APPENDIX G/INITIAL STUDY FOR A MITIGATED NEGATIVE DECLARATION

Environmental Checklist Form for:
T-6294/P25-03555

1.	**Project title:** Vesting Tentative Tract Map No. 6294 Planned Development Application No. P25-03555
2.	**Lead agency name and address:** City of Fresno Planning and Development Department 2600 Fresno Street, 3rd Floor, Room 3043 Fresno, CA 93721
3.	**Contact person and phone number:** Chris Lang, Supervising Planner City of Fresno Planning and Development Department (559) 621-8023
4.	**Project location:** The Project site is located at 5326 North Grantland Avenue, at the southeast corner of North Grantland and West Barstow Avenues in the City of Fresno (APN: 505-060-07, approximately 30-acres). The site is bounded by Herndon Canal and West Barstow Avenue (north) and North Grantland Avenue (west), with West Shaw Avenue, and North Veterans Boulevard located further south and east of the project site, respectively. The property is also situated approximately 0.65 miles southwest of State Route (SR) 99.
5.	**Project sponsor's name and address:** Walter Diamond, Director of Entitlements Lennar Homes of California 5 River Park Place East, Suite 210 Fresno, CA 93720
6.	**General & Community plan land use designation:** Medium Density Residential (5.0-12 D.U./acre) within the Fresno General Plan and West Area Neighborhoods Specific Plan (WANSP or Specific Plan)
7.	**Zoning:** RS-5 (Residential Single-Unit, Medium Density)

8.	**Description of Project:** The Project pertains to approximately 30 acres located at the southeast corner of North Grantland Avenue and West Barstow Avenue in the City of Fresno (APN 505-060-07). Vesting Tentative Tract Map No. 6294 (T-6294) will subdivide the subject property into a 187-lot single-unit residential subdivision with five (5) outlots. • Outlot A will be dedicated for open space and recreation in the center of the residential subdivision. • Outlot B through Outlot D will be dedicated for landscaping, irrigation and pedestrian purposes, located along the North Grantland Avenue frontage. • Outlot E is located near the southeastern corner boundary and will be dedicated to a pedestrian trail. A Planned Development Permit is also requested to allow for modification of the RS-5 property development standards (Chapter 15, Article 59 of Fresno Municipal Code). The Project also includes on- and off-site improvements including external city circulation roads, interior local streets, curbs, gutters, storm drains, sidewalks, pedestrian trail, open space, landscaping, lighting and retaining walls, all of which will be developed to City standards by the Project developer. The Project will connect to existing City of Fresno water, sewer and storm drainage service systems. All residential units will be equipped with 410-watt solar panels, utilize all electric appliances and will be EV (electric vehicle)-ready (pre-wired during construction to allow for installation of EV residential charger in the future). The subject property has a land use designation of Residential Medium Density (5.0-12 D.U./acre) within the West Area Neighborhoods Specific Plan (WANSP) and is zoned RS-5 (Residential Single-Unit, Medium Density) and historically has been cultivated as a commercial orchard. The applicant is requesting the approval of the following entitlements: • Vesting Tentative Tract Map No. 6294 proposes to subdivide the subject property into a 187-lot single-unit residential subdivision with five (5) outlots. • Planned Development Permit Application No. P25-03555 requests to reduce the minimum 10’ rear yard setback to 5’, the minimum front yard setback from 13 feet to 9 feet, a decrease in minimum lot size from 4,000 square feet to approximately 3,700 square feet, and the increase in maximum lot coverage from 60 percent to 65 percent. For purposes of analysis in this document, unless otherwise stated, the term Project includes all components proposed in this Project Description.

Construction of the residential development would start Q3 2026 and full buildout will be completed February 2029. It is anticipated that the following equipment would be used during construction activities:

- Roller
- Loaded trucks
- Excavator
- Generator
- Service truck
- Air compressor

9. **Surrounding land uses and setting:**

	Planned Land Use	Existing Zoning	Existing Land Use
North	Open Space, Residential-Medium Density, Residential-Medium High Density, Residential - Medium Low Density, Commercial-Community	OS *(Open Space)*, RS-5 *(Single-Unit Residential-Medium Density)*, RM-1 *(Multi-Unit Residential-Medium High Density)*, RS-4 *(Single-Unit Residential, Medium Low Density),* CC *(Commercial-Community)*	Undeveloped, Canal, Residential, Commercial
East	Open Space, Residential-Medium High Density, Mixed Use-Regional	OS (*Open Space)*, RM-1 *(Multi-unit Residential, Medium High)*, RMX *(Regional Mixed Use), CMX (Corridor/Center Mixed Use), NMX (Neighborhood Mixed Use)*	Undeveloped, Canal
South	Neighborhood Mixed Use	NMX *(Neighborhood Mixed Use)*	Rural Residential and Undeveloped
West	Open Space, Residential-Medium Density, Residential- Medium Low Density	OS (Open Space) RS-5 *(Single-Unit Residential, Medium Density)*, RS-4 *(Single-Unit Residential, Medium Low)*	Medium Density Residential

10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):**

- City of Fresno Planning and Development Department;
- City of Fresno Department of Public Works;
- City of Fresno Department of Public Utilities;

	• City of Fresno Fire Department; • City of Fresno Police Department; • Fresno Irrigation District • Fresno Metropolitan Flood Control District; and • San Joaquin Valley Air Pollution Control District.
11.	**Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code (PRC) Section 21080.3.1? If so, has consultation begun?** The State requires lead agencies to consider the potential effects of proposed Projects and consult with California Native American tribes during the local planning process for the purpose of protecting Traditional Tribal Cultural Resources through the California Environmental Quality Act (CEQA) Guidelines. Pursuant to PRC Section 21080.3.1, before public distribution of the document, the lead agency shall begin consultation with the California Native American tribe that is traditionally and culturally affiliated with the geographical area of the proposed Project. Such significant cultural resources are either sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe which is either on or eligible for inclusion in the California Historic Register or local historic register, or, the lead agency, at its discretion, and support by substantial evidence, choose to treat the resources as a Tribal Cultural Resources (PRC Section 21074(a)(1-2)). According to the most recent census data, California is home to 109 currently recognized Indian tribes. Tribes in California currently have nearly 100 separate reservations or Rancherias. Fresno County has a number of Rancherias such as Table Mountain Rancheria, Millerton Rancheria, Big Sandy Rancheria, Cold Springs Rancheria, and Squaw Valley Rancheria. These Rancherias are not located within the city limits. Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and Project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See PRC Section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per PRC Section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that PRC Section 21082.3(c) contains provisions specific to confidentiality. Currently, the Table Mountain Rancheria Tribe and the Dumna Wo Wah Tribe have requested to be notified pursuant to Assembly Bill 52 (AB 52). A certified letter was mailed to the above mentioned tribes on February 12, 2026. The 30-day comment period ended on March 16, 2026. To date, no responses have been sent to the City. Should the City receive communication with a tribal group, they will work in good faith to address any potential cultural resources concerns. .

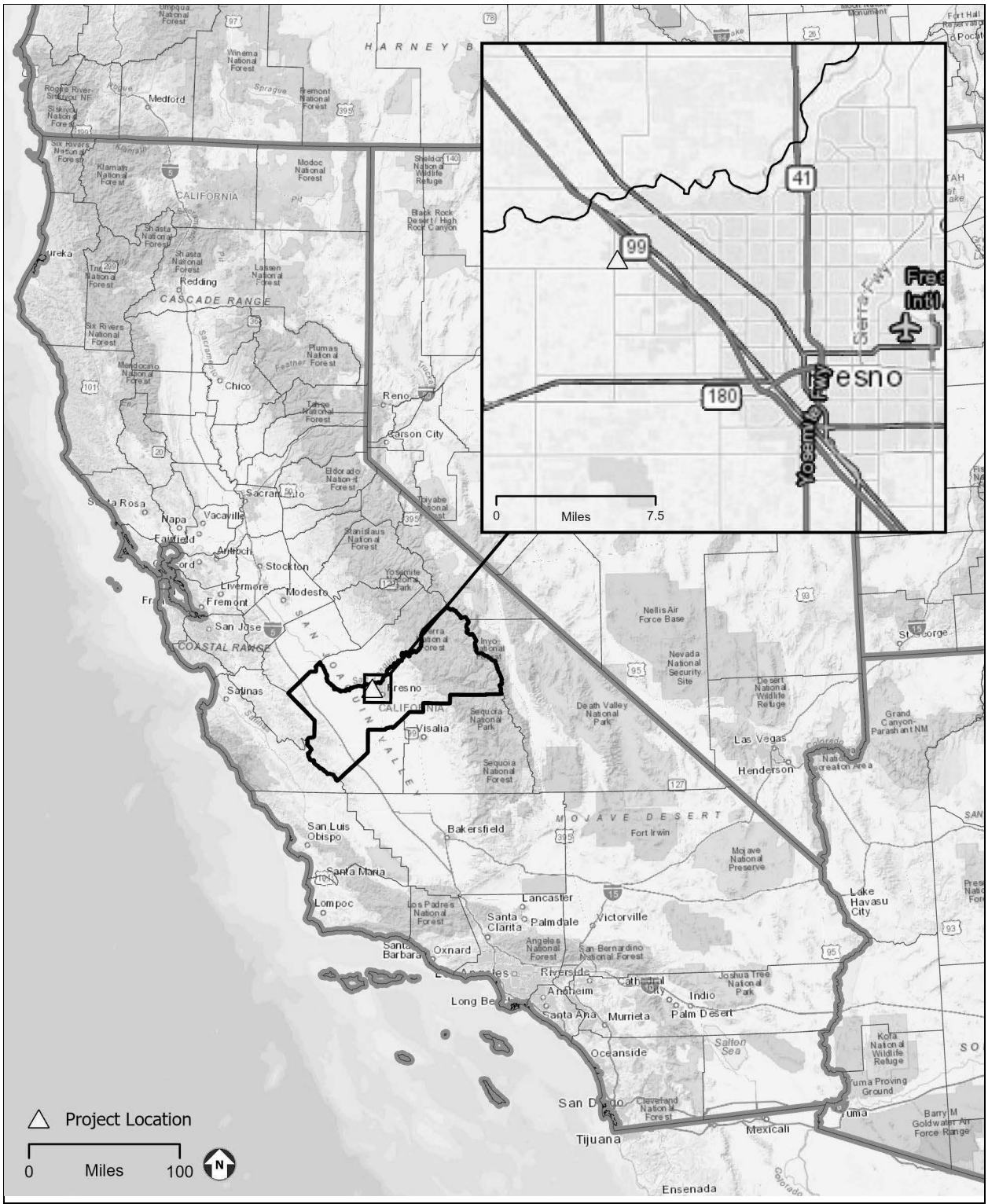


Figure 1
Regional Location



Figure 2
Project Area

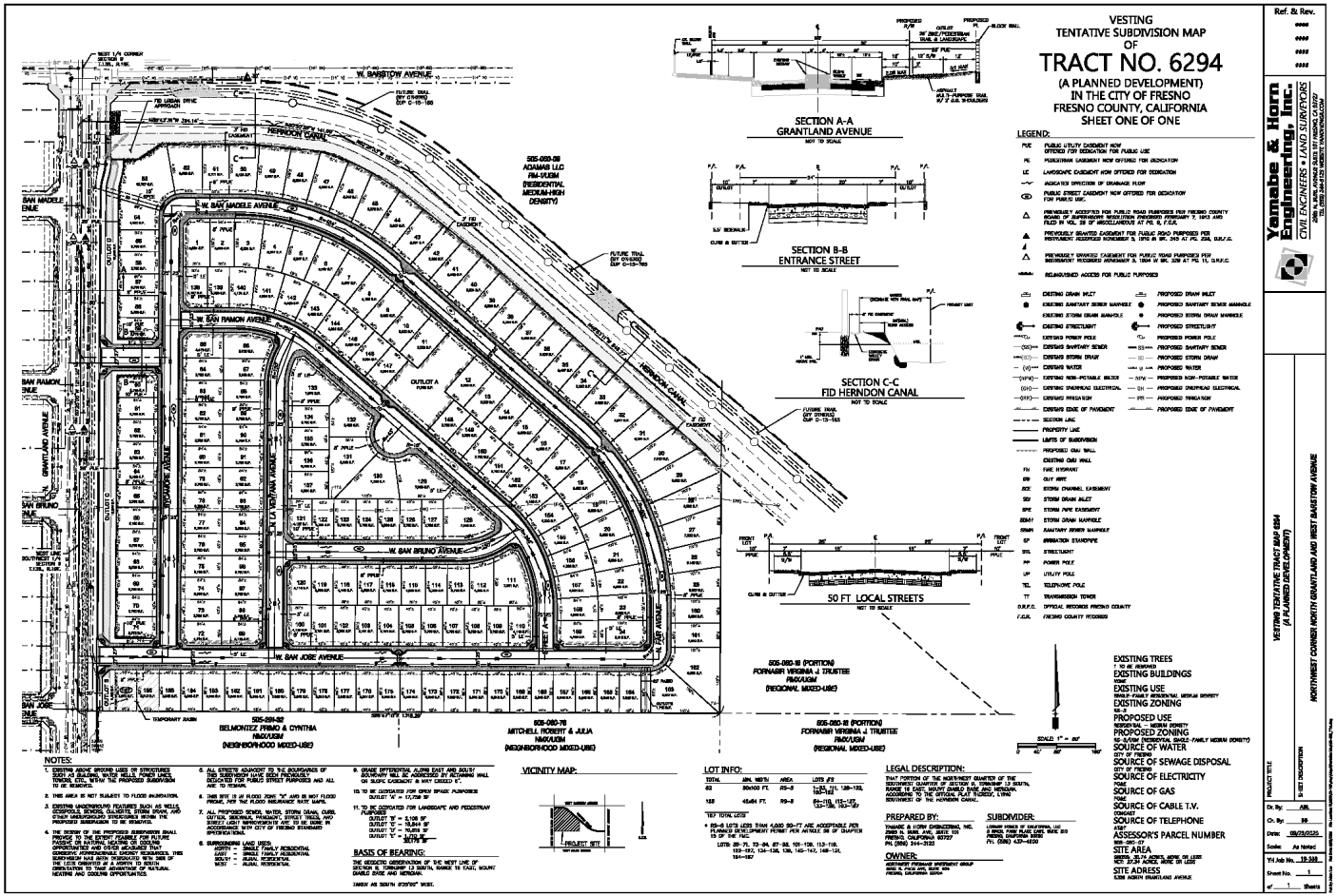


Figure 3
Vesting Tentative Subdivision Map No. 6294

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ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources
☐	Air Quality	☐	Biological Resources
☐	Cultural Resources	☐	Energy
☐	Geology/Soils	☐	Greenhouse Gas Emissions
☐	Hazards and Hazardous Materials	☐	Hydrology/Water Quality
☐	Land Use/Planning	☐	Mineral Resources
☐	Noise	☐	Population/Housing
☐	Public Services	☐	Recreation
☐	Transportation	☐	Tribal Cultural Resources
☐	Utilities/Service Systems	☐	Wildfire
☐	Mandatory Findings of Significance		

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

___	I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
_X_	I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
___	I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.
___	I find that the proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An EIR is required, but it must analyze only the effects that remain to be addressed.
___	I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed

	adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Chris Lang 8/12/2026

Chris Lang, Supervising Planner Date

1. For purposes of this Initial Study, the following answers have the corresponding meanings:

   a. “No Impact” means the specific impact category does not apply to the project, or that the record sufficiently demonstrates that project specific factors or general standards applicable to the project would result in no impact for the threshold under consideration.

   b. “Less Than Significant Impact” means there is an impact related to the threshold under consideration, but that the potential impact would be less than significant.

   c. “Less Than Significant with Mitigation Incorporation” means there is a potentially significant impact related to the threshold under consideration, however, with the mitigation incorporated into the project, the impact would be less than significant.

   d. “Potentially Significant Impact” means there is substantial evidence that an effect resulting from the proposed project may be significant related to the threshold under consideration.

2. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

3. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

4. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant.

If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

5. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from, "Earlier Analyses," as described in (6) below, may be cross-referenced).

6. Earlier analyses may be used where, pursuant to the tiering, Program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a. Earlier Analysis Used. Identify and state where they are available for review.

    b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

    c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

7. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

8. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

9. The explanation of each issue should identify:

    a. The significance criteria or threshold, if any, used to evaluate each question; and

    b. The mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS – Except as provided in PRC Section 21099, would the Project:				
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock out-croppings, and historic buildings within a state scenic highway?			X	
c) In non-urbanized areas, substantially degrade the existing visual character or quality public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

DISCUSSION

a) Have a substantial adverse effect on a scenic vista?

Visual resources are generally classified into two categories: scenic views and scenic resources. Scenic views are elements of the broader viewshed such as mountain ranges, valleys, and ridgelines (City of Fresno Planning and Development Department, 2025a). They are usually mid-ground or background elements of a viewshed that can be seen from a range of viewpoints, often along a roadway or other corridor. Scenic resources are specific features of a viewing area (or viewshed) such as trees, rock outcroppings, and historic buildings. They are specific features that act as the focal point of a viewshed and are usually foreground elements.

The Project is located within the Plan Area of the West Area Neighborhood Specific

Plan (WANSP) and no part of the Plan Area is designated as a scenic vista by the City of Fresno General Plan, nor does the Plan Area contain any unique or distinguishing features that would qualify it for designation as a scenic vista. Furthermore, the construction of the proposed Project would not significantly affect or block a potentially scenic vista in the City. Therefore, the proposed Project would have a **less than significant impact** on scenic vistas.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

There are no designated State Scenic Highways within or in the vicinity of the Plan Area (City of Fresno Planning and Development Department, 2025a); therefore, the Project is not within or near a State Scenic Highway. There are no highways in Fresno County listed as a Designated Scenic Highway by the Caltrans Scenic Highway Mapping System. Fresno County has three eligible State Scenic Highways; the nearest eligible highways are located east of the Planning Area along State Route 180 (approximately 7 miles east of the Planning Area) and along State Route 168 east of the City of Clovis (approximately 5 miles east of the Planning Area). The nearest designated State Scenic Highway is located within the County of Madera, more than 30 miles northeast of the Planning Area.

As noted in Impact I (a) above, the Specific Plan stated that no scenic vistas were present within the planning area.

Furthermore, the Project site was historically cultivated as a commercial orchard, but the trees were no longer productive and were removed by the property owner; the Project site is now an open field. The Project site is relatively flat and does not contain any rock outcroppings.

Since there are no historical buildings, trees of importance, rock outcroppings or eligible or officially designated State Scenic Highways within or in close proximity to the Project site, implementation of the proposed Project would not damage scenic resources within these designations. Therefore, there would be a **less than significant impact.**

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?

