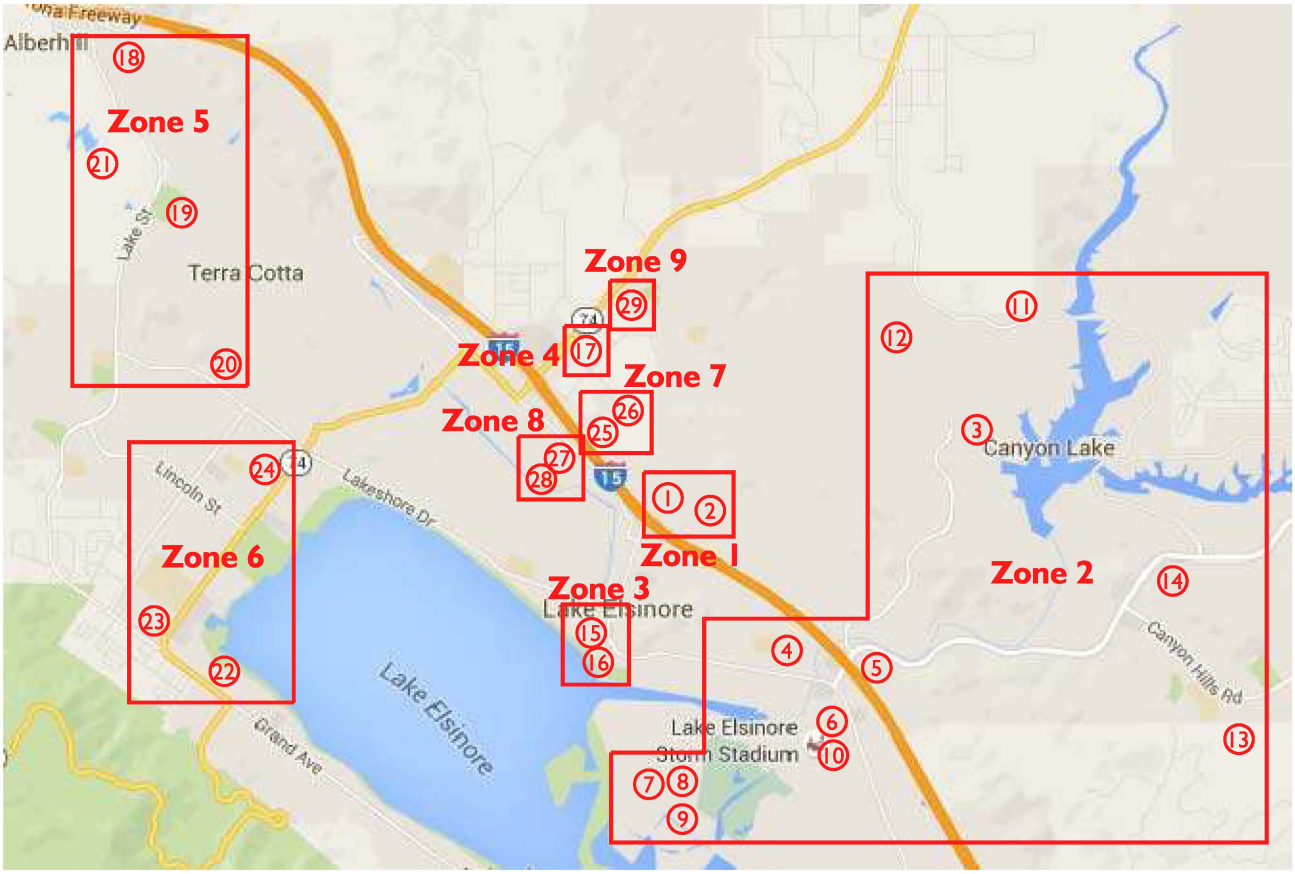
Project Peak Hour Intersection Volumes and Average Daily Traffic



RK engineering group, inc.

Exhibit 5-4

Cumulative Projects Location Map



Zone 1:

(1) = LE4 - Spyglass Ranch
(2) = LE5 - South Shore I & II

Zone 2:

(3) = LE6 - La Strada
(4) = LE8 - TAG Property
(5) = LE9 - City Center Condos
(6) = LE10 - Diamond Specific Plan
(7) = LE11 - The Colony, TAG Property, John Laing Homes (Phase 2)
(8) = LE13 - Summerly
(9) = LE14 - Beazer, KB Homes, McMillin Homes, Richmond American
(10) = LE29 - LE Sports Complex
(11) = LE1 - Greenwald
(12) = LE2 - Ramsgate
(13) = LE16 - Canyon Hills Estates
(14) = LE17 - Canyon Hills

Zone 3:

(15) = LE7 - Marina Village Condos
(16) = LE15 - Lakeshore Town Center

Zone 4:

(17) = LE4 - Lake Elsinore Walmart

Zone 5:

(18) = LE18 - Alberhill Ridge
(19) = LE19 - Alberhill Ranch
(20) = LE20 - Terracina
(21) = LE25 - Alberhill Villages

Zone 6:

(22) = LE21 - Wakerider
(23) = LE22 - Village at Lakeshore (Tract 33267)
(24) = LE24 - Circle K

Zone 7:

(25) = LE23 - Golden Corral
(26) = LE28 - La Quinta Inn

Zone 8:

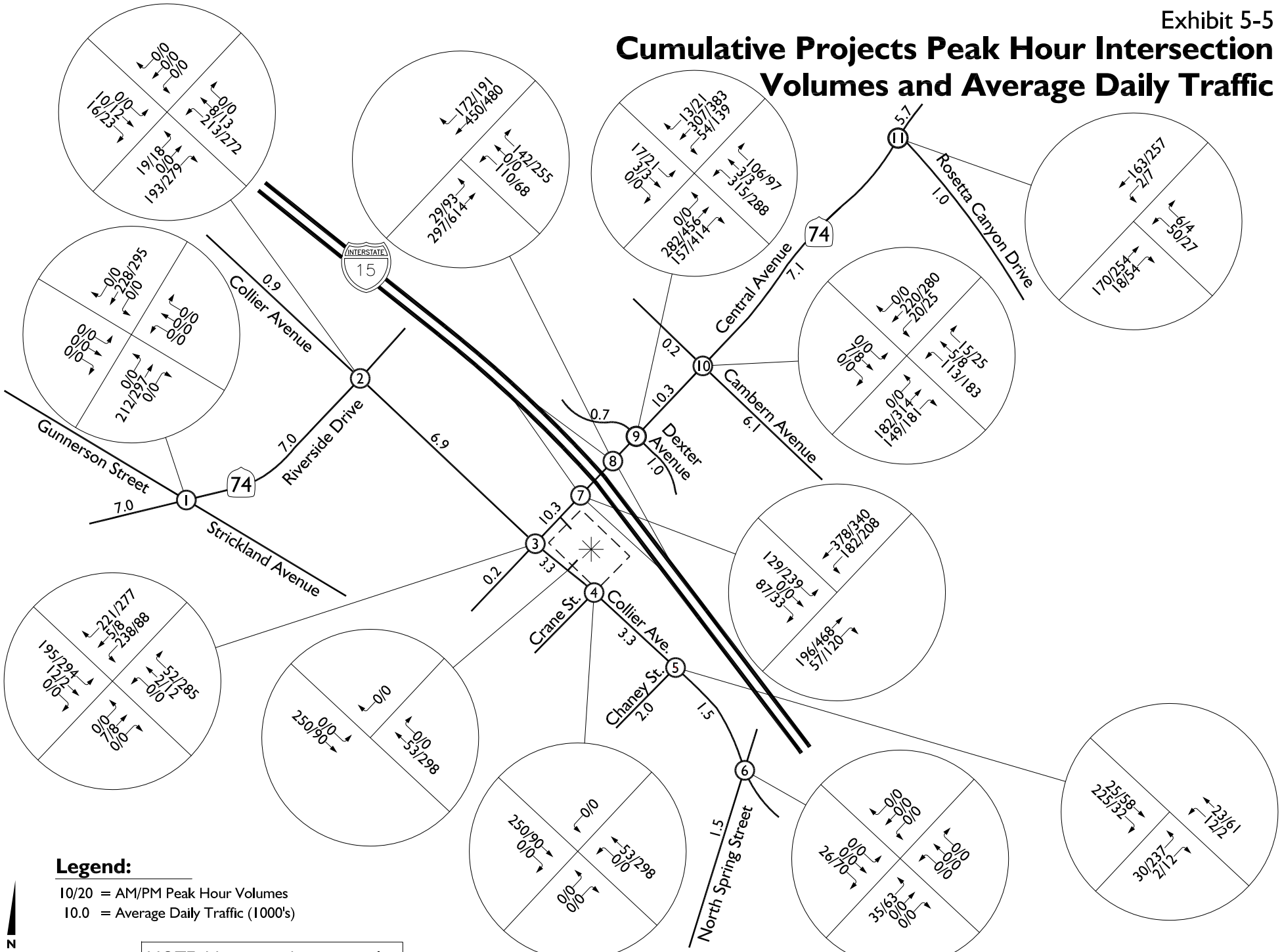
(27) = LE26 - Ness Industrial Garage
(28) = LE27 - Fairway Business Park

Zone 9:

(29) = LE3 - Trieste (Tract 36624)

Exhibit 5-5

Cumulative Projects Peak Hour Intersection Volumes and Average Daily Traffic



Legend:

10/20 = AM/PM Peak Hour Volumes

10.0 = Average Daily Traffic (1000's)

N

NOTE: Map is not drawn to scale.

TABLE 5-1
Trip Generation Rates for Proposed Project

Land Use	ITE Trip Code	Units[2]	Weekday						
			AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Shopping Center	820	TSF	0.60	0.36	0.96	1.78	1.93	3.71	42.70
Fast Food without Drive Thru	933	TSF	26.32	17.55	43.87	13.34	12.81	26.15	716.00
Fast Food with Drive Thru	934	TSF	23.16	22.26	45.42	16.98	15.67	32.65	496.12
High Turnover Sit-Down Restaurant	932	TSF	5.95	4.86	10.81	5.91	3.94	9.85	127.15

[1] Source: Institute of Transportation Engineers (ITE), *Trip Generation, 9th Edition, 2012*

[2] TSF = Thousand Square Feet

TABLE 5-2
Project Trip Generation

Land Use	Quantity	Units	AM			PM			Daily
			In	Out	Total	In	Out	Total	
Shopping Center	53.469	TSF	32	20	52	95	103	198	2,283
Pass-by Adjustment (0% AM & 34% PM) [2]			*0*	*0*	*0*	*-32*	*-35*	*-67*	*-67*
Subtotal - Shopping Center			**32**	**20**	**52**	**63**	**68**	**131**	**2,216**
Fast Food without Drive Thru	3.530	TSF	93	62	155	47	45	92	2,527
Pass-by Adjustment (25% AM & 25% PM) [3]			*-23*	*-16*	*-39*	*-12*	*-11*	*-23*	*-62*
Subtotal - Fast Food without Drive Thru			**70**	**46**	**116**	**35**	**34**	**69**	**2,465**
Fast Food with Drive Thru	4.500	TSF	104	100	204	76	71	147	2,233
Pass-by Adjustment (49% AM 50% PM) [2]			*-51*	*-49*	*-100*	*-38*	*-36*	*-74*	*-174*
Subtotal - Fast Food with Drive Thru			**53**	**51**	**104**	**38**	**35**	**73**	**2,059**
High Turnover Sit-Down Restaurant	4.304	TSF	26	21	47	25	17	42	547
Pass-by Adjustment (0% AM 43% PM) [2]			*0*	*0*	*0*	*-11*	*-7*	*-18*	*-18*
Subtotal - High Turnover Sit-Down Restaurant			**26**	**21**	**47**	**14**	**10**	**24**	**529**
Project Total (before pass-by adjustment)			**255**	**203**	**458**	**243**	**236**	**479**	**7,590**
Project Total (after pass-by adjustment)			***181***	***138***	***319***	***150***	***147***	***297***	***7,269***

[1] TSF = Thousand Square Feet;

[2] Pass-by trip adjustment rates are based on ITE 9th Edition.

[3] Since ITE does not have any pass-by data compiled for this type of land use, this analysis conservatively utilizes a pass-by rate of 25 percent.

TABLE 5-3

Cumulative Projects Trip Generation[2]

Traffic Analysis Zone	#	City of Lake Elsinore Project Number [5]	Project Name	Land Use	Quantity	Units[1]	ITE Code	Peak Hour						Daily
								AM			PM			
								In	Out	Total	In	Out	Total	
1	1	LE 4	Spyglass Ranch	Single Family Residential	523	DU	210	98	294	392	329	194	523	4,979
				Condominiums	171	DU	230	13	62	75	60	29	89	994
				Shopping Center	145.000	TSF	820	86	53	139	258	280	538	6,192
	2	LE 5	South Shore I	Single Family Residential	521	DU	210	98	293	391	328	193	521	4,960
			South Shore II	Single Family Residential	400	DU	210	75	225	300	252	148	400	3,808
							Zone 1 Subtotal	*370*	*927*	*1,297*	*1,227*	*844*	*2,071*	*20,933*
2	3	LE 6	La Strada	Single Family Residential	134	DU	210	25	75	100	84	50	134	1,276
	4	LE 8	TAG Property	Car Dealership	50.000	TSF	841	72	24	96	52	79	131	1,615
	5	LE 9	City Center Condos	Condominiums	144	DU	230	11	53	64	50	25	75	837
	6	LE 10	Diamond Specific Plan	Condominiums	600	DU	230	45	219	264	209	103	312	3,486
				Hotel	150	RM	310	47	33	80	46	44	90	1,226
				General Office	425.000	TSF	710	583	80	663	108	526	634	4,688
				Shopping Center	472.000	TSF	820	281	172	453	841	911	1,752	20,154
	7	LE 11	The Colony	Apartments	211	DU	220	22	86	108	85	46	131	1,403
			TAG Property	Single Family Residential	2407	DU	210	451	1,354	1,805	1,516	891	2,407	22,915
				Condominiums	324	DU	230	24	118	142	113	56	169	1,882
			John Laing Homes (Phase 2)	Single Family Residential	506	DU	210	95	285	380	319	187	506	4,817
				Condominiums	1141	DU	230	85	417	502	398	196	594	6,629
				Apartments	308	DU	220	31	126	157	124	67	191	2,048
				Shopping Center	117.000	TSF	820	70	43	113	208	226	434	4,996
	8	LE 13	Summerly	Single Family Residential	142	DU	210	27	80	107	89	53	142	1,352
	9	LE 14	Beazer	Single Family Residential	72	DU	210	14	41	55	45	27	72	685
			KB Homes	Single Family Residential	106	DU	210	20	60	80	67	39	106	1,009
			McMillin Homes	Single Family Residential	143	DU	210	27	80	107	90	53	143	1,361
			Richmond American	Single Family Residential	74	DU	210	14	42	56	47	27	74	704
	10	LE 29	LE Sports Complex	Recreational	525.000	TSF	495	710	366	1,076	705	734	1,439	17,756
	11	LE 1	Greenwald	Shopping Center	104.450	TSF	820	62	38	100	186	202	388	4,460
	12	LE 2	Ramsgate	Single Family Residential	1306	DU	210	245	735	980	823	483	1,306	12,433
				Condos/Townhomes	120	DU	230	9	44	53	42	21	63	697
	13	LE 16	Canyon Hills Estates	Single Family Residential	302	DU	210	57	170	227	190	112	302	2,875
	14	LE 17	Canyon Hills	Single Family Residential	2700	DU	210	506	1,519	2,025	1,701	999	2,700	25,704
				Apartments	1575	DU	220	161	643	804	635	342	977	10,474
				Single Family Residential	1003	DU	210	188	564	752	632	371	1,003	9,549
							Zone 2 Subtotal	*3,882*	*7,467*	*11,349*	*9,405*	*6,870*	*16,275*	*167,031*
3	15	LE 7	Marina Village Condos	Condominiums	94	DU	230	7	34	41	33	16	49	546
	16	LE 15	Lakeshore Town Center	Mixed-Use Commercial	237.400	TSF	820	141	87	228	423	458	881	10,137
							Zone 3 Subtotal	*148*	*121*	*269*	*456*	*474*	*930*	*10,683*
4	17	LE 12	Lake Elsinore Walmart [5]	Mixed Commercial	170.487	TSF	---	339	256	595	412	417	829	11,723
							Zone 4 Subtotal	*339*	*256*	*595*	*412*	*417*	*829*	*11,723*
5	18	LE 18	Alberhill Ridge	Single Family Residential	1056	DU	210	198	594	792	665	391	1,056	10,053
				Apartments	345	DU	220	35	141	176	139	75	214	2,294
				Shopping Center	679.000	TSF	820	404	248	652	1,209	1,310	2,519	28,993
				General Office	679.000	TSF	710	932	127	1,059	172	840	1,012	7,489
	19	LE 19	Alberhill Ranch	Single Family Residential	1986	DU	210	372	1,117	1,489	1,251	735	1,986	18,907
	20	LE 20	Terracina	Single Family Residential	365	DU	210	68	205	273	230	135	365	3,475
	21	LE 25	Alberhill Villages [3]	All Proposed Land Uses	--	--	--	4,875	5,258	10,133	7,850	7,665	15,515	158,189
							Zone 5 Subtotal	*6,884*	*7,690*	*14,574*	*11,516*	*11,151*	*22,667*	*229,400*
6	22	LE 21	Wakerider [4]	Resort	--	--	--	73	60	133	88	71	159	2,201
	23	LE 22	Village at Lakeshore	Condominiums	163	DU	230	12	60	72	57	28	85	947
	24	LE 24	Circle K	Gas Station/Car Wash	12.000	FP	946	72	70	142	85	81	166	1,834
							Zone 6 Subtotal	*157*	*190*	*347*	*230*	*180*	*410*	*4,982*
7	25	LE 23	Golden Corral	Restaurant	7.798	TSF	932	46	38	84	46	31	77	992
	26	LE 28	La Quinta Inn	Hotel	64	RM	310	20	14	34	20	19	39	523
							Zone 7 Subtotal	*66*	*52*	*118*	*66*	*50*	*116*	*1,515*
8	27	LE 26	Ness Industrial Garage	Light Industrial	12.000	TSF	110	10	1	11	1	10	11	84
	28	LE 27	Fairway Business Park	Light Industrial	280.000	TSF	110	227	31	258	33	239	272	1,952
							Zone 8 Subtotal	*237*	*32*	*269*	*34*	*249*	*283*	*2,036*
9	29	LE 3	Trieste	Single Family Residential	75	DU	210	14	42	56	47	28	75	714
							Zone 9 Subtotal	*14*	*42*	*56*	*47*	*28*	*75*	*714*
							Total Cumulative Project Trip Generation	*12,097*	*16,777*	*28,874*	*23,393*	*20,263*	*43,656*	*449,017*