Although the proposed Project would change the visual characteristics of the Project site by constructing a residential subdivision on an undeveloped agricultural parcel, the design of the homes would be consistent and compatible with the visual character of the Project vicinity. Construction activities associated with the Project would create temporary changes in views of the Project site. The proposed residential subdivision

would be consistent with the visual character of the existing residential subdivision located directly west of the Project site.

The subject property has a land use designation of Residential Medium Density (5.0-12 D.U./acre) and is zoned RS-5 (Residential Single-Unit, Medium Density). According to Fresno Municipal Code Chapter 15, Part II, Article 9, detached single-unit dwellings are a permitted use within the RS-5 zoning district. The proposed Project will comply with all zoning and development requirements, including requirements related to visual qualities such as landscaping and façade design.

Although the characteristics of the Project site would change, the Project would not substantially degrade the visual character or quality of the site and its surroundings, as the area is currently developed with similar residential uses. A landscape plan approved by the City's Public Works Department is required prior to recordation of the Final Map. The Project itself will not degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality. Therefore, the Project would appear to be similar to nearby properties and have a **less than significant impact.**

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The Project site is located in an area that has mixed urban and rural uses, which would contain preexisting exterior lighting from surrounding developments and existing street lighting. The proposed Project would introduce new sources of light and glare to the area in the form of street lighting, windows, and porch lights.

Projects are required to submit plans that demonstrate that all materials which may have potential to be reflective and produce glare would be made of non-reflective materials and not cause glare. The Planning and Development Department will ensure that the approved project uses appropriate building materials with low reflectivity to minimize potential glare nuisance to off-site receptors.

The Project will construct an underground street lighting system to *Public Works S*tandard E-1 and E-7A, E-7B within the limits of this subdivision. Streetlights installed on major streets shall be fed from a service pedestal with a master photo control as detailed in Section 3-3.17 of the City Specifications and Standard Drawings E-15, E-17 and/or E-18 or as approved by the City Engineer. New light sources are also required to submit a lighting plan subject to Section 15-2508 and Section 15-2015 of the City of Fresno Municipal Code prior to the approval of the entitlement application.

During construction, dusk-to-dawn security lighting would be utilized for the temporary construction staging area, parking area, construction office trailer entries, and site access points, but it is not anticipated that lighting will be required for construction during nighttime hours. If nighttime lighting is required during construction, lights will be directed down and shielded to prevent light pollution on adjacent properties and be temporary in nature given that lighting activities from construction would cease when

construction is complete.

In addition, compliance with the California Building Code (CBC, Title 24, California Code of Regulations) would also reduce glare and lighting impacts. For example, California Green Building Standards has numerous requirements that may be applicable to the Project, such as A5.203.1.1.1, which requires that all newly installed outdoor lighting power shall be no greater than 90 percent of the allowed outdoor lighting power, and general hardscape lighting within scope of Title 24, Part 6, Section 140.7(b)1 shall have a color temperature no higher than 3000 Kilowatts. Furthermore, Section 5.106.8 regulates light pollution reduction to reduce Backlight, Uplight and Glare (BUG) in compliance with BUG ratings standards.

Pursuant to Fresno Municipal Code, Chapter 15, Part 4, Article 41, Section 15-4108(O), T-6294 would need to comply with all street lighting criteria and reviewed by the Public Works Director. Subsequently, building plans that include lighting specifications would be submitted for review and approval prior to building permit issuance with the City of Fresno to ensure compliance with all City standards related to lighting, such as Fresno Municipal Code, Chapter 15, Part 3, Article 25, Section 15-2508, which regulates lighting and glare. Therefore, there would be a **less than significant impact.**

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FORESTRY RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			X	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?			X	

DISCUSSION

The analysis in this section is substantiated by an Agricultural Land Evaluation and Site Assessment (LESA) and Agricultural Conversion Study (QK, 2025a), prepared for the Project and attached as Appendix A.

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The California Department of Conservation (DOC) established the Farmland Mapping and Monitoring Program (FMMP) in 1982. The FMMP is a non-regulatory program and provides a consistent and impartial analysis of agricultural land use and land use changes throughout California. The FMMP produces maps and statistical data used to analyze the impacts on California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status.

CEQA uses the California DOC FMMP categories of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland to define agricultural land for the purposes of assessing environmental impacts (PRC Section 21060.1(a)). The DOC has classified the Project site as Farmland of Local Importance under the FMMP (QK, 2025a). According to the DOC, the Project parcel is not subject to a Williamson Act land use contract.

The implementation of the proposed Project would convert 30 acres of Farmland of Local Importance to a non-agricultural use. However, this classification is not covered under CEQA. Although the Project site is designated as Farmland of Local Importance, a LESA was prepared for this Project in order to assess the significance of the project-specific impacts to agricultural resources.

California Agricultural Land Evaluation and Site Assessment Model (LESA)

The California Department of Conservation developed to provide lead agencies with

a methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process (Public Resources Code Section 21095). The LESA is composed of six different factors, which are divided into two sets: Land Evaluation (LE) and Site Assessment (SA) factors. Two LE factors (Land Capability Classification Rating and Storie Index Rating) are based upon measures of soil resources quality and intended to measure the inherent, soil-based qualities of land as they relate to agricultural suitability. Four SA factors (Project Size Rating, Water Resource Availability Rating, Surrounding Agricultural Lands Rating, and Surrounding Protected Resource Lands Rating) are intended to measure social, economic, and geographic attributes that also contribute to the overall value of agricultural land. The two sets of factors are evenly weighted, meaning the two LE factors and four SA factors are of equal importance; however, for a given project, each of these six factors is separately rated in a 100-point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. This final project score becomes the basis for making a determination of the potential impact's level of significance for the project, based upon a range of established scoring thresholds.

Land Evaluation Factors

The Land Capability Classification Rating (LCC) indicates the suitability of soils for most kinds of crops. Groupings are made according to the limitations of the soils when used to grow crops and the risk of damage to soils when used in agriculture. Soils are rated from Class I to Class VIII, with soils having the fewest limitations receiving the highest rating (Class I). Specific subclasses are also utilized to further characterize soils. The LESA Model LCC score utilizes a specified method based on the proportion of the site within that classification. The percentage of the site within each LCC classification is multiplied by the corresponding score designation and then added together to give an overall score of the Project. The LCC score of each soil type is shown in Table 1. The LCC score for the Project site is shown in Table 2.

Table 1
Land Capability Classifications

Classification Symbol	Rating
I	100
IIe	90
IIs, w	80
IIIe	70
IIIs, w	60
IVe	50
IVs, w	40
V	30
VI	20

VII	10
VIII	0

Source: Appendix A

The Storie Index Rating

The Storie Index Rating provides a numeric rating (based upon a zero to 100 scale) of the relative degree of suitability or value of a given soil for intensive agriculture. The Rating is based upon soil characteristics only. Four factors that represent the inherent characteristics and qualities of the soil are considered in the Storie Index rating: profile characteristics, texture of the surface layer, slope, and other factors such as drainage or salinity. In some situations, only the United States Department of Agriculture's LCC information may be available. In those cases, the Storie Index ratings can be calculated from information contained in soil surveys by qualified soil scientists; however, if limitation of time and/or resources restrict the derivation of the Storie Index Rating for a given project, it may be possible to adapt the Land Evaluation by relying solely upon the LCC Rating (QK, 2025a).

Based on the weighted percentage of the total Project acreage, the comprehensive LCC Rating score is 40.0. Table 2 shows the proportional breakdown and comprehensive score of the Project site as it relates to the overall Storie Index Rating. Based on the weighted percentage of the total Project acreage, the comprehensive Storie Index Rating score is 24.0.

Table 2
Project Site – LLC Rating and
Storie Index Rating Proportional Scores

Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
ScA	30.3	100%	IVs	40	40	24	24
Total Acres	**30.3**	**1**		**LCC Total**	**40.0**	**Storie Total**	**24.0**

Site Assessment (SA) Factors

The four SA factors that are separately rated and included in the LESA are discussed below.

1) The Project Size Rating

The Project Size Rating is based upon identifying acreage figures for three separate groupings of soil classes within the project site, and then determining what grouping generates the highest Project Size Rating. The Project Size Rating relies upon acreage figures that were tabulated under the LCC Rating. As shown in Table 3, the

Project Size Rating is 0.

2) The Water Resources Availability Rating

The Water Resources Availability Rating is based upon identifying the various water sources that may supply a given property, and then determining whether different restrictions in supply are likely to take place in years that are characterized as being periods of drought and non-drought on a 100-point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. This final project score becomes the basis for making a determination of the potential impact's level of significance for the project, based upon a range of established scoring thresholds. As shown in Table 3, the Project's Water Resources Availability Rating is 100.

3) The Surrounding Agricultural Land Rating

Determination of the Surrounding Agricultural Land Rating is based upon identification of a project's Zone of Influence (ZOI), which is defined as that land near a given project, both directly adjoining and within a defined distance away, that is likely to influence, and be influenced by, the agricultural land use of the subject project site. The Surrounding Agricultural Land Rating is designed to provide a measurement of the level of agricultural land use for lands close to a given project. The LESA rates the potential significance of the conversion of an agricultural parcel that has a large proportion of surrounding land in agricultural production more highly than one that has relatively small percentage of surrounding land in agricultural production. The definition of the ZOI that accounts for surrounding lands (up to a minimum of 0.25 mile from the project boundary) is the result of several iterations during model development for assessing an area that will generally be a representative sample of surrounding land use. As shown in Table 3, the Project's Surrounding Agricultural Land Rating is 0.0.

4) The Surrounding Protected Resource Land Rating

The Surrounding Protected Resource Land Rating is essentially an extension of the Surrounding Agricultural Land Rating, and it is scored in a similar manner. Protected resource lands are those lands with long-term use restrictions that are compatible with or supportive of agricultural uses of land.

Included among them are the following:

a. Williamson Act contracted lands
b. Publicly owned lands maintained as a park, forest, or watershed resources
c. Lands with agricultural, wildlife habitat, open space, or other natural resource easements that restrict the conversion of such land to urban and industrial uses

The total area of the ZOI is approximately 328.95 acres and will be used for calculating the Surrounding Agricultural Land Ratings. According to the County of Fresno online

mapping system and Fresno County Assessor data, there is no record of protected resource land within the ZOI. Therefore, based on the surrounding agricultural activities and uses, the Project site's Surrounding Agricultural Land Ratings are 0.

Final LESA Score

A single LESA score is generated for a given project after all the individual LE and SA factors have been scored and weighted. The LESA score is weighted so that 50 percent of the total LESA score of a given project is derived from the LE factors and 50 percent is derived from the SA factors. The final LESA score was determined for the proposed Project and the modeling results are described in Table 3 below.

Table 3
LESA Factors and Weighted Percentages

LESA Factors	Percentages
Land Evaluation Factors	
Land Capability Classification (LCC)	10.0
Storie Index Rating	6.0
Land Evaluation (LE) Subtotal	**16.0**
Site Assessment Factors	
Project Size Rating	0
Water Resource Availability	15.0
Surrounding Agricultural Lands	0.0
Surrounding Protected Resource Lands Rating	0.0
Site Assessment (SA) Subtotal	**15**
Total LESA Factor Weighting	**31.0**

Note: The LESA scoring sheet is provided in Appendix A.

The Project's LESA score is 31.0, which is a comprehensive score for the Project.

California LESA Model Scoring Thresholds

The LESA Model is composed of a Land Evaluation (LE) portion, which measures soil quality, and the Site Assessment (SA) portion, which evaluates parcel size and on-farm investments. The LE and SA subscores are totaled to determine the Final LESA score. A Final LESA Score of 0 to 39 points is not considered significant. A final score between 40 and 59 points is considered significant only if the LE and SA subscores are each greater than or equal to 20 points. A final score between 60 and 79 points is considered significant unless the LE or SA subscores are less than 20 points. A final score between 80 and 100 points is considered significant.

Table 4 below illustrates the California LESA Model Scoring Thresholds for determining the significance of a project's impacts.

Table 4
California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39	Not Considered Significant
40 to 59 Points	Considered Significant only if LE and SA subscores are each greater than or equal to 20 points
60 to 79 Points	Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100 Points	Considered Significant

This determination is based on the results of the California Agricultural LESA prepared for the Project (Appendix A). As shown in Table 3 above, the LESA Model concludes that the Project has a comprehensive score of 31.0 points, which falls within the "Not Considered Significant" scoring decision. Therefore, there is a less than a significant environmental impact due to the overall size of the Project. The LESA Model concludes that the conversion of the approximately 30.3 acres of Farmland of Local Importance to a non-agricultural use would constitute a **less than significant impact**.

b) Conflict with existing zoning for agricultural use or a Williamson Act contract?

The Project site is not subject to a Williamson Act land use contract, has a land use designation of Residential Medium Density (5.0-12 D.U./acre) and is zoned RS-5 (Residential Single-Unit, Medium Density). Medium Density allows for 5 to 12 dwelling units per acre. The RS-5 zoning district does allow agricultural uses, but would not be considered the primary use of the parcel as the purpose of this zoning district is to provide for a variety of single-unit residences built to urban or suburban standards to suit a spectrum of individual lifestyles and needs, and to ensure availability throughout the city of the range of housing types necessary for all segments of the community, consistent with the General Plan. The Project site is not in an existing Williamson Act contract. Therefore, development of the proposed Project would not conflict with existing zoning for agricultural use or a Williamson Act contract and would have **no impact**.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

The Project site is located within an increasingly urban area and is located within a residential zoning district (RS-5). Pursuant to Public Resources Code (PRC) section 12220(g)), "forest land" is land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. PRC Section 4526 defines timberland as "land, other than land owned by the federal government and land designated by the State Board of Forestry as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species

used to produce lumber and other forest products. The Project site is currently an open field, which does not meet the criteria to be defined as forest land or timberland.

Therefore, the proposed Project would not conflict with the existing zoning for, or cause rezoning of, forest land or conversion of forest land to non-forest uses. Therefore, the proposed Project would have **no impact.**

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Please refer to the discussion for (c) above. The proposed Project would not result in the loss of forest land or conversion of forest land to non-forest uses because the Project site is located in a largely urbanized area and is currently vacant. Therefore, the proposed Project would have **no impact.**

e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Please refer to the discussion for Impact AGRICULTURE AND FORESTRY RESOURCES (a) and (c) above.

The Project site is classified as Farmland of Local Importance by the DOC FMMP, but is located in a largely urbanized area and is currently vacant so it would not result in conversion of forest land to non-forest use. While the Project would convert 30 acres of Farmland of Local Importance, the LESA prepared for this Project generated a Final LESA score of 31.0, which is considered a **less than significant impact** (QK, 2025a).

Mitigation Measure

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan (*e.g.*, by having potential emissions of regulated criterion pollutants which exceed the San Joaquin Valley Air Pollution Control Districts (SJVAPCD) adopted thresholds for these pollutants)?			X	
b) 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)?			X	
c) Expose sensitive receptors to substantial pollutant concentrations?			X	
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

The analysis in this section is substantiated by an Air Quality Impact Analysis (QK, 2025b), an Air Quality and Greenhouse Gas Analysis Report (Mitchell Air Quality Consulting, 2020) and a Traffic Impact Study (Peters Engineering Group, 2020), prepared for the Project and is attached as Appendix B and Appendix F, respectively.

DISCUSSION

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

Air Quality Attainment Plans (AQAP) Consistency

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is responsible for monitoring and regulating air pollutant emissions from stationary, area, and indirect sources within Fresno County. This includes monitoring air quality and setting and enforcing limits for source emissions. The SJVAPCD has adopted numerous air quality plans, including the 2022 Ozone Plan, 2016 Ozone Plan, 2013 1-Hour Ozone Plan, 2007 PM_{10} Maintenance Plan, and 2024 Plan for the 2012 Annual $PM_{2.5}$ Standard to assure attainment of EPA Ozone, PM_{10} and $PM_{2.5}$ standards. These air quality plans were created to bring the SJVAB into compliance with the requirements of the federal and state standards. Consistency with the SJVAPCD's air quality plan(s) would ensure a project is not in conflict with or obstructing the implementation of the air quality plan(s). A project would be consistent with the SJVAPCD's air quality plan(s) if the pollutants emitted from construction and operation of the project would not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. The SJVAPCD established the significance thresholds identified in SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI) for purpose of determining if a project will have a significant air quality impact.

The California Clean Air Act (CCAA), Division 26 of the California Health and Safety Code, and AQAP identify transportation control measures as methods to further reduce emissions from mobile sources. Strategies identified to reduce vehicular emissions such as reductions in vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, and traffic congestion, in order to reduce vehicular emissions, can be implemented as control measures under the CCAA as well. Additional measures may also be implemented through the building process, such as providing electrical outlets on exterior walls of structures to encourage the use of electrical landscape maintenance equipment or measures such as electrical outlets for electrical systems on diesel trucks to reduce or eliminate idling time.

Under the provisions of the U.S. Clean Air Act, the Fresno County portion of the San Joaquin Valley Air Basin (SJVAB) has been classified as non-attainment/extreme, non-attainment/severe, non-attainment, attainment/ unclassified, attainment, or unclassified under the established National Ambient Air Quality Standard (NAAQS) and California Ambient Air Quality Standard (CAAQS) for various criteria pollutants. Table 5 provides the SJVAB's designation and classification based on the various criteria pollutants under both NAAQS and CAAQS.

Table 5
SJVAB Attainment Status

Pollutant	NAAQS[a]	CAAQS[b]
Ozone – 1 Hour	No Federal Standard[f]	Non-attainment/Severe
Ozone – 8 Hour[8]	Non-attainment/Extreme[e]	Non-attainment
PM_{10}	Attainment[c]	Non-attainment

$PM_{2.5}$	Non-attainment[d]	Non-attainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead Particulates	No Designation/Classification	Attainment
H_2S	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particulates	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

[*Source*: SJVAPCD 2025a
Notes:

a. See 40 CFR Part 81
b. See CCR Title 17 Sections 60200-60210
c. On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM_{10} National Ambient Air Quality Standard (NAAQS) and approved the PM_{10} Maintenance Plan.
d. The Valley is designated non-attainment for the 1997 $PM_{2.5}$ NAAQS. EPA designated the Valley as non-attainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).
e. Though the Valley was initially classified as serious non-attainment for the 1997 8-hour O_3 standard, EPA approved Valley reclassification to extreme non-attainment in the Federal Register on May 5, 2010 (effective June 4, 2010).
f. Effective June 15, 2005, the EPA revoked the federal 1-hour O_3 standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme non-attainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour O3 non-attainment areas continue to apply to the SJVAB.

Table 6 outlines the SJVAPCD's adopted thresholds, for a project that would not individually cause a significant impact, the project's contribution to any cumulative impact may be considered less than significant, provided that the project is consistent with all applicable regional air quality plans.