[1] DU = Dwelling Units; FP = Fueling Positions; RM = Rooms; TSF = Thousand Square Feet

[2] Cumulative project information provided by the City of Lake Elsinore and County of Riverside.

[3] Trip Generation is based on *Alberhill Villages Specific Plan (Linscott, Law & Greenspan Engineers, October 14, 2015).*

[4] Trip Generation is based on *Wakerider Beach Resort Traffic Study (RK Engineering Group, Inc., May 27, 2015)* .

[5] Trip Generation is based on *Lake Elsinore Walmart Traffic Impact Analysis (Urban Crossroads, Inc., June 11, 2015)* .

[6] Project number from City of Lake Elsinore-provided cumulative project list.

TRAFFIC IMPACT ANALYSIS REPORT

MISSION TRAIL APARTMENTS PROJECT

Lake Elsinore, California
March 22, 2017
(Update to the February 23, 2017 Report)

Prepared for:
VCS Environmental
30900 Rancho Viejo Road, Suite 100
San Juan Capistrano, CA 92675

LLG Ref. 2-16-3774-1

Prepared by:
Garrett Milovich
Transportation Engineer II

Under the Supervision of:
Keil D. Maberry, P.E.
Principal

Linscott, Law & Greenspan, Engineers
2 Executive Circle
Suite 250
Irvine, CA 92614
949.825.6175 T
949.825.6173 F
www.llgengineers.com

TABLE 6-2

CUMULATIVE PROJECTS TRIP GENERATION FORECAST[8]

Cumulative Project Description	Daily 2-Way	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
1. Artisan Alley Mixed Use	5,543	135	105	240	283	174	457
2. Walmart Superstore[9]	8,424	166	125	291	280	295	575
3. Pasadena Industrial Park	995	115	16	131	17	122	139
4. Golden Corral Restaurant	736	41	34	75	26	17	43
5. Ness Industrial	91	11	1	12	2	11	13
6. Fairway Business Park	132	15	2	17	2	16	18
7. Air Stream RV Dealership	155	0	0	0	6	10	16
8. La Quinta Inn Hotel	515	19	14	33	19	19	38
9. Central Plaza Shopping Center	2,767	39	23	62	84	92	176
10. Canyon Hills Phase 8	2,649	34	167	201	159	78	237
11. Summerly (McMillan Homes)	4,760	94	281	375	315	185	500
12. Rosetta Canyon Trieste Homes	704	14	42	56	47	27	74
13. Meadowridge II (Pardee)	781	16	46	62	52	30	82
14. Diamond Stadium Indoor Sports Park	1,537	16	0	16	152	59	211
15. Orange Bundy/Parcel Map[10]	1,689	62	60	122	64	60	124
16. Bundy Canyon Plaza	1,421	20	12	32	44	46	90
17. Wal-Mart Retail	8,795	178	138	316	298	312	610
18. Darling/Bundy Canyon Res.	931	14	57	71	57	30	87
Cumulative Projects Trip Generation Potential	**42,625**	**989**	**1,123**	**2,112**	**1,907**	**1,583**	**3,490**

8 Unless otherwise noted; Source: *Trip Generation, 9th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2012).* Where applicable, pass-by adjustment factors were utilized and are reflected in the cumulative projects trip generation potential.

9 Source: *Traffic Impact Analysis Lake Elsinore Walmart*, prepared by Urban Crossroads, dated November 13, 2013.

10 Source: *Traffic Impact Analysis Menifee Town Center*, prepared by Kunzman Associates, Inc., dated May 29, 2012.

Lakeview Manor (PAR 2016-09)
Lakeshore Drive at Gunnerson Street
Lake Elsinore, California 92530

Traffic Impact Analysis
January 9, 2017

Prepared for:

Hong Guan, LLC
14785 Jeffrey Rd #201
Irvine, CA 92618

Prepared by:

LOS Engineering, Inc.
11622 El Camino Real, Suite 100, San Diego, CA 92130
Phone 619-890-1253, Fax 619-374-7247

Job #1627

3.0 Projected Future Traffic

A. PROJECT TRAFFIC

1. AMBIENT GROWTH RATE

An ambient growth rate of 2% per year was applied over two years for a total of 4% to represent an opening year of 2018.

2. TRIP GENERATION

The project trip generation was calculated using the 9th Edition of Institute of Transportation Engineers (ITE) Trip Generation, 2012 (ITE rate sheets are included in **Appendix F**) as shown in **Table 2**.

TABLE 2: PROJECT TRIP GENERATION

ITE Land Use (221)	Trip Rate	Size & Units	ADT	AM Peak Hour				PM Peak Hour			
				Rate	Split	IN	OUT	Rate	Split	IN	OUT
Low-Rise Apts (1-2 floors)	6.59 /Unit	104 Units	**685**	0.46 /Unit	0.21 0.79	**10**	**38**	0.58 /Unit	0.65 0.35	**39**	**21**

Source: *ITE 9th Edition Trip Generation*, 2012. ADT=Average Daily Traffic; Split-percent inbound and outbound.

3. TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution was based on input from City staff with a majority of 75% traveling to/from the east along Lakeshore Dr (toward town) and 25% traveling to/from the west along Lakeshore Dr. The distribution for the project is shown in **Exhibit 6**.

4. OTHER FACTORS AFFECTING TRIP GENERATION

No other trip generation factors are anticipated for the project.