Table 6
SJVAPCD CEQA Thresholds of Significance

Criteria Pollutant	Construction Emissions	Permitted Equipment and Activities	Non-Permitted Equipment and Activities
NOx	10 tons/yr	10 tons/yr	10 tons/yr
ROG	10 tons/yr	10 tons/yr	10 tons/yr
SOx	27 tons/yr	27 tons/yr	27 tons/yr
PM_{10}	15 tons/yr	15 tons/yr	15 tons/yr
$PM_{2.5}$	15 tons/yr	15 tons/yr	15 tons/yr
CO	100 tons/yr	100 tons/yr	100 tons/yr

Source: SJVAPCD, 2015.

Construction

The Project's construction and operational emissions were calculated using the California Emissions Estimator Model (CalEEMod). CalEEMod is a Statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model is an accurate and comprehensive tool that is accepted in California as a way to quantify air quality impacts from land use projects throughout the State. Short-term emissions from the construction phases of a project would have temporary impacts on air quality (QK, 2025b).

Table 7 presents the Project's short-term emissions based on the anticipated construction period. As calculated with CalEEMod, the total estimated construction-related emissions would not exceed SJVAPCD significance threshold levels and would, therefore, be less than significant.

Table 7
Project Construction Emissions

Emissions Source	Pollutant (tons/year)					
	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction 2026	0.125	1.084	1.184	0.002	0.160	0.091
Construction 2027	0.166	1.296	1.939	0.003	0.100	0.054
Construction 2028	0.791	1.097	1.711	0.003	0.082	0.044
Construction 2029	0.514	0.006	0.011	0.000	0.001	0.000
Significance Threshold	10	10	100	27	15	15
Total	1.596	3.483	4.845	0.008	0.343	0.189
Is Threshold Exceeded?	No	No	No	No	No	No

Source: **(QK, 2025b)**

Results of the analyses above and below show that emissions generated during construction and operation of the Project will not exceed the SJVAPCD emission thresholds for criteria pollutants, and impacts would be less than significant.

Operational (post-construction)

Upon full build-out, long-term emissions are caused by operational mobile sources and area source emissions from residences.

Project-related transportation activities from residents would generate mobile source ROG, NOx, SOx, CO, PM_{10}, and $PM_{2.5}$ exhaust emissions. Exhaust emissions would vary substantially from day to day but would average out over the course of an operational year. The variables factored into estimating total Project emissions include level of activity, site characteristics, weather conditions, and number of visitors. As the Project is not expected to generate an adverse change in current activity levels, substantial emissions are not anticipated. The default trip rates in CalEEMod were used along with an adjusted fleet mix to reflect SJVAPCD approved residential fleet mix for year 2026.

The proposed Project is expected to generate operational emissions as shown in Table 8.

Table 8
Post-Project Max Year (Operational Emissions)

Emissions Source	Pollutant (tons/year)					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Operational Emissions	2.57	1.18	8.34	0.02	1.60	0.43
SJVAPCD Threshold	10	10	100	27	15	15
Is Threshold Exceeded?	No	No	No	No	No	No

Source: (QK, 2025b)

As indicated in Tables 7 and 8 above, the proposed Project would generate less than significant impacts to criteria air pollutants. Air quality impact analysis show that emissions generated from construction and operation of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants; therefore, the Project's incremental contribution to cumulative air quality impacts would not be cumulatively considerable (CEQA Guidelines Section 15064(h)(3) (QK, 2025b).

As discussed above, the Project will not conflict with or obstruct implementation of the applicable air quality plans because the Project is below the ambient air quality screening thresholds. As a result, the Project impacts would be **less than significant** and no mitigation is needed.

b) 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?

The Fresno County area is nonattainment for federal and State air quality standards for ozone, in attainment for Federal standards and nonattainment for State standards for PM_{10}, and nonattainment for federal and State standards for $PM_{2.5.}$ SJVAPCD's approach

to assessing cumulative impacts dictates that a project's contribution to cumulative impacts to regional air quality would be considered potentially significant if the project's impact would be individually significant (i.e., exceeds the SJVAPCD's quantitative thresholds). For a project that would not individually cause a significant impact, the project's contribution to any cumulative impact may be considered less than significant, provided that the project is consistent with all applicable regional air quality plans.

As discussed above, the Project's construction and operational emissions are shown not to exceed adopted air district thresholds. Table 6 outlines the SJVAPCD's adopted thresholds, Table 7 shows the Project's construction emissions, and Table 8 shows long term operational emissions. All emissions are expected to be under adopted thresholds. Furthermore, the proposed Project is subject to the SJVAPCD's Indirect Source Review (ISR) program since there are more than 50 residential units planned for development at the site, which is also known as Rule 9510. Rule 9510 and the Administrative ISR Fee Rule (Rule 3180) are the result of State requirements outlined in the California Health and Safety Code, Section 40604, and the State Implementation Plan (SIP). The purpose of the SJVAPCD's ISR program is to reduce emissions of NOx and PM10 from new projects. In general, new development contributes to the air pollution problem in the Valley by increasing the number of vehicles and vehicle miles traveled. The total cost of emission reductions for the Project will be established during the formal ISR review process, utilizing the SJVAPCD's ISR Fee Estimator calculator as the basis for calculation.

Naturally Occurring Asbestos (NOA)

The proposed Project's construction phase may cause NOA to become airborne due to the construction activities that will occur on site. The Project would be required to submit a Dust Control Plan under the SJVAPCD's Rule 8021 and comply with SJVAPCD regulations to reduce short term construction impacts.

Cumulative CO Impacts

The SJVAPCD's GAMAQI has identified CO impacts from impacted traffic intersections and roadway segments as being potentially cumulatively considerable. Traffic increases and added congestion caused by a project can combine to cause a violation of the SJVAPCD's CO standard, also known as a "hotspot." There are two criteria established by the GAMAQI by which CO "hotspot" modeling is required:

1. A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity would be reduced to LOS E or F.
2. A traffic study indicates that the project would substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity.

A Traffic study was completed for this Project (Peters Engineering Group, 2020). According to the traffic study, the Project alone does not cause impacted intersections

and roadway segments to drop below LOS D. Therefore, CO "hotspot" modeling was not conducted for this Project, and no concentrated excessive CO emissions are expected to be caused once the proposed Project is completed.

As noted above, the Project's construction and operational impacts all fall well below the adopted SJVAPCD threshold for any criteria pollutant emissions. Therefore, Project impacts related to any potential for 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 are considered **less than significant.**

c) Expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors are defined as locations where young children, chronically ill individuals, the elderly, or people who are more sensitive than the general population reside or frequent, such as schools, hospitals, nursing homes, and daycare centers. The nearest residential sensitive receptor to the proposed Project is located adjacent to portions of the Project's sites. Table 9 lists the known non-residential sensitive receptors within one mile of the Project site.

Table 9
Sensitive Receptors Located < 1 miles from Project

Receptor	Type of Facility	Distance from Project (miles)	Direction from Project
Brighten Academy Preschool Grantland	Preschool	0.15	North
Harvest Elementary School	School	0.78	South
Herndon-Barstow Elementary School	School	0.76	North
Justin Garza Highschool	School	0.93	South
Penny & Bear Family Childcare	Daycare	0.42	East
Loving Hands Care Home	Assisted Living	0.50	East

Source: (QK, 2025b)

The first step in evaluating the potential for impacts to sensitive receptors for toxic air contaminants (TAC) from the Project is to perform a screening level analysis. For Type B Projects, one type of screening tool is found in the CARB *Handbook: Air Quality and Land Use Handbook: A Community Perspective*. This handbook includes a table with recommended buffer distances associated with various types of common sources. The screening level analysis for the Project shows that TACs are not a concern for the Project (VRPA, 2024). An evaluation of nearby land uses considering CARB's Pollution Mapping Tool shows that the Project will not place sensitive receptors in the vicinity of existing toxic sources and is not within 500 feet of a freeway/urban roads with 100,000 vehicles/day, or on rural roads with 50,000 vehicles/day. The Project is located almost one mile from SR 99.

Hazardous Air Pollutant (HAP) Impacts

GAMAQI recommends that Lead Agencies consider situations wherein a new or modified source of HAPs is proposed for a location near an existing residential area or other sensitive receptors when evaluating potential impacts related to HAPs.

The proposed Project would result in emissions of HAPs from construction activities and would be located near existing residents; therefore, an assessment of the potential risk to the population attributable to emissions of hazardous air pollutants from the proposed Project is required.

To predict the potential health risk to the population attributable to emissions of HAPs from the proposed Project, ambient air concentrations were predicted with dispersion modeling to arrive at a conservative estimate of increased individual carcinogenic risk that might occur as a result of continuous exposure over the construction period for construction emissions. Similarly, predicted concentrations were used to calculate non-cancer chronic and acute hazard indices, which are the ratio of expected exposure to acceptable exposure. The basis for evaluating potential health risks is the identification of sources with increased HAPs. HAP emissions from anticipated on-site construction activities were evaluated.

Health risk is determined using the Hotspots Analysis and Reporting Program (HARP) software distributed by the CARB. HARP2 requires peak 1-hour emission rates and annual-averaged emission rates for all pollutants for each modeling source. The assumptions used to calculate the emission rates for the proposed Project are outlined in Appendix B (QK, 2025b). Diesel combustion emissions from diesel on-site construction equipment were modeled as an area source for on-site construction activity on the property. Diesel particulate matter was calculated using CalEEMod for on-site construction.

SJVAPCD has set the level of significance for carcinogenic risk at twenty in one million, which is understood as the possibility of causing 20 additional cancer cases in a population of one million people. The level of significance for chronic non-cancer risk is a hazard index of 1.0. All receptors were modeled with a 3-year exposure for construction activities.

The carcinogenic risk and the health hazard index (HI) for chronic non-cancer risk at the point of maximum impact (PMI) do not exceed the significance levels of 20 in one million (20 x 10-6) and 1.0, respectively, for the proposed Project. The PMIs are identified by receptor location and risk and are provided in Table 10. The electronic AERMOD and HARP2 output files are provided in Appendix B.

Table 10
Potential Maximum Impacts Predicted by HARP

	Cancer Risk	Chronic Hazard Index
Construction	5.12E-06	2.69E-03
SJVAPCD Threshold	20.0E-06	1.0
Exceedance?	No	No
Receptor #	215	215
UTM Easting (m)	240253.81	240253.81
UTM Northing (m)	4078000.35	4078000.35

Source: **(QK, 2025b)**
Note: UTM = Universal Transverse Mercator

As shown above in Table 10, the maximum predicted cancer risk for the proposed Project is 5.12E-06. The maximum chronic non-cancer hazard index for the proposed Project is 2.69E-03. Since the PMI remained below the significance threshold for cancer and chronic risk, this Project would not have an adverse effect to any of the surrounding communities.

The potential health risk attributable to the proposed Project is determined to be less than significant based on the following conclusions:

1. Potential carcinogenic risk from the proposed Project is below the significance level of twenty in a million at each of the modeled receptors.
2. The hazard index for the potential chronic non-cancer risk from the proposed Project is below the significance level of 1.0 at each of the modeled receptors.
3. The hazard index for the potential acute non-cancer risk was not calculated since there is no acute risk associated with Diesel Particulate Matter (DPM) emission; therefore, the proposed Project is considered below the significance level.

The potential risk to the population attributable to emissions of HAPs from the proposed Project would be less than significant.

As discussed above and analyzed in the technical studies prepared for this Project, the Project's HAP emissions will be less than the SJVAPCD threshold and therefore, will not Expose sensitive receptors to substantial pollutant concentrations (QK, 2025b) (Peters Engineering Group, 2020). The Project impacts are considered **less than significant.**

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc., warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas.

The proposed Project is a residential community located near other residential neighborhoods and agricultural land uses. The Project will not generate odorous emissions given the nature or characteristics of the Project. The intensity of an odor source's operations and its proximity to sensitive receptors influence the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJVAB.

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. According to the California Supreme Court's ruling in *California Building Industry Assn. v. Bay Area Air Quality Management Dist.*, impacts of existing sources of odors on the Project are not subject to CEQA review. (*CBIA v. BAAQMD.* (2015) 62 Cal.4th 369, 386.). Therefore, the analysis to determine if the Project would locate new sensitive receptors near an existing source of odor is provided for information only. The SJVAPCD has determined the common land use types that are known to produce odors in the Air Basin and requires that an analysis of potential odor impacts be conducted for the following two situations:

- Generators – projects that would potentially generate odorous emissions proposed to be located near existing sensitive receptors or other land uses where people may congregate.

- Receivers – residential or other sensitive receptor projects or other projects built for the intent of attracting people located near existing odor sources.

Project as a Generator

The proposed Project will not generate odorous emissions given the nature or characteristics of residential development. The intensity of an odor source's operations and its proximity to sensitive receptors influence the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJVAB. The types of facilities that are known to produce odors are shown in Table 11 below, along with a reasonable distance from the source within which the degree of odors could possibly be significant.

Table 11
Screening Levels for Potential Odor Sources

Type of Facility	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile

Painting/Coating Operations (e.g., auto body shops)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile

Source: SJVAPCD 2025

Because the Project's anticipated land uses and activities are not listed in the GAMAQI as a source that would create objectionable odors, the Project is not expected to be a source of objectionable odors (QK, 2025b).

Project as a Receiver

With the *CBIA v. BAAQMD* ruling, analysis of odor impacts on receivers is not required for CEQA compliance (Mitchell Air Quality Consulting, 2020). Therefore, the following analysis is provided for information only.

As a residential development, the project has the potential to place sensitive receptors near existing odor sources. There are no major odor-generating sources, as listed in Table 11 within screening distance of the site (Mitchell Air Quality Consulting, 2020). Therefore, the uses in the vicinity of the project would not cause substantial odor impacts to the project. Therefore, impacts are less than significant, and no mitigation is needed.

In conclusion, the Project will not result in any significant impacts related to odors, and the Project impacts are considered **less than significant.**

Mitigation Measure

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES – Would the Project:				
a) 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. Fish and Wildlife Service?		X		
b) 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 US Fish and Wildlife Service?			X	
c) 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?			X	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

The analysis in this section is substantiated by Biological Resources Evaluation (QK, 2025c), prepared for the Project and is attached as Appendix C.

DISCUSSION

a) 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 Wildlife or the U.S. Fish and Wildlife Service?

Reconnaissance-Level Field Survey

A reconnaissance-level field survey of the Project site and a 250-foot buffer (Biological Survey Area, or BSA), where feasible, was conducted on October 15, 2025, by qualified biologists (QK, 2025c). The survey consisted of meandering pedestrian transects spaced 50 to 100 feet apart throughout the BSA, where accessible. Areas with suitable habitat that could not be accessed, such as private residences or adjacent agricultural fields, were surveyed by use of high-power binoculars.

Tasks completed during the survey included determining and documenting current land use, developing an inventory of plant species, wildlife species, and wildlife sign (e.g., scat, burrows, nests, feathers, tracks, etc.), characterizing vegetation associations and habitat conditions within the BSA, assessing the potential for federal, State-listed and other special-status plant and wildlife species that may occur on and near the Project site based on existing conditions, and assessing the potential for migratory birds and raptors to nest on and near the Project site.

Literature Review

A review of the literature and agency databases was conducted to obtain information on the occurrences of natural communities and special-status species known in the vicinity of the Project site. The California Natural Diversity Database (CNDDB), the California Native Plant Society (CNPS) Database and the U.S. Fish and Wildlife Service (USFWS) Information for Planning (IPac) threatened and endangered and special-status species lists were reviewed. The CNDDB and CNPS queries focused on the *Herndon* USGS 7.5-minute quadrangle in which the Project is located, plus the surrounding eight quadrangles: *Madera, Gregg, Lanes Bridge, Biola, Fresno North, Kerman, Kearney Park,* and *Fresno South.* To satisfy other standard search criteria, CNDDB records within a 10-mile radius of the Project site were queried separately from the broader database search.

Site Conditions

Site conditions from the reconnaissance-level field survey were documented with representative photographs, which are available in Appendix C. The Project site is a 30-acre parcel that consists of an orchard where the trees have been uprooted for removal. The rest of the site is recently disked non-native grasslands. There were no sensitive vegetative communities or special-status plant species observed. The urban development surrounding the Project site contains valley oak (*Quercus lobata*) and various ornamental shrubs and trees including pines (*Pinus* sp.) and sycamore (*Platanus* sp.) within the BSA.

There are several large trees within the BSA that could support nesting birds and/or raptors, but no nests were observed during the site visit which was conducted outside of the nesting bird season. Smaller ornamental trees associated with the private residences surrounding the Project site could support nesting passerine bird species. Common migratory bird species observed during the survey included mourning dove (*Zenaida macroura*) and common raven (*Corvus corax*). A red-tailed hawk (*Buteo jamaicensis*) was observed perching on a utility pole within the BSA.

Small mammal burrows are present within the BSA and Project site in the orchard, non-native grasslands, and on both banks of the Herndon Canal. Numerous California ground squirrels (*Otospermophilus beecheyi*) and desert cottontails (*Sylvilagus audubonii*) were observed in the orchard. No dens suitable for special-status species such as San Joaquin kit fox (*Vulpes macrotis*), American badger (*Taxidea taxus*), and western burrowing owl (*Athene cunicularia hypugaea*) were present within the BSA. Signs (den, burrow, scat, tracks, etc.) of domestic dog (*Canis familiaris*), deer mouse (*Peromyscus maniculatus*), and coyote (*Canis latrans*) were observed in the Project site.

Special-Status Plant Species

Table 12 lists fifteen (15) special-status plant species identified in the literature and database review that are known or have the potential to occur within the surrounding nine-quadrangles centered on the Project site.

Table 12
Special-Status Plant Species Known to Occur in the Region of the BSA

Scientific Name	Common Name	Status
Atriplex cordulata var.	heartscale	1B.2
Atriplex minuscula	lesser saltscale	1B.1
Caulanthus californicus	California jewelflower	FE, SE,
Chloropyron palmatum	palmate-bracted bird's beak	FE, SE,
Delphinium recurvatum	recurved larkspur	1B.2
Eryngium spinosepalum	spiny-sepaled button-celery	1B.2
Imperata breyifolia	California satintail	2B.1
Lasthenia chrysantha	alkali-sink goldfields	1B.2
Layia munzii	Munz's tidy-tips	1B.2
Leptosiphon serrulatus	Madera leptosiphon	1B.2
Navarretia myersii ssp. myersii	pincushion navarretia	1B.1
Orcuttia inaequalis	San Joaquin Valley Orcutt	FT, SE,
Orcuttia pilosa	hairy Orcutt grass	FT, SE,
Puccinellia simplex	California alkali grass	1B.2
Sagittaria sanfordii	Sanford's arrowhead	1B.2

(Source: (QK, 2025c)
FE Federally Endangered
FT Federally Threatened
SE State Endangered
CRPR (California Rare Plant Rank):
1B Rare, Threatened, or Endangered in California and elsewhere.
2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere.
CRPR Threat Code Extension:
.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)

No special-status plant species were present within the BSA. The survey coincided with some, but not all, of the plant species' optimal blooming periods; but none of the species identified in the CNDDB or IPaC database queries are expected to occur on-site due to the lack of suitable habitat conditions (previously disked agricultural field) and/or because the BSA is located outside of the species' known range. The Project site is degraded from historical agricultural uses, and the adjacent lands have been equally disturbed for residential development and as transportation corridors. No special-status plant species were observed during the site survey; therefore, the Project is not anticipated to negatively impact special status plant species.