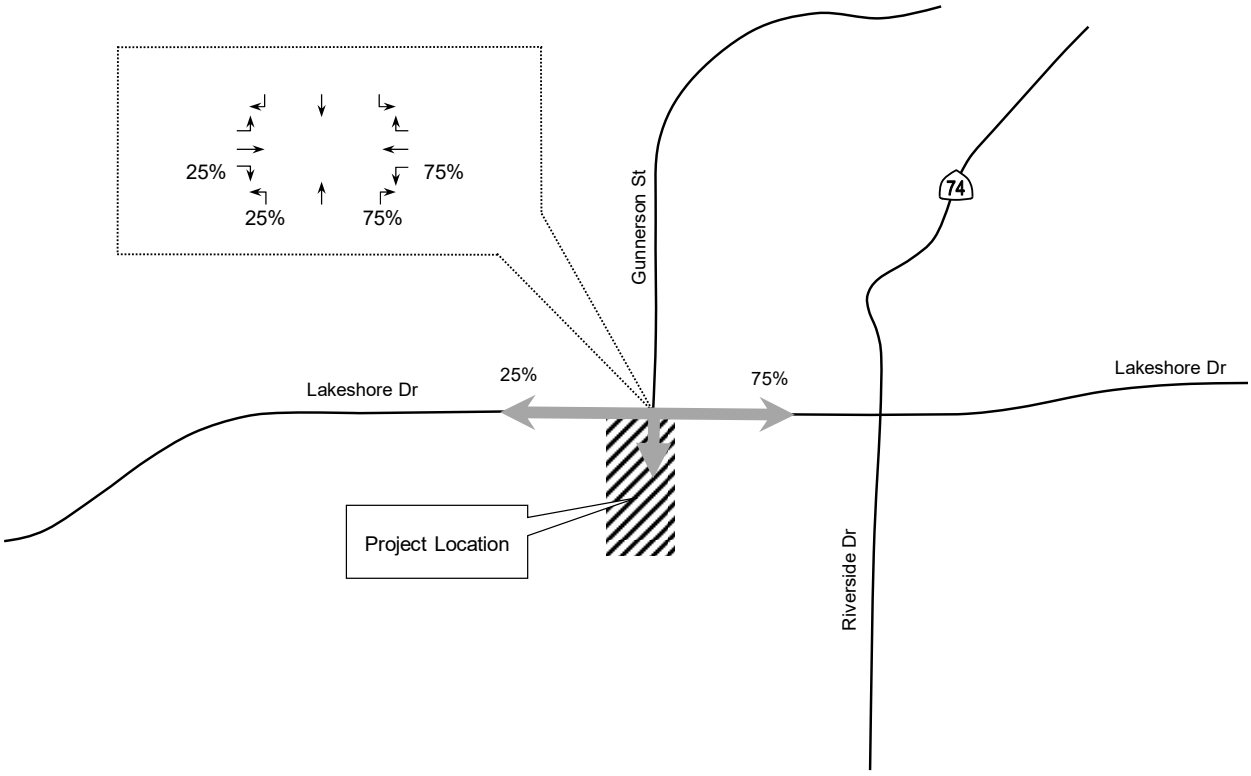
5. PROJECT PEAK HOUR TURNING MOVEMENT TRAFFIC

The project peak hour turning trip assignment is shown in **Exhibit 7**.

6. OTHER FACTORS AFFECTING TRIP GENERATION

No project phasing is planned.

Exhibit 6: Project Trip Distribution



LEGEND

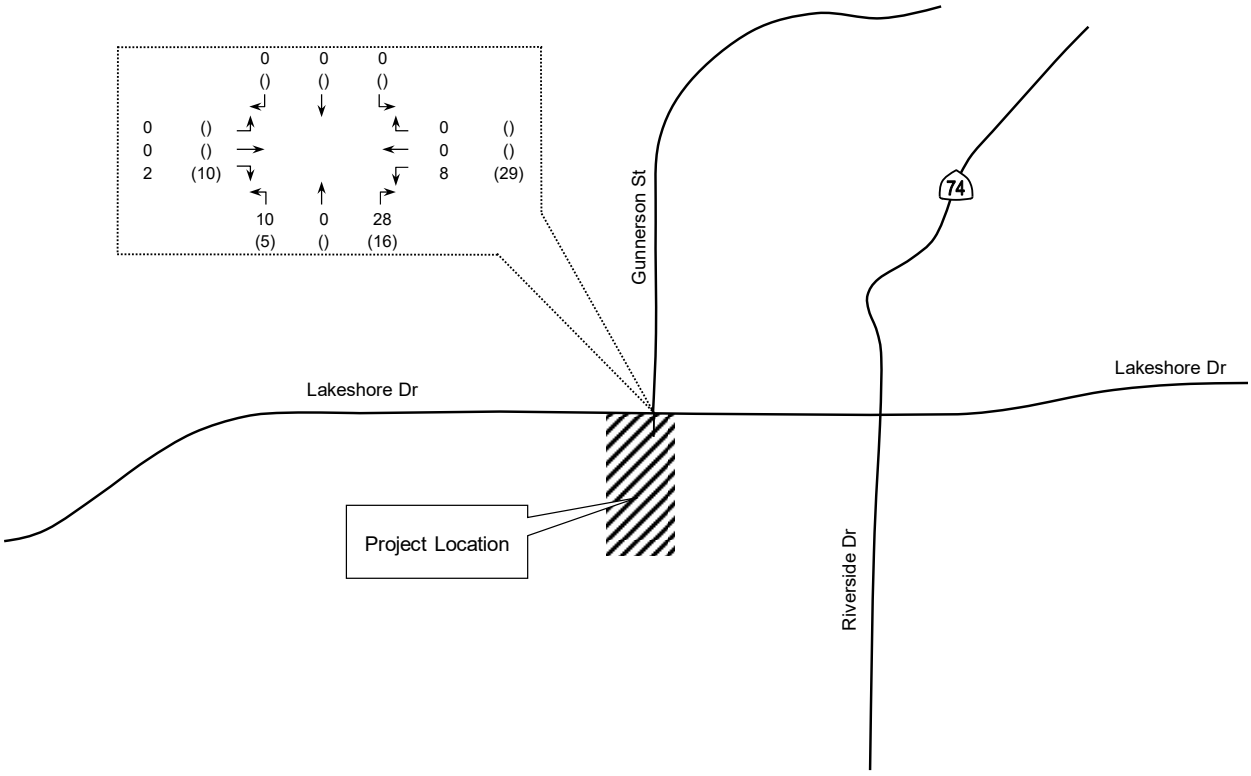
Distribution

Existing Roadways

N

No Scale

Exhibit 7: Project Trip Assignment



LEGEND

XX AM peak hour volumes at intersections

(YY) PM peak hour volumes at intersections
an empty braket ( ) represents a 0 volume