Special-Status Wildlife Species

Table 13 lists 21 special-status wildlife species identified in the literature and database review that are known or have the potential to occur within the surrounding nine-quad search area centered on the Project BSA. None of the special-status wildlife species have historical CNDDB records occurring on or overlapping the BSA or were observed during the site survey.

Table 13

Special-Status Wildlife Species Known to Occur in the Region of the BSA

Scientific Name	Common Name	Status
Invertebrates		
Bombus crotchii	Crotch's bumble bee	SCE
Danaus plexippus	monarch butterfly	FPT
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT
Aquatic Invertebrates		
Branchinecta lynchi	vernal pool fairy shrimp	FT
Fish		
Mylopharodon conocephalus	hardhead	SSC
Amphibians		
Ambystoma californiense pop 1	California tiger salamander central California DPS	FT, ST, WL
Spea hammondii	western spadefoot	FPT, SSC
Reptiles		
Actinemys marmorata	northwestern pond turtle	FPT,
Anniella pulchra	northern California legless	SSC
Arizona elegans occidentalis	California glossy snake	SSC
Gambelia sila	blunt-nosed leopard lizard	FE, SE,
Phrynosoma blainvillii	coast horned lizard	SSC
Birds		
Agelaius tricolor	tricolored blackbird	ST, SSC
Athene cunicularia hypugaea	burrowing owl	SCE,
Buteo swainsoni	Swainson's hawk	ST
Coccyzus americanus	western yellow-billed cuckoo	FT, SE
Mammals		
Antrozous pallidus	pallid bat	SSC
Dipodomys nitratoides exilis	Fresno kangaroo rat	FE, SE
Eumops perotis californicus	western mastiff bat	SSC
Taxidea taxus	American badger	SSC
Vulpes macrotis mutica	San Joaquin kit fox	FE, ST

Source: (QK, 2025c)
Abbreviations:
FE Federally Endangered
FT Federally Threatened
FPT Federally Proposed Threatened
SE State Endangered
ST State Threatened
SCE State Candidate Endangered
SFP State Fully Protected, CDFW
SSC Species of Special Concern, CDFW
WL Watch List, CDFW

Invertebrates, Aquatic Invertebrates, Fish, Amphibians or Reptiles

There is no suitable habitat nor were special status species invertebrates, aquatic invertebrates, fish, amphibians or reptiles observed in the BSA.

Birds

The BSA lacks suitable habitat for foraging and nesting tricolored blackbirds (*Agelaius tricolor*). The most recent CNDDB occurrence (EONDX 98806) is from 1975 and approximately 8.48 miles east of the Project site.

Western burrowing owls (*Athene cunicularia hypugaea*) inhabit grassland, open bare ground, and utilize existing small mammal burrows, typically created by California ground squirrels (*Otospermophilus beecheyi*), for breeding and shelter. There was no diagnostic sign (e.g., whitewash, tracks, prey remains) of burrowing owl observed during the site survey, although appropriately sized small mammal burrows are present within the BSA. Burrowing owls may be present as transient foragers and may inhabit appropriately sized burrows at any time. No CNDDB records of the western burrowing owl are recorded within 10 miles of the BSA. Implementation of Mitigation Measures BIO-1 through BIO-5 , BIO -7 and BIO-9 would reduce or eliminate impacts to this species.

The BSA provides low quality nesting and moderate quality foraging habitat for Swainson's hawks (*Buteo swainsoni*). There are large trees located within the northern boundary of the BSA, outside of the Project site that could potentially support nesting raptors including Swainson's hawks, but no nests were observed during the survey. California ground squirrels and desert cottontails, both prey species, are numerous throughout the project site. The nearest CNDDB record (EONDX 91594) for Swainson's hawk is from 1956 and approximately 2.76 miles southeast of the Project site. Implementation of Mitigation Measures BIO-1 BIO-3 and BIO-6 would reduce or eliminate impacts to this species.

The BSA does not provide suitable nesting and foraging habitat for western yellow-billed cuckoo (*Coccyzus americanus occidentalis*). There is one historic CNDDB record (EONDX 96983) from 1883 located 7.73 miles northeast of the Project site. The population from the record is presumed extirpated.

Mammals

No suitable foraging or roosting habitat for bats exists within the BSA. Pallid bats (*Antrozous pallidus*) and mastiff bats (*Eumops perotis*) are unlikely to occur within the BSA.

Due to the historic and ongoing disturbance of small mammal burrows and lack of any sign, the BSA cannot support the Fresno kangaroo rat (*Dipodomys nitratoides exilis*). There is no connectivity of suitable habitat between the BSA for kangaroo rat species.

The American badger (*Taxidea taxus*) may be present as transient foragers within the BSA. No diagnostic sign (e.g., tracks, scat, prey remains) or potential dens are present within the BSA; however, California ground squirrels, a prey species for badgers, and burrow complexes are present throughout the BSA. The closest CNDDB record (EONDX 56599) is from 1988 and approximately 1.92 miles northeast of the Project site. Implementation of Mitigation Measures BIO-1, BIO-3, BIO -4, BIO-8 and BIO-9 would reduce or eliminate impacts to this species.

The San Joaquin kit fox (*Vulpes macrotis mutica*) is unlikely to be present within the BSA. The nearest CNDDB record (EONDX 53873) is from 1993 and is 0.69 miles northeast of the Project site. The Project site lacks suitable habitat due to the past and current level of disturbance and the surrounding BSA has been similarly degraded. No San Joaquin kit fox, diagnostic sign (e.g., tracks, scat, prey remains), or potential dens were present within the BSA during the site survey. Implementation of Mitigation Measures BIO-1, BIO-3, BIO -4 and BIO-9 would reduce or eliminate impacts to this species

Nesting Migratory Birds and Raptors

There are five inactive mud swallow nests in the BSA outside of the Project site under Grantland Avenue bridge on the Herndon Canal. These nests will not be impacted by the Project. No other nests were observed, but suitable nesting habitat for mud nesting swallow species is present. The orchard area within the Project site presents suitable habitat for ground nesting species. Migratory birds and raptors could build nests in the large trees, utility poles, and residential landscaping in the BSA surrounding the Project site. Implementation of Mitigation Measures BIO-1 through BIO-3 and BIO-9 would reduce or eliminate impacts to migratory bird species. As a result, Project impacts would be **less than significant with mitigation incorporated**.

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

No sensitive vegetation communities occur within the BSA. The Project would not impact sensitive natural communities. No wetland or non-wetland water features exist on the Project site. The National Hydrography Dataset (NHD) and National Wetlands Inventory (NWI) identify two water features in the surrounding BSA: Herndon Canal, which borders the north side of the Project site, and Epstein Canal, which flows into Herndon Canal from the north (QK, 2025c). The Project is designed to completely avoid these waterways, and neither water feature will be impacted. As a result, Project impacts would be **less than significant**.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct

removal, filling, hydrological interruption, or other means?

As discussed in IV. BIOLOGICAL RESOURCES b), there are no wetland or non-wetland water features on the Project site. The NHD and NWI identify two water features in the surrounding BSA, the Herndon Canal and Epstein Canal. The Project is designed to completely avoid these waterways, and neither water feature will be impacted. As a result, there would be **less than significant impact** on federally or State protected wetlands or waterways as a result of the proposed Project.

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

Wildlife migratory corridors are described as a narrow stretch of land that connects two open pieces of habitat that would otherwise be unconnected. These routes provide shelter and sufficient food supplies to support wildlife species during migration. Movement corridors generally consist of riparian, woodlands, or forested habitats that span contiguous acres of undisturbed habitat and are important elements of resident species' home ranges.

The BSA is not within any designated wildlife linkage or movement corridors. The nearest wildlife movement corridor is located approximately 15.38 miles northeast of the BSA and the nearest wildlife linkage area is approximately 17.50 miles northwest. The Project is in an area developed for urban and agricultural use and does not provide a linkage between suitable natural habitats for most wildlife species. Due to the disturbed condition of the Project and surrounding area, there is no substantial movement of wildlife onto or off the BSA.

As previously mentioned in IV. BIOLOGICAL RESOURCES a), there are five inactive mud swallow nests in the BSA outside of the Project site under Grantland Avenue bridge on the Herndon Canal. These nests will not be impacted by the Project. No other nests were observed, but suitable nesting habitat for mud nesting swallow species is present. The orchard area within the Project site presents suitable habitat for ground nesting species. Migratory birds and raptors could build nests in the large trees, utility poles, and residential landscaping in the BSA surrounding the Project site. Implementation of Mitigation Measures BIO-1 through BIO-3 and BIO-9 would reduce or eliminate impacts to migratory bird species to a less than significant level. Therefore, the Project impacts would be **less than significant with mitigation**.

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

The proposed Project would not conflict with any local policies or ordinances protecting biological resources because the Project site is a recently disced site which was previously an orchard, but no longer contains trees. The proposed Project would comply with all applicable regulations and would not conflict with any local policies or

ordinances protecting biological resources. As a result, the impact would be **less than significant.**

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

The Pacific Gas & Electric (PG&E) San Joaquin Valley Operation and Maintenance (O&M) Habitat Conservation Plan (HCP) was approved in 2007 and covers portions of nine counties, including Fresno County. This HCP covers PG&E activities which occur as a result of ongoing operations and maintenance and provides incidental take coverage from the USFWS and CDFW. However, this Project is not a PG&E project, therefore this Project is not covered by the PG&E Incidental Take Permit (ITP) and is not pertinent.

The Project site is not located within the covered area of any HCP, Natural Community Conservation Plan (NCCP), or other adopted local, regional or State ITP or HCP. Therefore, the Project would have **no impact**.

Mitigation Measures

The proposed project shall implement and incorporate, as applicable, the biological resources related mitigation measures identified below.

BIO-1: A pre-construction clearance survey of the Project footprint shall be conducted for special-status wildlife species and nesting migratory birds and raptors. The survey shall occur no less than 14 days prior to the start of construction activities. If construction is delayed beyond 30 days from the time of the survey, then another survey would need to be conducted. The survey shall be conducted by a biologist with adequate training and prior experience conducting surveys for special-status wildlife species. If no special-status species are observed, no further action is warranted. If dens or burrows that could support special-status species and/or nesting birds and raptors are discovered during the pre-construction survey, appropriate avoidance buffers shall be established. If no special-status species are observed on or near the Project site, no further surveys are required. A report outlining the results of the pre-construction survey shall be submitted to the lead agency as evidence of compliance.

BIO-2: If construction is planned during the nesting season for migratory birds (February 15 to August 31) and nesting birds are identified during the survey, active Swainson's hawk nest shall be avoided by 0.5 miles, other raptor nests shall be avoided by 500 feet and all other migratory bird nests shall be avoided by 250 feet. Avoidance buffers may be reduced if a qualified biological monitor determines that encroachment into the buffer area is not affecting nest building, the rearing of young, or otherwise affecting the breeding behaviors of the resident birds. Because nesting birds can establish new nests or produce a second or even third clutch at any time during the nesting season, nesting bird surveys shall be repeated every 30 days as construction activities are occurring throughout the

nesting season. If no nesting birds are observed on or near the Project site, no further surveys are required.

BIO-3: A Worker Environmental Awareness Program shall be developed and implemented for all personnel that could access the site prior to commencing any disturbance activities. The program shall consist of an on-site or center presentation that will describe the locations and types of sensitive plant, wildlife, and sensitive natural communities (collectively, "Biological Resources") on and near the site, an overview of the laws and regulations governing the protection of Biological Resources, the reasons for protecting the Biological Resources, the specific protection and avoidance measures that are applicable to the site, and the identity of designated points of contact should questions or issues arise, including the qualified biologist. The program shall provide training to recognize, avoid, and report to applicable qualified biologists any Biological Resources on the site.

a. The Worker Environmental Awareness Program shall emphasize the need to avoid contact with on-site wildlife and avoid entry into areas where Biological Resources have been identified based on pre-disturbance field surveys, and to implement the buffer avoidance or other protection measures established by the United States Fish and Wildlife Service, identified by the California Department of Fish and Wildlife, or required by the Biological Resource mitigation measures. The training shall emphasize the importance of not feeding or domesticating wildlife and the need to avoid any trash, micro trash, or potential food disposal on-site except in animal-proof containers emptied daily to avoid attracting or causing adverse impacts to special status wildlife.
b. All on-site personnel must sign a statement verifying that they have completed the Worker Environmental Awareness Program and that they understand and agree to implement the biological requirements for the worksite. If signed employee statements are not available, documentation may be provided by Worker Environmental Awareness Program training records, which shall be kept by the applicant for a minimum of five years. Each applicant shall maintain a list of all persons who have completed the training program and shall provide the list to the County or to State and federal wildlife agency representatives upon request.

BIO-4: If protected or special-status species are identified on the Project site during pre-construction surveys, protective buffers shall be used, where effective in the opinion of the qualified biologist. These measures are created to avoid any unauthorized incidental take of these species and to minimize any incidental take. Protective buffers shall be delineated using brightly colored stakes and/or flagging or similar materials and remain until construction activities are complete, at which time of completion, the buffers must be removed. Protective buffers shall be established around active dens and/or burrows of special-status animal species or populations of special-status plant species to avoid unauthorized take of protected species as listed in the table below. The protective buffer distance shall be increased if required to avoid unauthorized incidental take of any protected species as determined by a qualified biologist. Protective buffer distances and other avoidance measures that may be implemented to avoid impacts to protected species or sensitive species shall be consistent with the United States Fish and Wildlife

Service and/or the California Department of Fish and Wildlife requirements and shall be implemented and overseen by the qualified biologist. If occupied San Joaquin kit fox dens cannot be avoided by the appropriate buffer below, an ITP issued by the CDFW under the California Endangered Species Act (CESA) to authorize "take" that is incidental to an otherwise lawful activity, may be required before any work within the buffer.

Disturbance Buffers for Sensitive Resources

Sensitive Resource	Buffer Zone from Disturbance (feet)
Potential San Joaquin kit fox den	50
Known San Joaquin kit fox den	100
Natal San Joaquin kit fox den	500
Atypical San Joaquin kit fox den	50
Rodent burrows	50
Special-status bird species' active nests	500 feet to 0.5 miles depending on species and sight line
American badger: Non-maternity dens	50
American badger: Maternity dens	200

BIO-5: If Project activities must occur during the Swainson's hawk nesting season (February 15 to September 31), pre-activity surveys shall be conducted for Swainson's hawk nests in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (CDFG 2000).).* The surveys would be conducted on the Project site plus a 0.5-mile buffer. To meet the minimum level of protection for the species, surveys shall be conducted during at least two survey periods prior to the start of construction. The survey will be conducted in accordance with the methodology outlined in existing protocols and shall be phased with the construction of the Project. If no Swainson's hawk nests are found, no further action is required.

BIO-6: If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist shall complete an assessment of the potential for current construction activities to impact the nest. The assessment would consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this Project. Based on this assessment, the biologist will determine if construction activities can proceed and the level of nest monitoring required. Construction activities shall not occur within 500 feet of an active nest, but depending upon conditions at the site, this distance may be reduced. Full-time monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist shall have the authority to stop work if it is determined that Project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nesting Swainson's hawk to disturbances and at the discretion of the qualified biologist.

BIO-7: If burrows that could support this species are discovered during the pre-construction clearance survey conducted under Measure BIO-1, the avoidance buffers

outlined below should be established, and burrow monitoring shall be conducted in accordance with the California Department of Fish and Game (CDFG) *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). No work shall occur within these buffers. If occupied burrowing owl burrows cannot be avoided by the appropriate buffer below, an ITP issued by the CDFW under the California Endangered Species Act (CESA) to authorize "take" that is incidental to an otherwise lawful activity, may be required before any work within the buffer.

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1 -Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16 – Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16- Mar 31	50 m	100 m	500 m

*Meters (m)

BIO-8: Occupied American badger dens detected during pre-disturbance surveys shall be flagged, and ground-disturbing activities avoided within 50 feet of the den. Maternity dens shall be avoided, and a minimum 200-foot buffer from disturbance shall be maintained during the pup-rearing season (February 15 through July 1). Maternity dens must be avoided to the maximum extent feasible in the opinion of a qualified biologist. If an active maternity den is proposed to be disturbed, the qualified biologist shall consult with the California Department of Fish and Wildlife to identify any appropriate additional minimization measures which the qualified biologist determines, with the wildlife agencies, can actually be implemented based on field conditions. All such measures shall be implemented for Project activities.

BIO-9: The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Protected and Sensitive Species:

1. All vehicles shall observe a 20-mile-per-hour speed limit in all areas of disturbance and on unpaved roads unless otherwise posted. Off-road traffic outside of designated access routes is prohibited. Speed limit signs shall be posted in visible locations at the point of site entry and at regular intervals on all unpaved access roads.
2. All disturbance activities, except emergency situations or drilling that may require continuous operations, shall only occur during daylight hours. Nighttime disturbance activity for drilling purposes shall use directed lighting and shielding methods and comply with applicable lighting mitigation measures.
3. All food-related trash items and all forms of micro trash, such as wrappers, cans, bottles, bottle tops, and food scraps, shall be disposed of in closed, animal-proof containers and removed daily from the site.
4. Excavations, spoils piles, access roadways, and parking and staging areas shall be subject to dust control as set forth in the dust control mitigation measures.
5. The use of herbicides for vegetation control shall be restricted to those approved by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife. No rodenticides shall be used on any site unless approved by the United States Fish and Wildlife Service and the California Department of Fish

and Wildlife and shall observe label and other restrictions mandated by the United States Environmental Protection Agency, California Department of Food and Agriculture, and State and federal laws and regulations. For split estates, no herbicides for vegetation control may occur in Tier 2 areas without surface owner approval.

6. No plants or wildlife shall be collected, taken, or removed from the site or any adjacent locations except as necessary for Project-related vegetation removal or wildlife relocation by a qualified biologist and subject to all applicable permits and authorizations.
7. All open trenches or excavations shall be covered at the end of each workday to prevent wildlife entrapment. If an excavation is too large to cover, escape ramps shall be installed at an incline ratio of no greater than 2:1. All trenches and pipes shall be inspected for the presence of wildlife each day prior to the commencement of work.
8. To enable San Joaquin kit foxes and other wildlife to pass through the Project site, any perimeter fencing shall include a four- to eight-inch opening between the fence mesh and the ground, or the fence shall be raised four inches above the ground except blunt-nosed leopard lizard exclusion fencing. The bottom of the fence fabric shall be knuckled (wrapped back to form a smooth edge) to protect wildlife.
9. All vertical tubes used in Project construction and chain link fencing poles shall be temporarily or permanently capped to avoid the entrapment and death of special-status wildlife and birds. All pipes 1.5 inches or greater in diameter stored overnight on a Project location must have end caps or other physical barriers that prevent wildlife from entering the pipe.
10. All dead or injured special-status wildlife shall be left in place and reported to the United States Fish and Wildlife Service and the California Department of Fish and Wildlife within 48 hours of discovery for rescue or salvage. Discovery of State or federal listed species that are injured or dead shall also be managed consistent with regulatory requirements, including being reported immediately via telephone and within 24 hours in writing, and with a copy to City of Fresno Planning Division.
11. All drilling installations and operations will comply at all times with the applicable federal, State, County, and local law ordinances and regulations.
12. During pre-construction surveys, the qualified biologist shall delineate previously disturbed areas to be used by the applicant to minimize the amount of new disturbance.
13. All concrete and asphalt debris shall be removed from the site for recycling or disposal at an authorized, permitted facility.
14. No vehicles or construction equipment shall be parked within a wetland or waterbody/dry wash.
15. Tracked vehicles and other construction equipment shall be washed or maintained to be weed-free prior to entering and working within areas of a new disturbance.
16. All washing of trucks, paint, equipment, or similar activities shall occur in areas where runoff is fully contained for collection and off-site disposal. Wash water may not be discharged from the site and shall be located at least 100 feet from any water body or sensitive Biological Resources.

17. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries or waterbody, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.
18. All areas that shall be avoided as a result of the pre-disturbance surveys and areas where new disturbance will occur shall be clearly delineated by fencing or staking and flagging and/or rope or cord.
19. No pets shall be allowed on any site.
20. No smoking may occur except in designated areas.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES – Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		
c) Disturb any human remains, including those interred outside of formal cemeteries?		X		

The analysis in this section is substantiated by the Technical Memorandum (QK, 2025d), prepared for the Project and is attached as Appendix D.

DISCUSSION

a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

A historical resource defined by CEQA includes one or more of the following criteria: 1) the resource is listed, or found eligible for listing in, the California Register of Historical Resources (CRHR); 2) listed in a local register of historical resources as defined by PRC Section 5020.1(k); 3) identified as significant in a historical resources survey meeting the requirements of PRC Section 5024.1(g); or 4) determined to be a historical resource by the Project's lead agency (PRC Section 21084.1; CEQA Guidelines Section 15064.(a)). Under CEQA, historical resources include built-environment resources and archaeological sites.

A cultural resource records search (#25-405) was conducted at the Southern San Joaquin Valley Information Center at California State University, Bakersfield (QK, 2025d).The records search covered an area within one-half mile of the project and included a review of the *National Register of Historic Places, California Points of Historical Interest, California Registry of Historic Resources, California Historical Landmarks, California State Historic Resources Inventory*, and cultural resource reports on file.

The records search indicated that the Project site had never been surveyed for cultural resources, and it is not known if any exist on it.

Six cultural resource studies have been conducted within a half mile of the Project. Twelve historic-era cultural resources have been recorded within one half mile of the project. These include a segment of the Herndon Canal which runs adjacent to the northern project boundary, the Epstein Canal, and ten residential and commercial buildings that date prior to 1980. All of which will not be impacted by the proposed development of the Project. No additional cultural resources have been identified within half a mile of the project.

A Sacred Lands File request was also submitted to the Native American Heritage Commission (NAHC). A response dated September 30, 2025, indicates negative results (Appendix D).

Currently, the Table Mountain Rancheria Tribe and the Dumna Wo Wah Tribe have requested to be notified pursuant to AB 52. A certified letter was mailed to the above mentioned tribes on February 12, 2026. The 30-day comment period ended on March 16, 2026. To date, no responses have been sent to the City. Should the City receive communication with a tribal group, they will work in good faith to address any potential cultural resources concerns.

The cultural resource technical memorandum did not identify any historical resources within the Project area and historical resources identified within a half-mile of the Project will not be impacted by Project development.

Based on the results of cultural records search findings and the lack of historical or archaeological resources previously identified within a half-mile radius of the proposed Project, the potential to encounter subsurface cultural resources is minimal. Additionally, the Project construction would be conducted within a previously disturbed parcel. The Project would not impact the cultural resource properties that are within the vicinity. The potential to uncover subsurface historical or archaeological deposits would be considered unlikely.

The Project site is currently undeveloped and was historically in agricultural production. If any artifacts are inadvertently discovered during ground-disturbing activities, existing federal, State, and local laws and regulations as well as the Mitigation Measure CUL-1, will require construction activities to cease until such historical artifacts are properly examined and determined not to be of significance by a qualified cultural resource professional.

In conclusion, with mitigation measures incorporated, the Project will not result in any significant impacts related to historical or archaeological resources. The Project impacts are considered **less than significant with mitigation incorporated**.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

According to the CEQA Guidelines, “When a Project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource” (CEQA Guidelines Section 15064.5(c)(1)). Those archaeological sites that do not qualify as historical resources shall be assessed to determine if these qualify as “unique archaeological resources” (California PRC Section 21083.2). No archaeological resources were identified in the Project site. However, due to the nominal amount of archaeological information within the majority of the City, including the Project site, there is potential to impact archaeological resources during grading and construction activities within previously undisturbed soils.

If any archaeological artifacts are inadvertently discovered during ground-disturbing activities, existing federal, State, and local laws and regulations as well as the Mitigation Measure CUL-1, will require construction activities to cease until such historical artifacts are properly examined and determined not to be of significance by a qualified cultural resource professional.

In conclusion, with mitigation measures incorporated, the Project will not result in any significant impacts related to historical or archaeological resources. Project impacts are considered **less than significant with mitigation incorporated**.

c) Disturb any human remains, including those interred outside of formal cemeteries?

Disturbance of human remains interred outside of formal cemeteries would result in a significant impact. If human remains are identified during Project construction, Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code shall apply, as appropriate. Although there is no record of isolated human remains or unknown cemeteries on the Project site, there is always a possibility that ground-disturbing activities associated with future development may uncover previously unknown buried human remains.

If human remains or a cemetery are inadvertently discovered during ground-disturbing activities, existing federal, State, and local laws and regulations, as well as Mitigation Measure CUL-2, will require construction activities to cease within 50 feet until such resources are properly examined by a qualified archeological monitor and the coroner of Fresno County shall be contacted as stated in Health and Safety Code Section 7050.5. Subsequent actions will be determined based on the results of the examination.

In conclusion, with mitigation measures incorporated, the Project will not result in any significant impacts related to historical or archaeological resources. The Project impacts are considered **less than significant with mitigation incorporated**.

Mitigation Measures

The proposed project shall implement and incorporate, as applicable, the cultural resources related mitigation measures identified.

Mitigation Measure CUL-1: If cultural resources (i.e., prehistoric sites, historic sites, and isolated artifacts and features) are discovered during the course of construction within the Project Area, work shall be halted immediately within 50 meters (165 feet) of the discovery, the City of Fresno shall be notified, and a qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to determine the significance of the discovery.

The City of Fresno shall consider mitigation recommendations presented by the qualified archaeologist for any unanticipated discoveries and the project proponent shall carry out the measures deemed feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. The project proponent shall be required to implement any mitigation necessary for the protection of cultural resources.

Mitigation Measure CUL-2: If human remains are found during ground disturbance activities associated with implementation of the Project, there shall be no further excavation or disturbance within 50 feet of the discovery and a qualified archaeological monitor and the coroner of Fresno County shall be contacted as stated in Health and Safety Code Section 7050.5. If it is determined that the remains are Native American, the coroner shall contact the Native American Heritage Commission within 24 hours.

The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descendent (MLD) from the deceased Native American. The MLD may then make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and associated grave goods as provided in Public Resources Code section 5097.98. The landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further disturbance if:

a) the Native American Heritage Commission is unable to identify a MLD or the MLD failed to make a recommendation within 24 hours after being notified by the commission;
b) the descendent identified fails to make a recommendation; or
c) the landowner or his authorized representative rejects the recommendation of the descendent, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. ENERGY – Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?		X		
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

The analysis in this section is substantiated by an Air Quality Impact Analysis (QK, 2025b), an Air Quality and Greenhouse Gas Analysis Report (Mitchell Air Quality Consulting, 2020) and a Traffic Impact Study (Peters Engineering Group, 2020), prepared for the Project and is attached as Appendix B and Appendix F, respectively.

DISCUSSION

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

Construction Impacts

Energy usage would be required to construct the proposed residential subdivision and related improvements. Construction would be short-term and temporary in nature. Construction activities include standard construction processes such as grading, paving, trenching, architectural coating, and building construction.

There are no unusual Project characteristics or construction processes that would require the use of equipment that would be more energy-intensive than is used for comparable activities. The primary sources of energy for construction activities are diesel and gasoline (i.e., petroleum fuels). All construction equipment is required to conform to current emissions standards and related fuel efficiencies, including applicable CARB regulations and California Energy Code Standards. Current regulations for construction equipment, heavy-duty equipment, and earthmoving equipment used in construction contribute to reductions in energy as well as reductions in pollutant emissions.

California implemented its In-Use Off-Road Diesel Fueled Fleets regulations (off-road regulation) that apply to all self-propelled off-road diesel vehicles 25 horsepower or greater and most two-engine vehicles. The Small Off-Road Engines Program was implemented by California to apply to categories of outdoor powered equipment and specialty vehicles often used in construction.

An example of energy reduction standards would include, but not be limited to, CARB's Off-Road Diesel Regulations (California Air Resources Board (CARB), 2022):

1. Imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles;
2. Requires all vehicles to be reported to CARB, which can be done through the online reporting system Diesel Off-Road Online Reporting System (DOORS), and labeled;
3. Restricts the adding of older vehicles into fleets starting on January 1, 2014;
4. Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies, VDECS (i.e., exhaust retrofits);
5. Requires the phase-out of the oldest and dirtiest engines starting on January 1, 2024;
6. Requires the procurement and use of renewable diesel (R99 or R100) starting January 1, 2024, with limited exceptions; and
7. Requires contracting entities to obtain valid Certificates of Reported Compliance for all listed contractors and subcontractors for contract work where vehicles subject to the Off-Road Regulation will operate.

Operational Impacts

The Project will not utilize natural gas appliances or plumbing and will utilize all electric appliances. The Project's residential units will be equipped with rooftop solar panels pursuant to Title 24, Part 6, Section 150.1(c)14 of the 2025 Building Energy Efficiency Standards for Residential and Nonresidential Buildings. Residential units will also be EV-ready (pre-wired during construction to allow for the future installation of an EV residential charger).

The panels will generate sufficient electricity to meet the needs of each home and/or offset energy demand on the existing utility grid system, pursuant to Title 24, Part 6, Section 150.1(c)14:

"All single-family residential buildings shall have a newly installed photovoltaic (PV) system or newly installed PV modules meeting the minimum qualification requirements specified in Joint Appendix JA11. The annual electrical output of the PV system shall be no less than the smaller of a PV system size determined using Equation 150.1-C, or the total solar access roof area (SARA) multiplied by 18 for steep-sloped roofs or multiplied by 14 for low-sloped roofs."

Prior to the issuance of building permits for new development projects within the Plan Area, the Project proponent will show on the building plans that all major appliances (dishwashers, refrigerators, clothes washers, and dryers) to be provided/installed are Energy Star-certified appliances or appliances of equivalent energy efficiency. Installation of Energy Star-certified or equivalent appliances shall be verified by the City of Fresno Planning and Development Department prior to the issuance of a certificate of occupancy as required by Mitigation Measure ENG-1.

Development of the proposed residential development and associated improvements would be required to meet the California Code of Regulations Title 20, Energy Building Regulations, and Title 24, Energy Conservation Standards, for energy efficiency that are in effect at the time of construction. California Code of Regulations, Title 24, Part 11 (CALGreen) also sets minimum mandatory energy efficiency and materials requirements, in order to reduce environmental impact through better planning, design, and construction practices enforced at the City level when obtaining building permits.

Regarding energy consumed through vehicle trips, the newly constructed residential units would be required to comply with the current CALGreen standards, which require EV-capable or EV-ready outlet provisions. As a result, compliance with CALGreen would decrease vehicle fuel energy consumption associated with the Project.

The latest Building Energy Efficiency Standards under Parts 6 and 11 of Title 24 of the California Code of Regulations would require improvements for attics, walls, water heating, and lighting, as compared with the previous version of these standards. Other statewide measures, including those intended to improve the energy efficiency of the statewide passenger and heavy-duty truck vehicle fleet (e.g., the Pavley Bill and the Low Carbon Fuel Standard), would improve vehicle fuel economies, thereby conserving gasoline and diesel fuel usage associated with the Project. These energy savings would continue to accrue over time. The proposed Project would comply with all existing energy standards, including those established by the City, the Air District (i.e., SJVAPCD), and the State of California, and would be expected to not result in significant adverse impacts on energy resources.

Based on the information presented above, the Project would not consume energy in a manner that is wasteful, inefficient, or unnecessary, nor would it conflict with any State or local plan for energy efficiency. Thus, **impacts would be less than significant with mitigation incorporated.**

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

As discussed under Impact a) above, the Project would be subject to compliance with Title 24 Building Code requirements, such as energy-efficient building materials and appliances. Compliance with these applicable policies would support a decrease in energy consumption and GHG emissions, enabling the Project to contribute to sustainable community goals and the goals of AB 32. The Project would not conflict

with any of the applicable plans, including Title 24, AB 32, Senate Bill (SB) 32, SB 350, and SB 100. Therefore, the Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency and impacts would be **less than significant**.

Mitigation Measures

The proposed project shall implement and incorporate, as applicable, the energy related mitigation measure identified.

Mitigation Measure ENG-1: Prior to the issuance of building permits the project applicant shall show on the building plans that all major appliances (dishwashers, refrigerators, clothes washers, and dryers) to be provided/installed are Energy Star-certified appliances or appliances of equivalent energy efficiency. Installation of Energy Star-certified or equivalent appliances shall be verified by the City of Fresno Planning and Development Department prior to the issuance of a certificate of occupancy.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS – Would the Project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X	
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?			X	
b) Result in substantial soil erosion or the loss of topsoil?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			X	

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

DISCUSSION

The analysis in this section is substantiated, in part, by the Geotechnical Engineering Investigation Report prepared for the Project attached as Appendix E (Krazan & Associates, Inc. , 2019).

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Fault ruptures are generally expected to occur along active fault traces that have exhibited signs of recent geological movement (i.e., in the last 11,000 years). Alquist-Priolo Earthquake Fault Zones delineate areas around active faults with potential surface fault rupture hazards that would require specific geological investigations prior to approval of certain kinds of development within the delineated area. The Project site is not located within an Alquist-Priolo Earthquake Fault Zone. In addition, no known active or potentially active faults or fault traces are located in the Project vicinity. The nearest active fault is the San Andreas Fault, located approximately 60 to 70 miles west of the Project site (Krazan & Associates, Inc. , 2019). As a result, potential impacts related to fault ruptures would be **less than significant** and no mitigation is required.

ii. Strong seismic ground shaking?

The Fresno Region is located in an area with historically low to moderate level of seismicity (City of Fresno Planning and Development Department, 2025a). Although, seismic ground shaking in the Plan Area is expected over the lifetime of

the WANSP implementation. According to the WANSP, the potential for ground shaking caused by seismic activity can occur anywhere in California, including the Plan Area.

Further, compliance with the California Building Code (Title 24, California Code of Regulations), as determined to be applicable by the City's Building Official or similar representative during the building permit phase of Project review, would ensure that the applicable geotechnical designs of the proposed Project, including but not limited to, meeting specifications for steel joists, joist chord bracing, truss design drawings, etc., would reduce potential impacts related to seismic ground shaking to less than significant,.

In conclusion, the Project impacts are considered **less than significant**.

iii. Seismic-related ground failure, including liquefaction?

Liquification potential in the city of Fresno is considered low to moderate. No liquefication has been observed in Fresno from any historic earthquake and liquefaction zones have not been identified in Fresno County by the State.

According to WANSP, the potential for liquefaction is highest when groundwater levels are high, and loose, fine sand soils occur at depths of less than 50 feet (City of Fresno Planning and Development Department, 2025a). Since groundwater occurs below 60 feet, liquefication potential was determined to be low on the Project site (Krazan & Associates, Inc. , 2019). In conclusion, significant impacts related to liquefication and the Project impacts are considered **less than significant.**

iv. Landslides?

A landslide generally occurs on relatively steep slopes and/or on slopes underlain by weak materials. The City is located within an area that consists of mostly flat topography within the Central Valley. Accordingly, landslide zones have not been identified in Fresno County by the State (City of Fresno Planning and Development Department, 2025a). However, there is the potential for landslides and slumping along the steep banks of rivers, creeks, or drainage basins such as the San Joaquin River bluff and the many unlined basins and canals that trend throughout the City. The Project site is located in a relatively flat area, and it is not in the vicinity of the San Joaquin River bluff or any unlined basin or canal. In conclusion, the Project will not result in any significant impacts related to landslides during construction or operation and the Project impacts are considered **less than significant**.

b) Result in substantial soil erosion or the loss of topsoil?

Grading and earthmoving during Project construction has the potential to result in

erosion and loss of topsoil. Exposed soils could be mixed in stormwater runoff and transported off the Project site.

In order to minimize potential soil loss during construction, the Project proponent is required to submit a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) to the Regional Water Quality Control Board (RWQCB) to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ). The SWPPP will use Best Management Practices (BMPs) to reduce erosion and control sediment runoff.

Once constructed and operational, the Project is unlikely to have large areas of exposed topsoil. The majority of the site would be completely developed with residences and associated infrastructure such as driveways, landscaping and roadways. Impacts related to soil erosion during long term operations would be less than significant.

In conclusion, the Project will not result in any significant impacts related to soil erosion or sedimentation during construction or operation and the Project impacts are considered **less than significant.**

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

As described in discussion a) in this section, soils on the Project site would not be subject to liquefaction, lateral spreading, or landslides. Additionally, the proposed Project would be required to conform with the California Building Code to reduce risks related to unstable soils.

In conclusion, the Project will not result in any additional impacts related to on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse during construction or operation , and the Project impacts are considered **less than significant.**

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?

Expansive soils can undergo significant volume change with changes in moisture content (City of Fresno Planning and Development Department, 2025a). They shrink and harden when dried and expand and soften when wet. Soils underlying the Fresno region consist partly of clays that are considered slightly to moderately expansive. The Plan Area is not mapped as having moderate to high expansion potential.