Existing Roadways

N

No Scale

Appendix E:Traffic Signal Warrants

1 - I-15 NB Ramps/Nichols Rd - Existing + Project AM P

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho

*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

10 - Gunnerson/Riverside - Existing + Project AM Peak

1427, 55

SIGNAL WARRANT NOT MET

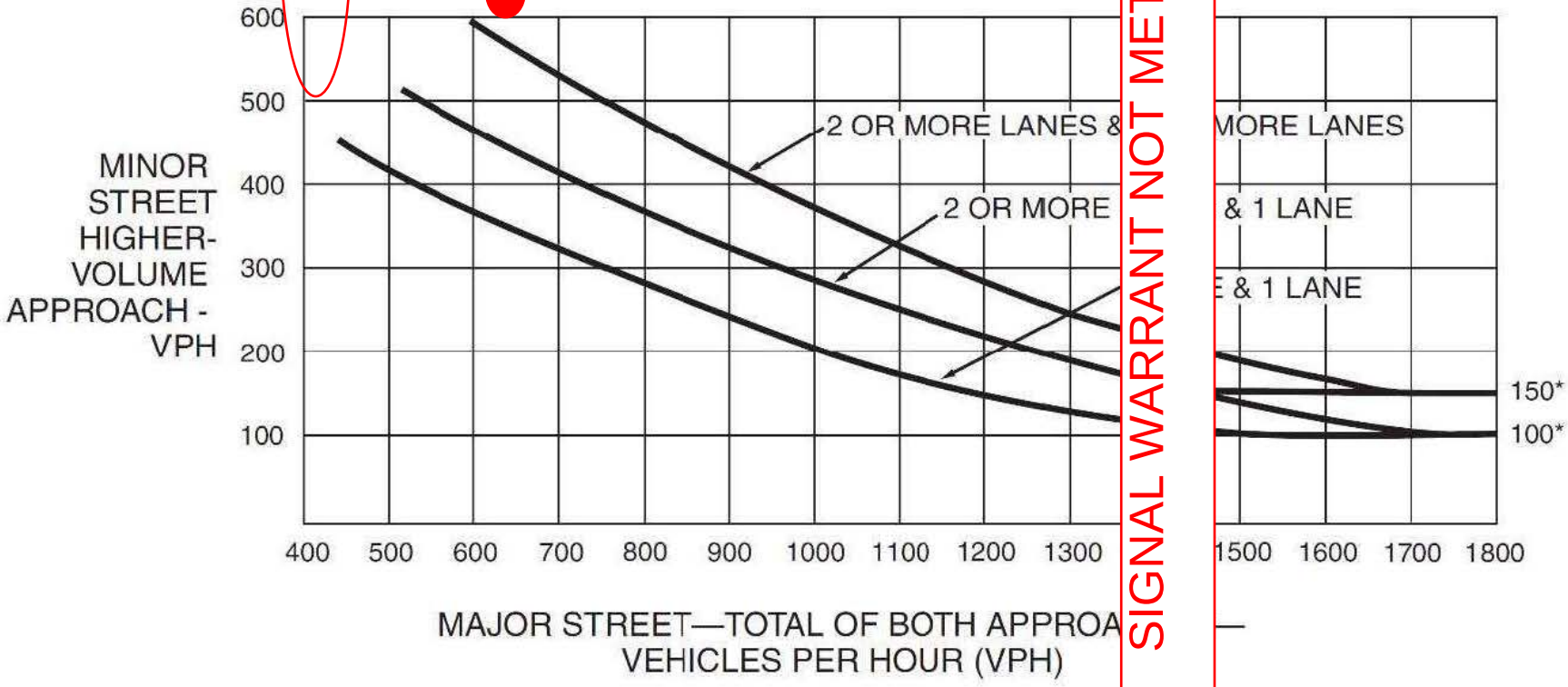


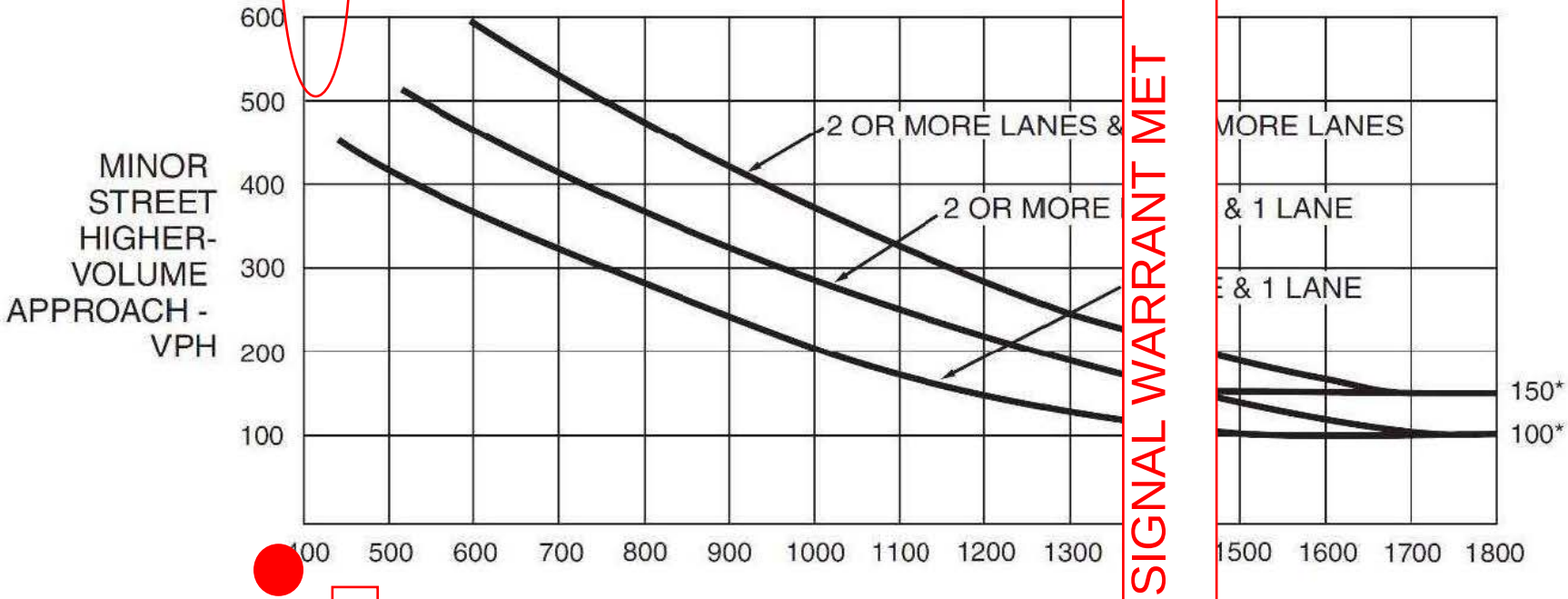
Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

3 - Collier/Nichols - Existing + Project PM Peak Hou

SIGNAL WARRANT MET

Figure 4C-3. Warrant 3, Peak Hou



773, 329

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

10 - Gunnerson/Riverside - Existing + Project PM Peak

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies a lower threshold volume for a minor-street approach with o e.

1 - I-15 NB Ramps/Nichols Rd - Existing + Ambient + Project

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho

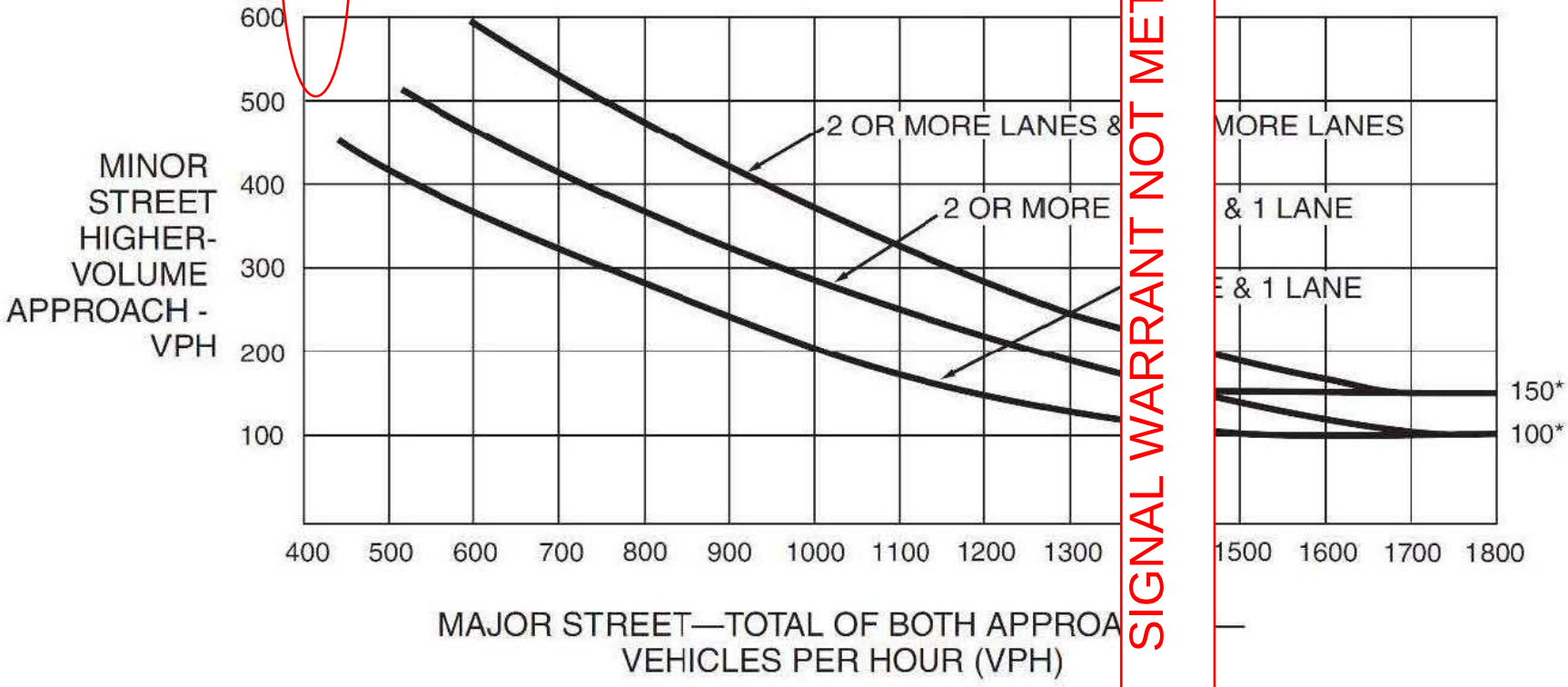
*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

10 - Gunnerson/Riverside - Existing + Ambient + Project AM

1486, 62

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

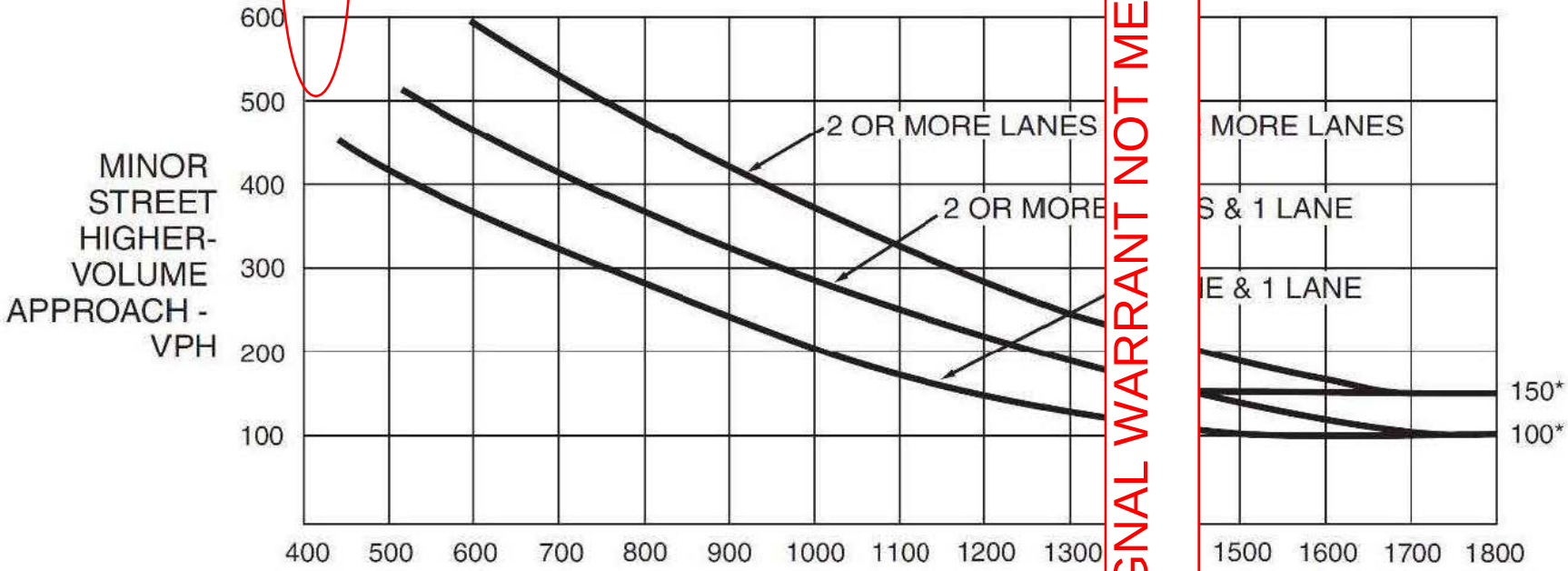


*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

1 - I-15 NB Ramps/Nichols Rd - Existing + Ambient + Project

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho



*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

470, 323

3 - Collier/Nichols - Existing + Ambient + Project PM Peak

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies ower threshold volume for a minor-street approach with e.

SIGNAL WARRANT MET

10 - Gunnerson/Riverside - Existing + Ambient + Project PM

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for r-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with e.

1 - I-15 NB Ramps/Nichols Rd - Ex + Ambient + Cumulative + Proje

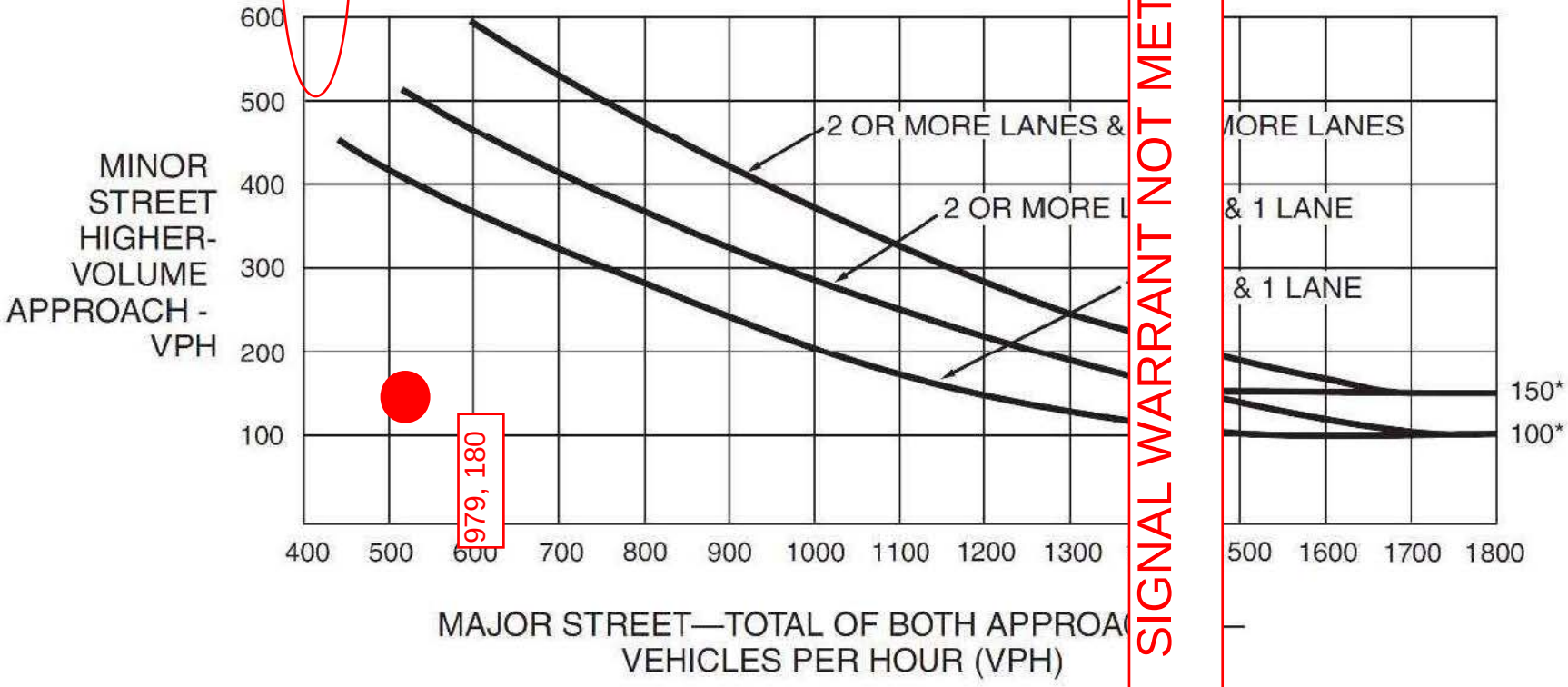
SIGNAL WARRANT MET

Figure 4C-3. Warrant 3, Peak Ho

*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

3 - Collier/Nichols - Ex + Ambient + Cumulative + Project AM

Figure 4C-3. Warrant 3, Peak Hou



*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

SIGNAL WARRANT NOT MET

10 - Gunnerson/Riverside - Ex + Ambient Cumulative + Project

SIGNAL WARRANT NOT MET

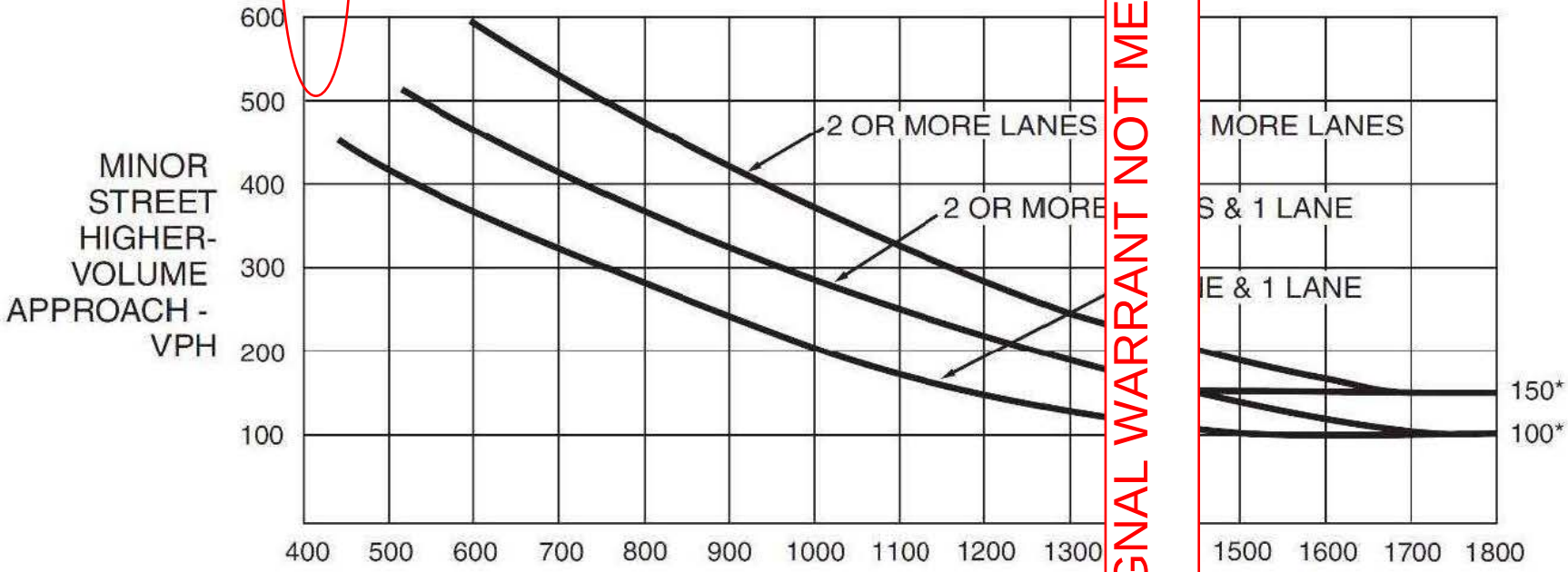
Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

1 - I-15 NB Ramps/Nichols Rd - Ex + Ambient + Cumulative + Proje

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Ho



534, 366

*Note: 150 vph applies as the lower threshold volume fo or-street approach with two or more lanes and 100 vph applies lower threshold volume for a minor-street approach with ne.