According to the Geotechnical Investigation performed for this Project, the Project site

has conducive soil for the development of this Project, provided that surface soil fill is compacted to an engineered standard and seismic design of the structures are based on the recommended parameters to implement compliance with CBC, including Table 181-B (Krazan & Associates, Inc. , 2019). Furthermore, the Project will comply with CBC, Title 14, Chapter 16 through 18, which addresses structural design, tests and inspections, and soils and foundation standards. In conclusion, the Project will not result in any significant impacts related to expansive soils , and the Project impacts are considered **less than significant**.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

The Project would be served by a wastewater conveyance system maintained by the City's Wastewater Management Division (WMD). Development of the proposed Project would not involve the use of septic tanks or alternative wastewater disposal systems. Therefore, the proposed Project would have **no impact** related to soils as it pertains to the use of septic tanks or alternative wastewater disposal systems.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Although no paleontological resources have been recorded within the Plan Area, unknown resources may be present (City of Fresno Planning and Development Department, 2025a). It is possible that undiscovered paleontological resources could be encountered during ground-disturbing activities. Damage to or destruction of a paleontological resource would be considered a potentially significant impact under local, State, or federal criteria.

The Project would ensure steps would be taken to reduce impacts to paleontological resources in the event that they are discovered during construction in compliance with Mitigation Measure GEO-1. In conclusion, with Mitigation Measure GEO-1 incorporated, the Project will not result in the destruction of a unique paleontological resource or unique geologic feature, and impacts are considered **less than significant with mitigation incorporated.**

Mitigation Measures

The proposed project shall implement and incorporate the Geology and Soils related mitigation measures as identified.

Mitigation Measure GEO-1: If any paleontological resources are found during grading and construction activities, all work shall be halted immediately within a 200-foot radius of the discovery until a qualified paleontologist has evaluated the find. Work shall not continue at the discovery site until the paleontologist evaluates the find and makes a determination regarding the significance of the resource and identifies recommendations for conservation of the resource, including preserving in place or relocating within the Plan Area, if feasible, or collecting the resource to the extent feasible and documenting the find

with the University of California Museum of Paleontology.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS – Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

The analysis in this section is substantiated by an Air Quality Impact Analysis (QK, 2025b), an Air Quality and Greenhouse Gas Analysis Report (Mitchell Air Quality Consulting, 2020) and a Traffic Impact Study (Peters Engineering Group, 2020) and Vehicle Miles Traveled (VMT) Analysis (VRPA Technologies, Inc., 2021), prepared for the Project and is attached as Appendix B and Appendix F, respectively.

DISCUSSION

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

Pursuant to CEQA Guidelines Section 15064.4, "A lead agency shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to (1) [q]uantify greenhouse gas emissions resulting from a project; and/or (2) [r]ely on a qualitative analysis or performance based standards."

The City does not currently have a GHG Reduction Plan but utilizes the BAAQMD's *CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plan*. The *CEQA Thresholds* document indicates that a land use project will contribute its "fair share" of what will be required to achieve the State's long-term climate goals, and can be presumed to have a less than significant impact related to operational GHG emissions, if it includes all the following project design elements:

- Buildings

- The project will not include natural gas appliances or natural gas plumbing.
- The project will not result in any wasteful, inefficient, or unnecessary energy use as determined by the analysis under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.

- Transportation

  - The project will achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target that reflects the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA.
    - Residential Projects: 15 percent below the existing VMT per capita
    - Office Projects: 15 percent below the existing VMT per employee
    - Retail Project: no net increase in existing VMT
  - The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

Natural Gas. The development of the Project will not include natural gas appliances or natural gas plumbing per Project design.

Energy Usage. Please see the discussion above in Section VI. Energy. The proposed Project will use energy-efficient materials, modern construction practices, and new Energy-Star appliances, following Appliance Efficiency Regulations [Title 20, California Code of Regulations (CCR) Sections 1601-1608]. Energy Consumption during construction and operation will align with typical residential construction and usage but will vary based on personal choices and building design. As previously discussed in VI. ENERGY, all construction equipment is required to conform to current emissions standards and related fuel efficiencies, including applicable CARB regulations and California Energy Code Standards. Current regulations for construction equipment, heavy-duty equipment, and earthmoving equipment used in construction contribute to reductions in energy as well as reductions in greenhouse gas emissions.

City of Fresno CEQA Guidelines for Vehicle Miles Traveled Thresholds

The Fresno City Council adopted the *CEQA Guidelines for Vehicle Miles Traveled (VMT) Thresholds* on June 25, 2020, which establishes the City's threshold of significance for CEQA transportation studies as it relates to VMT. In addition, Fresno COG's Fresno County SB 743 Implementation Technical Report (July 2025) also establishes thresholds of significance for CEQA transportation studies

as it relates to VMT. Both documents indicate that projects that are located in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility, will tend to exhibit similarly low VMT. The VMT threshold target in the City is 13% of the average County VMT per capita as determined for the region by CARB.

Fresno COG has developed a VMT screening map as a first step for determining applicability for further VMT analysis. Pursuant to the City's VMT Thresholds document, "[t]he Fresno COG VMT Screening Tool can be used to determine whether a development project may be screened from a detailed VMT analysis." According to the VMT screening map, the Project's parcel meets the applicable threshold for screening because it is anticipated that Average VMT/capita is 13.65, making it 87% or less than the regional average, and therefore it can be screened out of further VMT analysis (See Figure 4, below).

CALGreen Tier 2. As outlined in Title 24, Part 11, Section 4.106.4 of the 2025 California Green Buildings Standards Code, all new one and two family dwelling units with attached private garages shall have an "EV READY" service panel or subpanel circuit directory for future EV charging purposes. As previously discussed, the proposed Project will construct all residential units to be "EV READY".

The Project is therefore considered a low generator of GHG because it meets with all required design elements from the BAAQMD. Based on the information outlined above, the Project is considered to have a **less than significant impact** for GHG emissions.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

See Impact (a), above.

California passed the California Global Warming Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. Under AB 32, CARB was required to adopt regulations by January 1, 2011, to achieve reductions in GHGs to meet the 1990 emission cap by 2020. On December 11, 2008, CARB adopted its initial Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 and through subsequently enacted regulations. CARB's 2022 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan.

SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt Sustainable Communities Strategies (SCS) or Alternative Planning Strategies (APS) that will prescribe land use allocation in that MPO's regional transportation plan. CARB, in consultation with MPOs, has provided each affected region with

reduction targets for GHGs emitted by passenger cars and light trucks in the region by the years 2020 and 2035. For the Fresno COG region, CARB set targets at a six percent per capita decrease by 2020 and a 13 percent per capita decrease by 2035 from the base year of 2005. Fresno COG's 2022 Regional Transportation Plan (RTP)/SCS, which was adopted in July 2022, projects that the Fresno County region would achieve the prescribed emissions targets.

Executive Order B-30-15 establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. Executive Order B-30-15 requires MPOs to implement measures that will achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reduction targets.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designates locations for land uses to regulate growth. Fresno COG uses the growth projections and land use information in adopted General Plans to estimate future average daily trips and then VMT, which are then provided to SJVAPCD to estimate future emissions in the AQPs.

The Project is consistent with the currently adopted West Area Neighborhoods Specific Plan, which is consistent with the General Plan for the City of Fresno and the adopted Fresno COG 2022 RTP/SCS and is therefore consistent with the population growth and VMT applied in those plan documents. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP

Additionally, as proposed, each residential unit in the proposed subdivision would have photovoltaic solar panels installed on the rooftop. This would help offset the energy source emissions generated by off-site utility providers using fossil-fuel-driven facilities to generate power.

Based on the assessment above, the Project will not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Therefore, any impacts would be **less than significant**.

Mitigation Measures

No mitigation is required

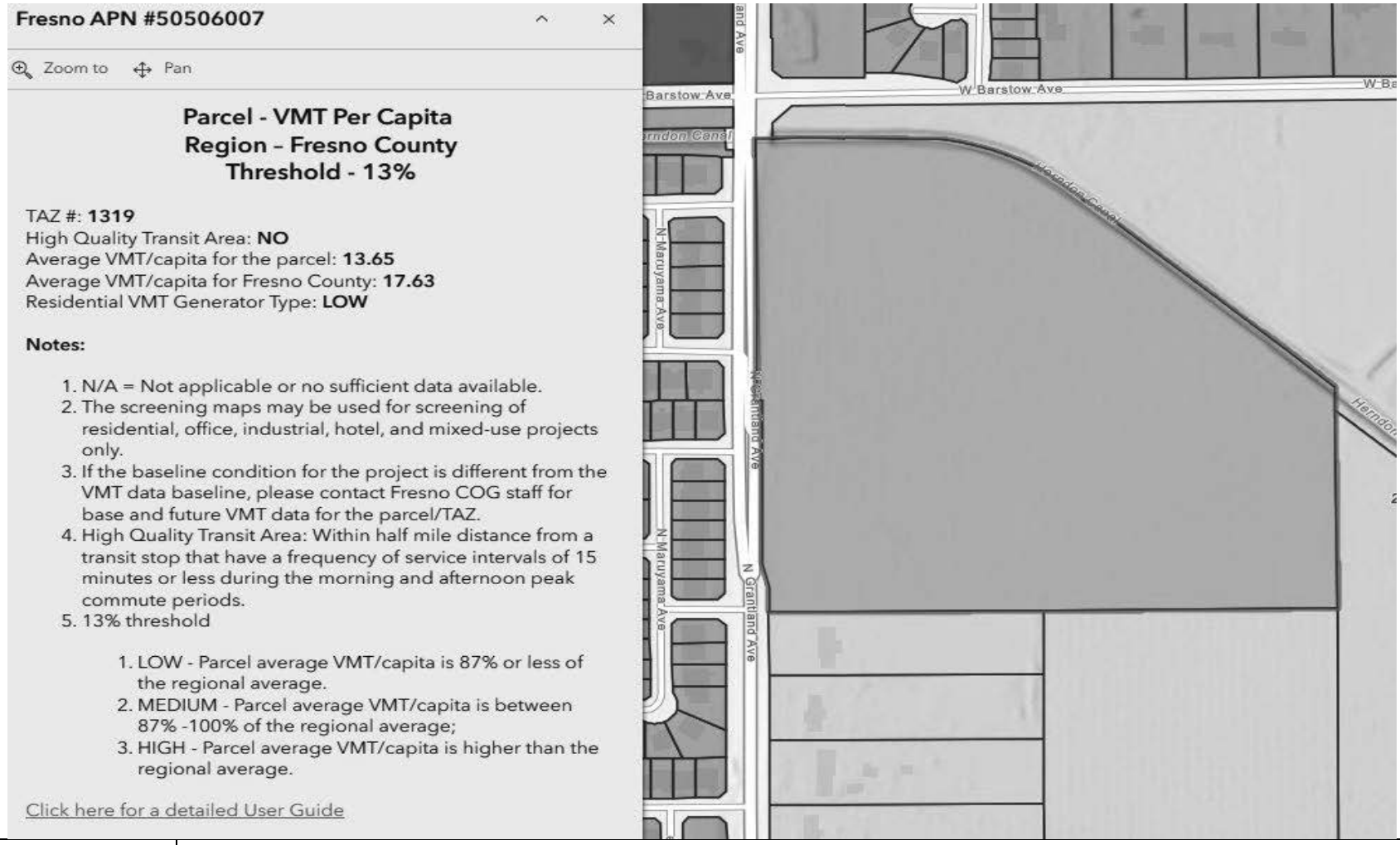


Figure 4
Vehicle Miles Traveled Screening Tool

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ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIAL – Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?				X

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			X	

The analysis in this section is based in part on the Phase I Environmental Site Assessment (Krazan & Associates, INC., 2019) completed for the Project and found in Appendix G.

DISCUSSION

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

The General Plan has a number of policies and procedures that safeguard public safety from the use, transport, treatment, and disposal of hazardous materials and hazardous wastes. These include Policy NS-4-a: Processing and Storage Policy NS-4-b: Coordination with local, regional and State agencies, Policy NS-4-c: Soil and Groundwater Contamination Reports, and Policy NS-4-e: Compliance with County Program for the transport of hazardous materials conform to the standards and procedures.

Construction activities associated with the proposed Project would involve the use of limited amounts of potentially hazardous materials, including but not limited to, solvents, paints, fuels, oils, and transmission fluids. However, all materials used during construction would be contained, stored, and handled in compliance with applicable standards and regulations established by the Department of Toxic Substances Control (DTSC), the United States Environmental Protection Agency (USEPA), and the Occupational Safety and Health Administration (OSHA). No manufacturing, industrial, or other uses utilizing large amounts of hazardous materials would occur within the Project site.

Hazardous and non-hazardous wastes would likely be transported to and from the Project site during the future construction phase of the proposed Project. Construction would most likely involve the use of some standard hazardous materials, such as

diesel fuel, hydraulic oil, grease, solvents, adhesives, paints, and other petroleum-based products, although these materials are commonly used during construction activities and would not be disposed of on the Project site. Workers would be trained to properly identify and handle all hazardous materials, following OSHA/CALOSHA regulations. Training would involve the appropriate handling of hazardous materials, focusing on the Hazard Communication Standard (HazCom) with proper labeling, Safety Data Sheets (SDSs), and comprehensive employee training on chemical hazards, safe storage (separation of incompatibles), Personal Protective Equipment (PPE), and emergency procedures, all governed by Title 8 regulations for the safety of workers and the public.

Hazardous waste would be either recycled or disposed of at a permitted and licensed treatment and/or disposal facility. Any hazardous waste or debris that is generated during construction of future buildout as a result of the Project would be collected and transported away from the site and disposed of at an approved off-site landfill or other such facility. In addition, sanitary waste generated during construction would be managed through the use of portable toilets, which would be located at reasonably accessible on-site locations. Hazardous materials such as paint, bleach, water treatment chemicals, gasoline, oil, etc., may be used during construction. These materials would be required to be stored in appropriate storage locations and containers in the manner specified by the manufacturer and disposed of in accordance with local, federal, and State regulations.

The use of hazardous materials will be limited in quantities and duration, and if spilled, would be localized. The proposed Project would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials or substances. The transport use and storage of hazardous materials would be required to comply with all applicable State and federal regulations, such as requirements that spills would be cleaned immediately, and all wastes and spills control materials would be properly disposed of at approved disposal facilities.

It is noted that residential construction generally uses fewer hazardous chemicals – and in relatively smaller quantities and concentrations – compared to commercial or industrial uses. In addition, once any future development is completed, the chemicals used would be consistent with hazardous materials typically used in residential settings including, but not limited to, minor quantities of pesticides/ rodenticides, fertilizers, paints, detergents, and other cleaners.

Once constructed, the use of hazardous materials such as paint, bleach, etc., is considered common for residential developments, and it would be unlikely for such materials to be stored or used in quantities that would be considered a significant hazard.

The transport of hazardous materials and any potential remediation activities would be subject to existing federal, State, and local regulations.

The Project will not result in any significant impacts and are therefore considered **less than significant**

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

See also discussion (a) above. Hazardous materials such as paint, bleach, water treatment chemicals, gasoline, oil, etc., may be used during construction. Any hazardous waste or debris that is generated during construction of future buildout as a result of the Project would be collected and transported away from the site and disposed of at an approved off-site landfill or other such facility. In addition, sanitary waste generated during construction would be managed through the use of portable toilets, which would be located at reasonably accessible on-site locations. These materials would be required to be stored in appropriate storage locations and containers in the manner specified by the manufacturer and disposed of in accordance with local, federal, and State regulations. Hazardous waste would be either recycled or disposed of at a permitted and licensed treatment and/or disposal facility.

A Phase I ESA was completed for the Project to identify if a recognized environmental condition (REC), controlled recognized environmental conditions (CRECs), or historical RECs (HRECs) were present at site in connection with current and past land uses (Krazan & Associates, INC., 2019). The Phase I ESA included: a site reconnaissance of existing on-site conditions and observations of adjacent property uses, a review of user-provided documents, a review of historical aerial photographs, a review of pertinent building permit records, city directories, Sanborn fire insurance maps (SFIMs), interview(s) with person(s) knowledgeable of the previous and current ownership and uses of the subject site, a review of applicable regulatory agency records and, a review of local, State, and Federal regulatory agency lists compiled by Environmental Data Resources, Inc. (EDR). The results of research indicated that the subject site did not contain any REC, CREC, or HREC in connection with the subject site.

Furthermore, the Project site is not listed as a contaminated property on the Hazardous Waste and Substances Site List (Cortese) (Department of Toxic Substances Control, 2025) and is not listed as a site on GeoTracker, which contains documented sources of unauthorized or authorized discharge or waste to land or released of hazardous substances from underground storage tanks (State Water Resources Control Board, 2025). Review of State of California Department of Conservation, Geological Energy Management Division (CalGEM) Online Mapping System (DOMS) indicated that no plugged and abandoned or producing oil wells are located on or adjacent to the Project site (California Department of Conservation, 2025).

According to the Phase I ESA, historic pesticide utilization concerns are low for elevated concentrations of environmentally persistent pesticides/herbicides related to

agricultural cultivation to exist in the near-surface soils of common agricultural ground at concentrations which would require regulatory action on the Project site (Krazan & Associates, INC., 2019). The Project will follow standard dust control measures to minimize dust during construction activities and would reduce potential pesticide exposure to workers. Once constructed, there would be minimal to no exposed soil that might create dust or expose residents to pesticide contamination.

As noted in Section VII GEOLOGY AND SOILS, (b), the Project would be required to prepare and implement a SWPPP under the National Pollutant Discharge Elimination System (NPDES) permit during construction. The SWPPP identifies potential sources of pollution from the Project that may affect the quality of stormwater discharge and requires that BMPs be implemented to prevent contamination at the source. By implementing BMPs during construction activities, accidental spills of hazardous materials would be contained, and soil and groundwater contamination would be minimized or prevented.

Therefore, based on the analysis herein, and compliance with federal and State regulations, the Project would not result in significant hazards to the public or environment through the release of hazardous materials and the impacts are considered **less than significant**.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The closest school is Brighten Academy Preschool Grantland, a private pre-school located 0.15 miles or 770 feet north of the Project site. All other schools in the vicinity are located more than a quarter mile from the Project site. As previously stated, the site has no known RECs, HRECs or CRECs on site. Construction of the proposed Project would not result in the use or emission of substantial quantities of hazardous emissions or hazardous or acutely hazardous materials that would pose a human or environmental health risk. Materials would be handled, stored, and disposed of in accordance with applicable standards and regulations.

As noted above in Response (a), residential construction activities typically include minimal amounts of hazardous materials such as lubricants and diesel fuel during construction. All storage, handling, and disposal of hazardous materials during Project construction would comply with applicable local and state safety standards and regulations.

As noted in Section VII GEOLOGY AND SOILS, (b), the Project would be required to prepare and implement a SWPPP. By implementing BMPs during construction activities, accidental spills of hazardous materials would be contained, and soil and groundwater contamination would be minimized or prevented. Included in these BMPs are spill prevention and control measures for hazardous materials..