3 - Collier/Nichols - Ex + Ambient + Cumulative + Project PM

SIGNAL WARRANT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

10 - Gunnerson/Riverside - Ex + Ambient Cumulative + Project

SIGNAL WARRANT NOT MET

Figure 4C-3. Warrant 3, Peak Hou

*Note: 150 vph applies as the lower threshold volume for -street approach with two or more lanes and 100 vph applies a ower threshold volume for a minor-street approach with o .

Appendix L

Service Planning Letter #3069-0

Elsinore Valley Municipal Water District

Service Planning Letter # 3069-0

March 23, 2018

P.O. Box 3000 ~ 31315 Chaney St ~ Lake Elsinore, CA 92530
Phone: (951) 674-3146 ~ Fax: (951) 641-7554

Description:	Commercial Travel Center (WO# 17-007)	**Zoning:**	Commercial
Address:	0 Riverside Drive	**# of Lots:**	2
City:	Lake Elsinore **State:** CA **Zip:** 92530	**Acreage:**	+-2.39
APN:	378-007-	**Tract Map:**	
Phone:	(714) 695-9300	**Pressure Zone:**	1434
Email:	jkaraki@westernsec.com		

Kassab Travel Center
4887 E. La Palma Avenue, Suite 707
Anaheim, CA 92807
Attn: Joseph Karaki

Will Serve Fees Paid: $340.00
Paid Date: 03/22/2018
Check / Receipt #: 402791

DEVELOPER
Kassab Travel Center
4887 E. La Palma Avenue, Suite 707
Anaheim, CA 92807
Attn: Joseph Karaki

ENGINEERING
Western States Engineering, Inc.
4887 E. La Palma Avenue, Suite 707
Anaheim, CA 92807
Attn: Joseph Karaki

Elsinore Valley Municipal Water District ("EVMWD") has determined that water is available to serve the above referenced project based on the information provided. Sewer will require a line extension on Collier Ave. This determination of water & sewer availability shall remain valid for two years from the date of this letter. If the construction of the project has not commenced within this two year time frame, EVMWD will be under no further obligation to serve the project unless the developer receives an updated letter from EVMWD reconfirming water and sewer availability. EVMWD reserves the right to re-evaluate, revise, and update the Service Planning Letter at any time. EVMWD considers the conditions to have expired, automatically, two years from the date of issuance of the Letter, (Section 3903. C EVMWD Administrative Code).

EVMWD will provide such potable water at such pressure as may be available from time to time as a result of its normal operations. Installation of facilities through developer funding shall be made in accordance with the current EVMWD Standards and Administration Code. In order for us to provide adequate water for domestic use as well as fire service protection, it may be necessary for the developer to fund the cost of special facilities, such as, but not limited to booster pumps, in addition to the cost of mainlines and services. EVMWD will provide more specific information regarding special facilities and fees after submittal of your improvement plans, fire department requirements, and engineering fees for this project.

An estimate of fees will be quoted during the plan check process. Once plans have been accepted by the District and mylars have been submitted a formal invoice of fees will be prepared.

For all Commercial Development, please contact Keith Martinez at (951) 674-3146, extension 8326 regarding District requirements, Industrial Waste application, fees and inspection.

This letter shall at all times be subject to such changes or modifications by EVMWD.
If you have any questions regarding the above, please contact me at (951) 674-3146 Ext. 8427

Authorized by: Christina Bachinski **Date:** 3/23/18

Elsinore Valley Municipal Water District

RECEIVED
MAR 22 2018
EVMWD
ENGINEERING DEPARTMENT
BY: HG

COMMERCIAL/INDUSTRIAL
ELSINORE VALLEY MUNICIPAL WATER DISTRICT
WILL SERVE & CONNECTION FEE APPLICATION

GENERAL INFORMATION

Date of Application: Mar 22, 2018

Agency Requesting Letter: PLANNING DEPT./BUILDING & SAFETY

Preferred Delivery Method of Completed Will Serve (Check One):
- ☐ Pickup at District Offices
- ☑ Email to (Circle one): Owner/Developer Representative
- ☐ Mail to (Circle one): Owner/Developer Representative

CONTACT INFORMATION

Owner/Developer

Contact Name: RON KASSAB/JOSEPH KARAKI

Business Name: KASSAB TRAVEL CENTER

Mailing Address: C/O 4887 E. LA PALMA AVE., SUITE 707 City: ANAHEIM State: CA Zip: 92807

Email: jkaraki@westernsec.com Telephone: (714) 695-9300 Ext. 100

Representative for Owner/Developer (or) Engineering Firm, if applicable

Contact Name: JOSEPH KARAKI

Business Name: WESTERN STATES ENGINEERING INC. Business Type: DESIGN & BUILD

Mailing Address: 4887 E. LA PALMA AVE., SUITE 707 City: ANAHEIM State: CA Zip: 92807

Email: jkaraki@westernsec.com;rayojeda@westernsec.com Telephone: (714) 695-9300 Ext. 100

PROJECT INFORMATION

Property Address: 29301 RIVERSIDE DRIVE City: LAKE ELSINORE State: CA Zip: 92530

Assessor's Parcel Number(s): 378-030-07 & 378-030-09

Total Acres: +- 2.39 ACRES

Nearest Cross Streets: COLLIER AVE.

Type of Construction: ☑ New Construction** ☐ Tenant Improvement ☐ New Tenant ☐ Change in Ownership

Will Serve Request for: ☑ Water & Sewer ☐ Water Only ☐ Sewer Only ☑ Irrigation Meters

** FOR NEW COMMERCIAL/INDUSTRIAL BUILDINGS:

- ☑ Attach a Site Map (8.5" x 11") identifying building/suite numbers, associated square footage(s), and intended uses (i.e. office, warehouse, retail, restaurant, etc.).
- ☐ Provide Engineer's domestic & irrigation water demand calculations.

Elsinore Valley Municipal Water District

SERVICES REQUESTED

	SEWER	WATER		
Building/Suite #	**No. of Units**	**Meter Type** Domestic / Irrigation	**Meter Size** ¾" 1" 1-½" 2" 3" 4"	**Backflow Required?** Yes / No / Not applicable
BUILDING "A"	2	Domestic and Irrigation	2	Yes NOT SURE YET
Building "B"	1	Domestic	2	Yes
Canopy 1	N/A	N/A	N/A	N/A
canopy 2	N/A	N/A	N/A	N/A

If you require more information please contact Engineering at (951) 674-3146 Ext. 8427

ENGINEERING FEES (*EVMWD Administrative Code, Section 2600*)

SERVICE AVAILABILITY LETTERS

Tract & Commercial Development $340.00

INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED.

FOR EVMWD USE ONLY

Fees Due: _____ Reviewed by: _____

Reimbursements: ☐ Yes ☐ No Reimbursement #(s) _____

Date Payment Received: _____ Receipt No.: _____ CK: _____

Date Received by Engineering: _____ Division: _____

Will Serve #: _____ WO#: _____ ☐GIS ☐Log ☐CIPAce

Previous Account#: _____ Meter Size: _____ Pressure Zone: _____

Mail application form with appropriate fee to: EVMWD, P.O. Box 3000, Lake Elsinore, CA 92531-3000.

For questions, please contact Engineering at (951) 674-3146 Ext. 8427 or email Development@evmwd.net.

Please allow up to 10 working days for processing once the completed application has been accepted by the District.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # BUILDING "A" **Square Footage** +- 8,360 S.F.

OPERATION(S) (*Check all that apply.*)

- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☐ Restaurant, # Fixtures_____
- ☑ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☐ Service Station
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet
- ☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

Building "A" is a proposed convenience store that caters for both transients and the neigborhood.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # Building "B" (QSR with drive thru window) **Square Footage** 2,543 S.F.

OPERATION(S) (*Check all that apply.*)

- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☑ Restaurant, # Fixtures 10
- ☐ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☐ Service Station
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet
- ☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

Building "B" is a Quick Service Restaurant (QSR) with a drive through pick-up window.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # Canopy 1 **Square Footage** 4,392 S.F.

OPERATION(S) (*Check all that apply.*)

- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms_____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☐ Restaurant, # Fixtures_____
- ☐ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☑ Service Station
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet

☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

Elsinore Valley Municipal Water District

PROJECT INFORMATION (*continued*)

Duplicate this page for each building/suite.

Building/Suite # Canopy 2 **Square Footage** 1,700 S.F.

OPERATION(S) (*Check all that apply.*)

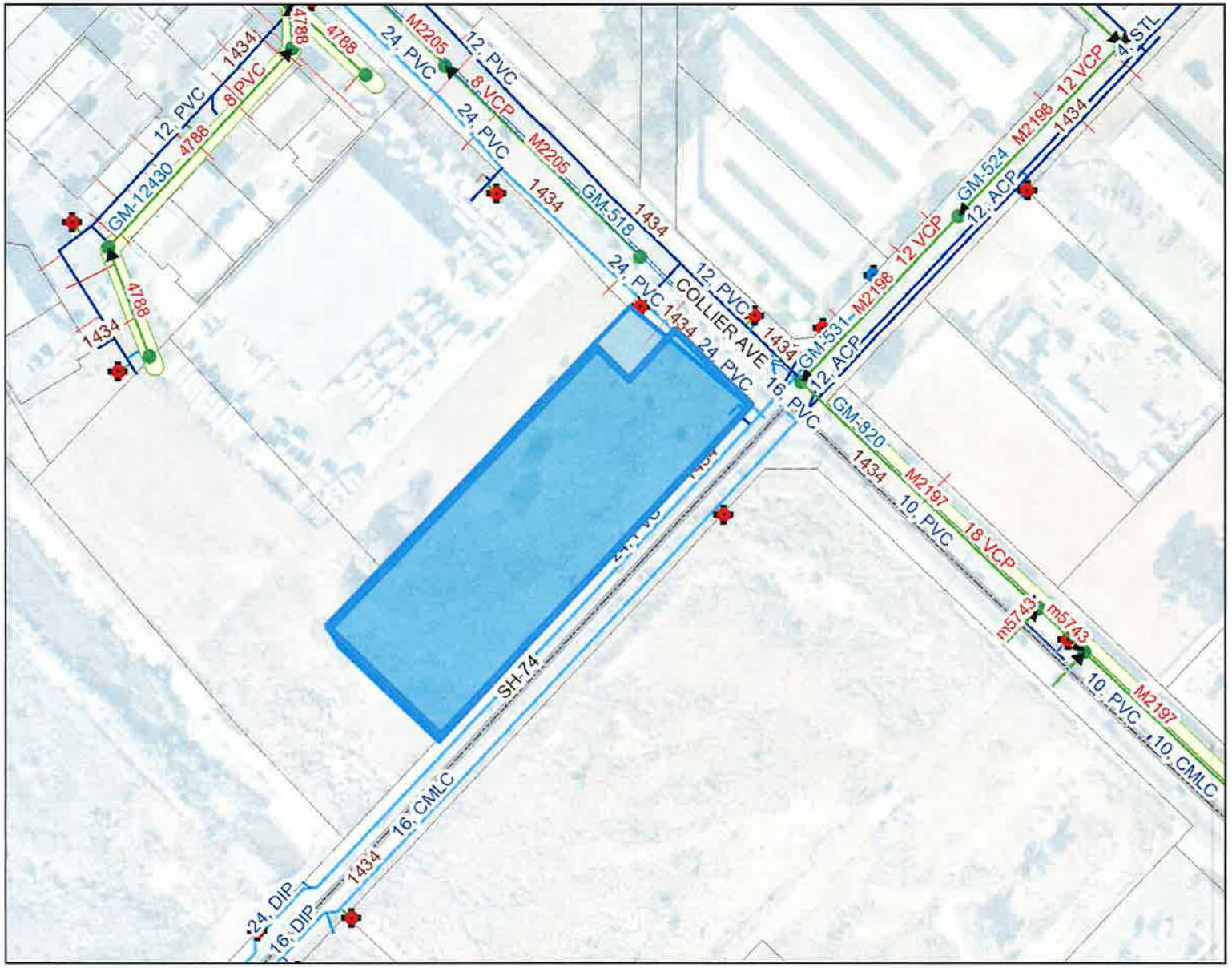
- ☐ Animal Kennel
- ☐ Auditorium/Amusement
- ☐ Auto Detail/Wash, Type_____
- ☐ Auto Sales/Repair
- ☐ Auto Service/Repair
- ☐ Bar, # Seats_____
- ☐ Beauty/Barber Shop, # Seats_____
- ☐ Bowling/Skating
- ☐ Campsite (Developed) # Sites_____
- ☐ Car Wash-Tunnel Type
- ☐ Car Wash-Wand Type
- ☐ Church
- ☐ Club
- ☐ Dentist Office
- ☐ Doctor Office
- ☐ Drive-In Theater
- ☐ Dry Cleaning
  - ☐ Office Only, # Employees_____
  - ☐ Plant, # Employees_____
- ☐ Dry Manufacturing
- ☐ Financial Institutions
- ☐ Golf Course/Camp/Park
- ☐ Health Spa
- ☐ Hospital
  - ☐ With Showers, # Rooms_____
  - ☐ Without Showers, # Rooms____
- ☐ Hotel/Motel/Rooming House, # Rooms _____
- ☐ Indoor Theater
- ☐ Laundromat, # Machines _____
- ☐ Lumber Yard
- ☐ Mobile Home Park, # Spaces _____
- ☐ Mortuary/Cemetery
- ☐ Night Club
- ☐ Nurseries/Greeneries
- ☐ Nursing Home, # Beds _____
- ☐ Office Building
- ☐ Open Storage
- ☐ Pre-School, # Students _____
- ☐ Professional Building
- ☐ Restaurant, # Fixtures_____
- ☐ Retail Sales/Store/Unknown
- ☐ RV Camp With Sewer Hookups, # Sites_____
- ☐ School
  - ☐ With Cafeteria and Showers, # Students_____
  - ☐ Cafeteria without Showers, # Students_____
  - ☐ No Cafeteria, No Showers, # Students_____
- ☐ Service Shop
- ☑ Service Station (GAS/FUELLING)
- ☐ Shopping Center
- ☐ Special Events Center, # Attendance _____
- ☐ Supermarket
- ☐ Veterinarian
- ☐ Warehousing
- ☐ Wholesale Outlet
- ☐ Other_____

Provide a detailed description of the type of manufacturing, business processes, production, or service activities proposed for this site. This information will be used to determine whether the proposed project will require pre-treatment of wastewater. If the project requires a Pre-Treatment Program, you will be required to contact Industrial Waste at (951) 674-3146 Ext. 8326, before a Will Serve will be issued.

CANOPY 2 is a Gas Fuelling Station for RV.

378-030-007 & 378-030-009

Elsinore Valley Municipal Water District



Legend

- EVMWD Boundary
- Highways
- Street Centerlines
- Parcels
- Waterbodies
- Force Main
- Gravity Mains
- Label Gravity Mains
- Label Gravity Mains Diameter
- Label Gravity Mains ID
- Manhole
- Service Laterals
- Sewer Easements
- Fire Hydrants
  - Fire Hydrant
  - Wharfhead
- Label Pressure Main
- Label Pressure Zone
- Pressure Main
  - Distribution Main
  - Transmission Main
  - Air Release
  - Blowoff
  - Hydrant Lateral
  - Unknown
  - Sampling Point
- Pump Station

1: 1,968

328.0 0 163.98 328.0 Feet

Data Sources: EVMWD, County of Riverside

This application has been provided to give a visual display of District facilities and related geographic information. To be sure of complete accuracy, please check with Engineering staff for the most up to date information.

3/23/2018 10:34:36 AM

Notes

Elsinore Valley Municipal Water District

31315 Chaney St
PO Box 3000
Lake Elsinore, CA 92531
Office: (951) 674-3146
Fax: (951) 346-3352

March 22, 2018 10:41

Staff ID:	SMUN
Receipt No.	402791
Account:	
Customer:	
Service:	

Tender Methods

Visa	($340.00)
Total	($340.00)
Change	$0.00

Beginning Balance	$340.00
Payments applied	($340.00)

THANK YOU FOR YOUR PAYMENT !

Did you know you can make payments 24/7 using your credit/debit card by calling our main number or accessing your account at www.evmwd.com?

Visit our website at www.evmwd.com to access your account and make payments 24/7 or get valuable conservation information.

USE WATER WISELY!