Exhaust from construction and related activities are expected to be minimal and not significant. Therefore, the proposed Project does not involve activities that would result in hazardous emissions or hazardous materials or acutely hazardous substances within one-quarter mile of an existing or proposed school. In conclusion, the Project will not result in any significant impacts related to the possible release of hazardous materials in close proximity to schools and impacts are considered **less than significant**.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

According to the DTSC EnviroStor database, the Project site is not located on a federal superfund site, State response site, voluntary cleanup site, school cleanup site, evaluation site, school investigation site, military evaluation site, tiered permit site, or corrective action site (Department of Toxic Substances Control, 2025). Additionally, the Project site is not included on the list of hazardous waste sites compiled pursuant to Government Code Section 65962.5. As a result, no hazards to the public or environment are anticipated, and there would be **no impact.**

e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?

The Project is not within an Airport Land Use Compatibility Plan and there are no identified public or private airports within two miles of the Project site (City of Fresno Planning and Development Department, 2025a). The nearest airports include the Sierra Sky Park Airport, located approximately 2.93 miles to the northeast, Fresno Chandler Executive Airport, located approximately 7.14 miles to the southwest, and the Fresno International Airport, located approximately 10.09 miles southeast of the Project site.

Due to the distance between the Project site and local airports, operations at these locations are not expected to pose a safety hazard for people in the Project site. Therefore, **no impact** would occur.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The General Plan includes policies that relate to emergencies and natural disasters that would affect this Project. These include Policies NS-6-a (County Multi-Jurisdiction Hazard Mitigation Plan Policy), NS-6-c (Emergency Operations Plan Policy), NS-6-d (Evacuation Planning Policy), and Policy NS-6-f (Emergency Vehicle Access and Policy).

The California Emergency Services Act requires cities to prepare and maintain an Emergency Plan for natural, manmade, or war-caused emergencies that result in conditions of disaster or in extreme peril to life. The City's full-time Emergency Preparedness Officer (EPO) is responsible for ensuring that Fresno's emergency response plans are up-to-date and implemented properly. The EPO also facilitates cooperation between City departments and other local, State and federal agencies that would be involved in emergency response operations. The City of Fresno Emergency Operations Center (EOC) serves as the coordination and communication between the City of Fresno and Fresno County Operational Area EOC. The proposed Project would not result in any alterations of existing roadways that would block the circulation of emergency response services or introduce elements that would conflict with the operations of the EOC.

The applicant would be required to have an approved alternative route plan with a tentative schedule of planned closures prior to the beginning of construction, if applicable, which would be reviewed by the City of Fresno Public Works Department, the Fresno Fire Department (FFD) and the Fresno Police Department (City of Fresno Planning and Development Department, 2025a). Two points of emergency vehicular access are required and will be developed per FFD policy #403.002. Furthermore, any new roadways would be reviewed and approved by those same safety agencies. Traffic calming elements will be reviewed and approved prior to the T-6294's Final Map, which can improve roadway safety.

Pursuant to General Plan Policy NS-6-a, the Project would not conflict with the goals and objectives of the Fresno County's Multi-Jurisdiction Hazard Mitigation Plan (FCMHMP), including Objective 1.3, which requires the improvement of transportation corridors to allow for better evacuation routes for the public and better access for emergency responders (City of Fresno Planning and Development Department, 2025a).

Therefore, the proposed Project would not interfere with emergency evacuation plans in the City, and this impact would be **less than significant** and no mitigation is required.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The Project site is not located in a mapped State Responsibility Area (SRA) designated as a Fire Hazard Severity Zone (Moderate, High or Very High) or is within the Local Responsibility Area (LRA) of the City of Fresno Fire Department. The closest location, designated as Moderate Fire Hazard Zone is located 3.40 miles northeast along portions of riparian areas along the San Joaquin River.

The Wildland Urban Interface (WUI) is the zone of transition between unoccupied land and human development. It is the line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (U.S.

Fire Administration , 2022)**.** The Project site is not located within the Wildland Urban Interface (WUI) (ESRI, Mark Gilbert, 2021).

Furthermore, the Project areas are generally flat and by implementing state and local fire code requirements, the Project would not exacerbate the risk of exposure of Project occupants to wildfire. Therefore, impacts would be **less than significant.**

Mitigation Measures
No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY – Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			X	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?			X	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:				
i) Result in a substantial erosion or siltation on- or off-site;			X	
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site:			X	
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			X	
iv) impede or redirect flood flows?			X	

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?			X	
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			X	

The analysis in this section is substantiated in part by Water Supply Assessment (WSA) (QK, 2025e), prepared for the Project and attached as Appendix H.

DISCUSSION

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

The State Water Resources Control Board and nine Regional Water Quality Control Boards regulate the water quality of surface water and groundwater bodies throughout California. The proposed Project is within the jurisdiction of the Central Valley RWQCB.

Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During Project construction, there would be an increased potential to expose soils to wind and water erosion, which could result in temporary minimal increases in sediment load in nearby water bodies, including Herndon Canal, located immediately to the north of the subject parcel. However, this impact would be reduced to a less than significant level through compliance with water quality control measures, which include preparation of a SWPPP. A SWPPP is designed primarily to protect stormwater quality and would incorporate BMPs to minimize erosion and soil loss.

Long-term operational impacts associated with the proposed Project would be less than significant because the Project will comply with the Fresno Metropolitan Flood Control District's (FMFCD) Storm Drainage and Flood Control Master Plan (SDFCMP), which manages FMFCD's stormwater drainage systems, and will participate in the State Water Resources Control Board's Phase 1 NPDES Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems (Phase 1 MS4), which requires the City to implement water quality and watershed protection measures for all development Projects. Furthermore, the Project would be required to

pay development fees, referred to as drainage fees, specifically associated with drainage to help with improvements and maintenance of the stormwater drainage system.

The Project will not result in any significant impacts related to degrading surface or groundwater quality and the Project impacts are considered **less than significant.**

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?

The Project site is located in the Kings Subbasin (DWR Subbasin 5-22.08) within the greater Tulare Lake Hydrologic Region (DWR Basin 5.22) and also within the larger San Joaquin Valley Groundwater Basin (QK, 2025e). The Region encompasses approximately 16,800 square miles.

Water supply and wastewater services for the proposed Project would be provided by the City through the Department of Public Utilities (DPU) Water and Wastewater Management Divisions. The City receives its water supply from both groundwater and surface water sources (QK, 2025e). The city participates in and is a member of the North Kings Groundwater Sustainability Agency (NKGSA). The NKGSA adopted a Groundwater Sustainability Plan (GSP) in December 2019. The City contracts with FID (Fresno Irrigation District) for Kings River water and with the USBR (United States Bureau of Reclamation) for CVP (Central Valley Project) water from the Friant-Kern Canal. Groundwater is extracted by 270 wells located within the City's sphere of influence. In addition to production wells, the City has three surface water treatment facilities.

Per the City of Fresno 2020 Urban Water Management Plan (UWMP) the City has an estimated service population of approximately 550,217 people (QK, 2025e). In 2020, approximately 121,993 acre-feet (39,752 million gallons) of water was delivered to an estimated 140,150 water service connections of which approximately 91% of the water use is for residential services. The remainder are for commercial and industrial uses.

The sufficiency of the Project's water supply is analyzed on two bases: the physical availability of the City to provide water in the amounts required for Project construction and operation; and the estimates (in the 2020 City of Fresno UWMP) of normal water years, single dry water year and multiple dry water years, water supply and demand-related water availability with respect to projected water demand during a 20-year projection.

A WSA was prepared for the Project (Appendix H), estimating the anticipated amount of water necessary for the proposed residential development, and determined if there is sufficient water supply available to service the Project based on available data provided in the 2020 UWMP (QK, 2025e). Table 14 presents the normal year supply and demand and differences (QK, 2025e). Table 15 represents the single dry year

supply and demand, and Table 16 indicates the five consecutive dry year supply and demand comparison.

Table 14
Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	60,000	60,000	60,000	60,000	60,000
Surface Water – FID	125,030	131,600	131,600	131,600	131,600
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**329,030**	**341,140**	**346,610**	**352,000**	**357,330**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable (Groundwater Recharge) Deman	62,700	65,400	68,100	70,800	73,500
Demand Totals	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
Difference	**129,826**	**128,384**	**124,300**	**120,124**	**115,883**

Source: Appendix H

Table 15: Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	0	0	0	0	0
Surface Water – FID	45,852	45,852	45,852	45,852	45,852
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**189,852**	**195,392**	**200,862**	**206,252**	**211,582**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable (Groundwater Recharge) Deman	27,588	28,776	29,964	31,152	32,340

	2025	2030	2035	2040	2045
Demand Totals	**164,092**	**176,132**	**184,174**	**192,228**	**200,287**
Difference	**25,760**	**19,260**	**16,688**	**14,024**	**11,295**

Source: Appendix H

Table 16
Multiple Dry Year Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
First Year	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	30,000	30,000	30,000	30,000	30,000
	Surface Water – FID	99,725	99,725	99,725	99,725	99,725
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	Supply Totals	**273,725**	**279,265**	**284,735**	**290,125**	**295,455**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable (Groundwater Recharge) Deman	62,700	65,400	68,100	70,800	73,500
	Demand Totals	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	Difference	**74,521**	**66,509**	**62,425**	**58,249**	**54,008**
Second Year	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	37,200	37,200	37,200	37,200	37,200
	Surface Water – FID	93,426	93,426	93,426	93,426	93,426
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	Supply Totals	**274,626**	**279,265**	**284,735**	**290,125**	**295,455**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable (Groundwater Recharge) Deman	62,700	65,400	68,100	70,800	73,500

		2025	2030	2035	2040	2045
	Demand Totals	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	Difference	**75,422**	**67,410**	**63,326**	**59,150**	**54,909**
Third Year	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	**0**	**0**	**0**	**0**	**0**
	Surface Water – FID	**73,568**	**73,568**	**73,568**	**73,568**	**73,568**
	Recycled Water	**5,910**	**5,910**	**5,910**	**5,910**	**5,910**
	Supply Totals	**217,568**	**223,108**	**228,578**	**233,968**	**239,298**
	Potable Demand	**136,504**	**147,356**	**154,210**	**161,076**	**167,947**
	Non-Potable (Groundwater Recharge) Deman	**53,763**	**46,281**	**43,526**	**40,677**	**37,761**
	Demand Totals	**190,267**	**193,637**	**197,736**	**201,753**	**205,708**
	Difference	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
Fourth Year	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	0	0	0	0	0
	Surface Water – FID	45,852	45,852	45,852	45,852	45,852
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	Supply Totals	**189,852**	**195,392**	**200,862**	**206,252**	**211,582**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable (Groundwater Recharge) Deman	26,047	18,564	15,810	12,960	10,045
	Demand Totals	**162,551**	**165,920**	**170,020**	**174,036**	**177,992**
	Difference	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
Fifth Year	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	45,000	45,000	45,000	45,000	45,000

		2025	2030	2035	2040	2045
	Surface Water – FID	125,840	125,840	125,840	125,840	125,840
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	Supply Totals	**314,840**	**320,380**	**325,850**	**331,240**	**336,570**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable (Groundwater Recharge) Deman	62,700	65,400	68,100	70,800	73,500
	Demand Totals	199,204	212,756	222,310	231,876	241,447
	Difference	**115,636**	**107,624**	**103,540**	**99,364**	**95,123**

Source: Appendix H

As shown in Tables 14 through 16, anticipated groundwater supplies are sufficient to meet all demands through the year 2045 even under multiple-dry year drought conditions.

The current water distribution system is adjacent to the Project site. The construction process is estimated to take approximately 2.5 years. Construction water demands are estimated to be approximately 225 gpd/acre for the duration of construction or 19.43 acre-feet total (7.77 acre-feet per year), which is equivalent to approximately 6,311,300 gallons total (2,524,520 gallons per year) (QK, 2025e).

Initial construction water usage will be in support of site preparation and grading activities. During earthwork for grading of access road foundations, building foundations and project components, the principal use of water would be for compaction and dust control. After the earthwork activities, water usage will be used for dust suppression and normal construction water requirements that are associated with construction of the buildings, internal access roads, and revegetation.

The long-term average daily operational water demand will be for the residential users and is anticipated to be approximately 47.3 million gallons per year or 145.16 acre-feet per year for the total build out of the Project. This is based on each residential unit having an average water demand of 693 gallons per day (based on the 198-gallon per capita/day average in the 2020 UWMP and 3.5 people per unit) across the entire buildout of 187 units for the Project. The Project water demand is included in the projected increase in water demand of 42,243 AF from 2025 to 2045. The Project long-term operational water demand is 0.043% (145.16 AF/336,570 AF) of the available water supply in the city.

Project construction would add additional impervious surfaces to the Project site; however, various areas of the Project site would remain largely pervious, which would allow infiltration to underlying groundwater. For example, the Project includes approximately 46,228 square feet dedicated to open space and landscaped areas combined that would largely remain pervious (Outlots A through E). The areas would continue to contribute to groundwater recharge following the construction of the Project.

Further, where feasible, the Project will adhere to the following WANSP policies that reduce impacts on groundwater recharge such as IPR 2.9**:** Plant locally appropriate, drought-tolerant landscaping and IPR 3.1 that encourage the incorporation of water conservation methods in new development, such as greywater systems, drought-resilient landscaping, and reduction of nonporous surfaces.

Planting and Irrigation of street trees shall conform to the minimum spacing, guidelines, and requirements as stated in the *Model Water Efficiency Landscape Ordinance and the City's Public Works Standards and Specifications, Section 25 and 26.*

The Project is not anticipated to significantly affect groundwater quality because sufficient stormwater infrastructure including FMFCD compliant stormwater drain pipelines would be constructed as part of the Project to detain and filter stormwater runoff and prevent long-term water quality degradation. Therefore, Project construction and operation would not substantially deplete or interfere with groundwater supply or quality.

The proposed Project would also be consistent with water management strategies from both the UWMP and the City's Metropolitan Water Resources Management Plan. Furthermore, the Project would be required to comply with water management requirements and recommendations of the City's DPU, which would reduce the Project impacts to groundwater recharge to less than significant. When development permits are issued, the Project site would be required to pay drainage fees pursuant to the Fresno Municipal Code (Chapter 12, Article 19).

The proposed Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Therefore, impacts are **less than significant**.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site?

The rate and amount of surface runoff is determined by multiple factors, including

the following: topography, the amount and intensity of precipitation, the amount of evaporation that occurs in the watershed and the amount of precipitation and water that infiltrates to the groundwater. The proposed Project would alter the existing drainage pattern of the site, which would have the potential to result in erosion, siltation, or flooding on or offsite, and a temporary retention basin will be located on the Project site. The disturbance of soils onsite during construction could cause erosion, resulting in temporary construction impacts. In addition, the placement of permanent structures onsite could affect drainage in the long-term. Impacts from construction and operation are discussed below.

Stormwater collection and disposal, and flood control for the City, City of Clovis, and the unincorporated areas within the City of Fresno's sphere of influence are provided by the FMFCD.

The Project site is generally flat and does not have a stream or river and is located directly south of the Herndon Canal, but is not near another body of water. The Project would not result in substantial erosion or siltation on or offsite or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or offsite.

As noted in Section VII GEOLOGY AND SOILS Impact (b), construction of the proposed Project would result in grading on the site that would expose native soils that could be subject to the effects associated with wind and water erosion unless adequate measures are taken to limit the transport of soils in surface water from the site to downstream locations. However, this exposure would be limited in time to the period required to construct the Project.

As required by the WANSP, a SWPPP would be developed prior to any ground disturbance at the Project site, and would include BMPs to reduce erosion and surface water contamination during construction of the proposed Project.

Project construction would add additional impervious surfaces to the Project site; however, various areas of the Project site would remain largely pervious, which would allow infiltration to underlying groundwater. For example, the Project includes approximately 46,228 square feet dedicated to open space and landscaped areas combined that would largely remain pervious (Outlots A through E) allowing for slow of waterflow during rain events, reducing siltation running off the Project site once operational. Furthermore, compliance with the City's grading plan check process, the FMFCD SDFCMP, and stipulations of the NPDES Construction General Permit would ensure that potential impacts related to erosion and siltation on- and off-site would be less than significant.

The Project will not result in any significant impacts related to substantial soil erosion or siltation on or offsite and the Project impacts are considered **less than significant**.

ii. Substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

Ground-disturbing activities related to Project construction, such as grading, excavation, placing fill, and trenching, could change existing surface drainage patterns and increase the potential for flooding, particularly during storm events. Regulatory mechanisms in place that would reduce the effects of construction activities on drainage patterns that would result in flooding on or off the construction site include compliance with the City of Fresno grading plan check process, the SDFCMP, and the NPDES Construction General Permit. Compliance with these required regulations would prevent Project construction impacts on grading patterns and flooding on and off of the construction site.

Development and operation of the Project would include landscaping and open space, which will allow stormwater to percolate back into the groundwater system in addition to the construction of FMFCD compliant storm drain lines that would direct stormwater into FMFCD's existing system to reduce the rate of surface runoff and avoid flooding on- or off-site. The Project will not result in any significant impacts related to surface water runoff and the Project impacts are considered **less than significant**.

iii. Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Please refer to discussions a) and c) i and ii in this section. The proposed Project would increase impervious surfaces at the Project site. However, with implementation of a SWPPP, the Project would be required to implement BMPs for controlling pollution sources during Project construction.

The proposed Project would not exceed capacity of stormwater drainage systems or generate additional sources of polluted runoff. The nearest FMFCD drainage basin is located 535 feet northwest of the Project site near the corner of North Grantland Avenue and West Barstow Avenue. As noted, the Project would develop suitable storm water drainage infrastructure to FMFCD standards.

Additionally, the Project Applicant would pay the City's drainage fee to address impacts related to increased amount of surface runoff resulting from the proposed Project. The Project will not result in any significant impacts related to stormwater drainage systems or polluted runoff and the Project impacts are considered to be **less than significant.**

iv. Impede or redirect flood flows?

Please see responses (c(i)-c(iii)), above. The rate and amount of surface runoff are determined by multiple factors, including the following: topography, the amount

and intensity of precipitation, the amount of evaporation that occurs in the watershed, and the amount of precipitation and water that infiltrates the groundwater. According to the Federal Emergency Management Agency (FEMA) the Project site is located on Flood Insurance Rate Map (FIRM) 06019C1535H and 06019C1545H in an Area of Minimal Flood Hazard (Federal Emergency Management Agency, 2009). Therefore, it is unlikely that construction and operation of the Project will impede or redirect flood flows. As a result, the impact would be **less than significant.**

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?

As discussed above in section c)iv., the Project site is not within a flood hazard zone, as designated by FEMA.

The Project site is not located near the ocean or a steep topographic feature (i.e., mountain, hill, bluff, etc.). Additionally, there is no body of water within the vicinity of the Project site. The Project site is not located near a large body of water or within an area of concern for seismic activity, as discussed in Section VII GEOLOGY AND SOILS(a)(i). The proposed Project's inland location makes the risk of tsunami highly unlikely, as the coast is approximately 104 miles to the west. Therefore, tsunami or seiche risks are relatively low.

The closest dams are the Friant Dam, approximately 17 miles northeast, and Hidden Dam, approximately 20 miles north of the Project. Therefore, the risk of release of pollutants due to Project inundation is low and the impact is **less than significant**.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

See Section X. HYDROLOGY AND WATER QUALITY subsection a) discussed above.

Per the City of Fresno 2020 UWMP, the City has an estimated service population of approximately 550,217 people, and an approximate delivery of 121,993 acre-feet (39,752 million gallons) of water to an estimated 140,150 water service connections, of which approximately 91 percent of the water use is for residential services (QK, 2025e). The remainder are for commercial and industrial uses. The City utilizes local groundwater and surface water as its source of water supply. Groundwater is extracted by 270 wells located within the City's sphere of influence, in addition to three surface water treatment facilities.

The Project is within City limits, and growth within the City limits is accounted for in the 2020 UWMP (QK, 2025e). As noted previously, the City would have an adequate water supply to meet all demands through the year 2045 even under the multiple dry year drought condition scenario. Based on the 2020 UWMP, the water supplies for the

City (357,330 AF/year) are adequate to accommodate the demand in the City by 2045 (i.e., 241,447 AF/year). The long-term average daily operational water demand will be for the residential users and is anticipated to be approximately 47.3 million gallons per year or 145.16 acre-feet per year for the total build out of the Project, which is 0.043% of the available water supply in the City.

Implementation of the City's General Plan and WANSP policies, the Kings Basin Integrated Regional Water Management Plan, City of Fresno Urban Water Management Plan, Fresno-Area Regional Groundwater Management Plan, and the City's Metropolitan Water Resource Management Plan will address the issues of providing an adequate, reliable, and sustainable water supply for the Project's urban domestic and public safety consumptive purposes. The City's DPU Water and Wastewater Management Divisions have reviewed the Project for compliance with water quality and groundwater management.

As noted above, the Project would be required to adhere to NPDES drainage control requirements during construction and operation, as well as to FMFCD drainage control requirements. Therefore, the Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan and the Project impacts are considered **less than significant.**

Mitigation Measures
No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING – Would the Project:				
a) Physically divide an established community?				X
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				X

DISCUSSION

a) Physically divide an established community?

The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility within an existing community, or between a community and outlying areas. For instance, the construction of an interstate highway through an existing community may constrain travel from one side of the community to another; similarly, such construction may also impair travel to areas outside of the community.

The proposed Project site is an open field surrounded by both urbanized single-Unit subdivisions, rural residential homes and other undeveloped lands. The Project site is within an area planned for Medium Density Residential development under the West Area Neighborhoods Specific Plan. Implementation of the Specific Plan would enhance the connectivity through improved roadways, pedestrian and bike paths, and develops a cohesive network of planned land uses compared to the previous patchwork of uneven development and lack of planned infrastructure and commercial amenities (City of Fresno Planning and Development Department, 2025b; City of Fresno Planning and Development Department, 2025a). Therefore, there are **no impacts.**

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Existing land use plans, policies, and regulations that govern land uses within the Plan Area include the City of Fresno General Plan and Development Code. The Specific Plan established the land use planning and regulatory guidance, including the land use and zoning designations and policies, for the approximately 7,077-acre Specific Plan Area (City of Fresno Planning and Development Department, 2025a). The proposed single-Unit residential development is allowed within the Medium Density Residential land use designation planned for the site, and the Project does not exceed the maximum density. The Project will not conflict with any General or Specific Plan goals or policies.

Therefore, the proposed Project would not result in any significant environmental impacts due to a conflict with any land use plan, policy or regulation adopted for the purpose of avoiding or mitigation environmental impacts and there would be **no impact.**

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. MINERAL RESOURCES – Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

DISCUSSION

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The California Department of Conservation, Geological Survey classifies lands into Aggregate and Mineral Resource Zones (MRZs) based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act of 1974. These MRZs identify whether known or inferred significant mineral resources are present in areas and are classified as:

MRZ-1 Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

MRZ-2 Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

MRZ-3 Areas containing mineral deposits, the significance of which cannot be evaluated.

MRZ-4 Areas where available information is inadequate for assignment to any other MRZ classification.

(City of Fresno Planning and Development Department, 2025c)

Aggregate and petroleum are the county's most significant and valuable extractive resources. The principal area for mineral resources in the City is located along the San Joaquin River Corridor. The Specific Plan boundaries are not within the San

Joaquin River Corridor. Therefore, since the Project site is within the Specific Plan boundaries, the Project site is also not within the San Joaquin River Corridor and would not be within an MRZ.

According to CalGEM, there are no active, inactive, or capped oil wells located within the Project site or within a mile radius of the site, and it is not within a recognized oilfield (California Department of Conservation, 2025). Therefore, there is **no impact** on known mineral resources that would be of value to the region and the residents of the state.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

Please refer to the discussion for a). The proposed Project would not result in the loss of availability of any known locally important mineral resource recovery sites. Therefore, the Project would result in **no impact**.

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. NOISE – Would the Project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?				X

The analysis presented in this section is based on an Acoustical Analysis (WJV Acoustics, Inc., 2020), prepared for the Project and attached as Appendix I.

DISCUSSION

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?

The City of Fresno General Plan Noise Element provides noise level criteria for land use compatibility for both transportation and non-transportation noise sources. The General Plan sets noise compatibility standards for transportation noise sources in terms of the Average Level (Ldn) for Outdoor Activity Areas and Interior Spaces. The Ldn represents the time-weighted energy average noise level for a 24-hour day, with a 10-dB reduction for noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The Ldn represents cumulative exposure to noise over an extended period

of time and are therefore calculated based upon annual average conditions. Table 16 provides the General Plan Noise Element noise level standards for transportation noise sources.

TABLE 16

CITY OF FRESNO GENERAL PLAN NOISE LEVEL STANDARDS TRANSPORTATION (NON-AIRCRAFT) NOISE SOURCES

Noise-Sensitive Land Use[1]	Outdoor Activity Areas[2]	Interior Spaces	
	L_{dn}/CNEL, dB	L_{dn}/CNEL, dB	L_{eq} dB[2]
Residential	65	45	---
Transient Lodging	65	45	---
Hospitals, Nursing Homes	65	45	---
Theaters, Auditoriums, Music Halls	---	---	35
Churches, Meeting Halls	65	---	45
Office Buildings	---	---	45
Schools, Libraries, Museums	---	---	45

1 Where the location of the outdoor activity areas is unknown or is not applicable, the exterior noise level standard shall be applied to the property line of the receiving land use.

2 As determined for a typical worst-case hour during periods of use.

Source: City of Fresno General Plan

Additionally, implementing Policy NS-1-h of the Noise Element requires that interior noise levels not exceed 45 dB L_{dn} by requiring any newly proposed residential and noise sensitive uses comply with State Code requirements to incorporate noise reduction measures. The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

Construction

Project construction would result in short-term noise impacts on nearby sensitive receptors. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase (e.g., demolition, land clearing, grading, excavation, erection) of construction. Noise produced by construction equipment such as earthmovers, material handlers, and portable generators can reach high levels. Generally, the grading phase of construction involves the most equipment and generates the highest noise levels, although noise ranges are usually similar across all construction phases.

Chapter 10, Article 1 (Noise Regulations), of the Fresno Municipal Code establishes

excessive noise guidelines and exemptions. Section 10-109 states that construction noise is exempted from City noise regulations provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday.

Thus, although development activities associated with the proposed Project could potentially result in a temporary or periodic increase in ambient noise levels in the Project vicinity, construction activity would be exempt from City of Fresno noise regulations, as long as such activity is conducted pursuant to an applicable construction permit and occurs between 7:00 a.m. and 10:00 p.m., excluding Sunday. Therefore, short-term construction impacts associated with the generation of noise levels in excess of standards established in the General Plan or noise ordinance or applicable standards of other agencies would be less than significant.

Operational (post-construction)

Implementation of the proposed Project would result in new daily trips on local roadways in the Project site vicinity. Once construction has been completed, noise generated by the proposed Project would mostly be generated by vehicular traffic. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the sound receptor.

The Project site is located southeast of North Grantland Avenue and north of West Barstow Avenue, and would be exposed traffic noise. The distance from the center of the closest proposed lots' backyards from the centerline of North Grantland Avenue is approximately 75 feet. The distance from the center of the closest proposed lots' backyards from the centerline of West Barstow Avenue is approximately 120 feet. Noise exposure from traffic on North Grantland Avenue and West Barstow Avenue was calculated for existing and future (2035) conditions using the Federal Highway Administration (FHWA) Traffic Noise Model and traffic data obtained from Fresno COG (WJV Acoustics, Inc., 2020).

Exterior Noise Levels

The calculated noise exposures for existing and future (2035) traffic conditions for the closest proposed setbacks to North Grantland Avenue were approximately 62 dB Ldn and 59 dB Ldn, respectively. The calculated noise exposures for existing and future (2035) traffic conditions for the closest proposed setbacks to West Barstow Avenue were approximately 53 dB Ldn and 57 dB Ldn, respectively.

The decrease in traffic volume along North Grantland Avenue for future (2035) conditions is the result of the future extension of Veterans Boulevard, in the Project vicinity. The noise exposure levels do not exceed the City's 65 dB Ldn exterior noise level standard, and mitigation measures are therefore not required for compliance with the City's exterior noise level standard and impacts are l**ess than significant**.

The Project will be required to comply with all noise policies and development standards identified within the Fresno General Plan and WANSP, as well as the noise ordinance of the Fresno Municipal Code, Chapter 10 Article 1 – Noise Regulations.

The Project impacts are therefore considered **less than significant**.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Table 17 quantifies vibration source levels for commonly used construction equipment at 25 feet (City of Fresno Planning and Development Department, 2025c).

As shown in Table 17, there is a range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The nearest existing residences to the Project site located approximately 43 feet to the south.

Table 17
Reference and Projected Vibration Source Amplitudes for Construction Equipment

Type of Equipment	*PEAK PARTICLE VELOCITY @ 25 FEET (INCHES/SECOND)*	*APPROXIMATE VIBRATION LEVEL LV (VDB) @ 25 FEET*
Pile Drive (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 (upper range)	105
	0.170 (typical)	93
Clam shovel drop (slurry wall)	0.202	94
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drill	0.089	87
Loaded Truck	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58
Source: (City of Fresno Planning and Development Department, 2025a)		

It is anticipated that the following equipment would be used during construction activities:

- Roller
- Loaded trucks
- Excavator
- Generator
- Service truck
- Air compressor

Peak Particle Velocity (PPV) of 0.20 is the threshold at which there is a risk to "architectural" damage to normal dwellings (City of Fresno Planning and Development Department, 2025a). It is also the level at which ground-borne vibration are annoying to people in buildings. Impacts would be significant if construction activities result in ground-borne vibration of 0.20 inches per second PPV or higher at sensitive receptors. The proposed equipment for this Project will not require the use of equipment that is above the threshold. Therefore, on-site construction within the Project area is not expected to result in excessive groundborne vibration levels at nearby existing residential uses. Construction activities associated with the proposed Project are not expected to result in excessive groundborne vibration or groundborne noise levels.

Typical sources of vibration in a residential neighborhood could be heating, ventilation and air conditioning (HVAC) systems or residents using small power tools. Neither of which would generate groundborne vibrations in excess of the 0.20 PPV threshold discussed above. Therefore, no permanent noise sources would be located within the Project site that would expose persons to excessive groundborne vibration or noise levels.

The proposed Project is not expected to generate excessive groundborne vibration or noise and the impact would be **less than significant.**

c) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

As mentioned in Impact IX. HAZARDS AND HAZARDOUS MATERIALS e), the Project is not within an Airport Land Use Compatibility Plan or within two miles of a public airport and there are no documented public or private airports within two miles of the Plan Area (City of Fresno Planning and Development Department, 2025a). The nearest airports include the Sierra Sky Park Airport, located approximately 2.93 miles to the northeast, Fresno Chandler Executive Airport, located approximately 7.14 miles to the southwest, and the Fresno International Airport, located approximately 10.09 miles southeast of the Project site.

Due to the distance between the Project site and local airports, operations at these locations are not expected to expose people residing or working in the Project area to excessive noise levels. Therefore, **no impact** would occur.

Mitigation Measures
No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING – Would the Project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X	
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X

DISCUSSION

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Specific Plan Area has experienced a rapid population growth in the last 15 years and will allow for the orderly and planned development of up to 83,015 housing units at full buildout (City of Fresno Planning and Development Department, 2025c). The General Plan Housing Element estimates 3.0 persons per unit, which would mean the Specific Plan Area would accommodate approximately 249,045 total residents at full buildout (Fresno Council of Governments, 2024).

The Project proposes to construct 187 single-Unit residences, which would accommodate approximately 561 residents, based on the average persons per unit, or approximately 0.22 percent of the total residents and housing units planned for the Plan Area.

As discussed, the Specific Plan is expected to increase the population of the City through future development of mixed-use, commercial and residential development and will provide for the orderly and consistent development of the area that promotes enhanced transportation infrastructure, development of core commercial centers, creation of parkland and a diverse housing stock. The Project site is also designated as Medium Density Residential in both the Specific and General Plans as is zoned RS-5. Therefore, these Plans already contemplate the use of the Project site for residences.

Construction of the Project would likely be completed by construction workers residing in the City or the surrounding area; they would not require new housing.

As such, the Project would not induce substantial unplanned population growth in an area, either directly or indirectly. Impacts are considered to be **less than significant.**

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The site is currently undeveloped and without any residential structures, and is surrounded by a combination of undeveloped lots and residential properties. The proposed Project would not require the demolition of any housing, as the project site is currently undeveloped. Therefore, the proposed Project would not necessitate the displacement or removal of existing housing, and there are **no impacts.**

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. PUBLIC SERVICES – Would the Project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?			X	
Police protection?			X	
Schools?			X	
Parks?			X	
Other public facilities?			X	

DISCUSSION

a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

i. Fire protection?

The City of Fresno Fire Department (FFD) would provide fire protection services to the Project.

There are three fire stations that serve the Plan Area:

- Fire Station No. 14 is east of the Plan Area at 6239 North Polk Avenue, approximately 1.5 miles northeast of the Project site.
- Fire Station No. 16 is in the southern part of the Plan Area at 2510 North Polk Street, approximately 3 miles southeast of the Project site.

- Fire Station No. 18 is in the northern part of the Plan Area at 6605 West Shaw Avenue, approximately 0.30 miles southeast of the Project site.

Fire Station No. 18 was constructed in 2023 and helps maximize the department's "4 Minutes to Excellence" response time goal. FFD reviewed the proposed Project and determined that no new stations or personnel would be needed and determined that all lots are inside the fire 4-minute response time (Fresno Fire Department, 2026). There are no development restrictions related to fire department emergency services response. Additionally, the FFD reviews building permits and subdivision maps to ensure proper location and access to fire suppression equipment.

The timing of when new fire stations would be required or details about size and location cannot be known until such facilities are planned and proposed, and any attempt to analyze impacts to a potential future facility would be speculative. As new or expanded fire stations become necessary, construction or expansion projects would be subject to their own separate CEQA review in order to identify and mitigate any potential environmental impacts.

In addition, the Project developer would be required to pay development impact fees that will provide for future fire-related facilities as the City's population increases, as outlined in Chapter 12, Article 4.9 of the City's Municipal Code. This would ensure that any potential impacts to fire services and facilities would be **less than significant.**

ii. Police protection?

The City of Fresno Police Department (FPD) would provide police protection services to the Project. The Northwest District office is the closest police facility, located approximately 3.60 miles east of the Project site at 3074 West Shaw Avenue.

The Specific Plan notes that a future police station may be built within the Plan Area within the 21.78 acres of land designated for Public Facility uses (City of Fresno Planning and Development Department, 2025a).

However, the Fresno Police Department (FPD) reviewed the Project, and did not indicate in their comments that full buildout and operation of the Project would require hiring of new personnel or construction of new facilities.

In order to accommodate for the increased need for police protection services at the Project site, the developer would be required to pay development impact fees, including police facilities fees as outlined in Chapter 12, Article 4.8 of the City's Municipal Code.

The required payment of development impact fees, including police facilities fees,

would mitigate the small increase in overall population in the City. As such, Project impacts would be **less than significant**.

iii. Schools?

The Project site is located within the Central Unified School District (CUSD). Seven schools are located within the Plan Area, including four elementary schools, one middle school, and two high schools (City of Fresno Planning and Development Department, 2025a).

The Project site would be served by Teague Elementary School (Grades K-6), located 1.28 miles southeast of the Project site, Glacier Point Middle School (Grades 7-8) located 1 mile south of the Project site, and Justin Garza High School (9-12) located 0.93 miles south of the Project site. The current accumulated student generation rate for Central Unified School District is approximately 0.52 for Single-Family dwelling units. Based on the Single-unit rate of 0.52 at 187 homes, these developments will generate approximately 97 students (Central Unified School District, 2026). Specifically, this breakdown includes 62 students in the TK-6 grade level, 9 students in the 7-8 grade level, and 26 students in the 9-12 grade level. As noted previously, the full build out of the Project would be incremental, and therefore, will not generate a large number of new students at any one time.

According to CUSD's Facilities Master Plan (Central Unified School District (CUSD), 2021), the schools proposed to serve future students generated by this Project have the following facility utilization rates in the 2026/27 school year:

1) Teague Elementary School will be at 65.50 percent
2) Glacier Point Middle School will be at 77.10 percent
3) Justin Garza High School will be at 88.3 percent

CUSD has reviewed the proposed Project and determined that any impacts related to the need for new classrooms or personnel would be addressed by the payment of development impact fees by the Project applicant. It is not anticipated that the need for additional facilities would result in significant impacts.

Furthermore, according to Government Code Section 65996, the development fees authorized by Senate Bill 50 (1998) are deemed to be "full and complete school facilities mitigation" for impact caused by new development. Therefore, the payment of development fees would accommodate for the nominal increase in student population at the various schools utilized by future students residing in the subdivision of the Project site.

As noted, the Project will be serviced by existing school facilities in the vicinity of the site. Development impact fees administered by CUSD would offset impacts associated with the incremental increase of new students. Therefore, with implementation of standard local requirements for development Projects related to

school fees, the Project will not require new or physically altered school facilities to address the increase in the student population associated with the Project. Impacts are considered **less than significant.**

iv. Parks?

As discussed in Section XIV(a) - POPULATION AND HOUSING, the Project proposes to construct 187 single-Unit residences, which would generate approximately 561 residents in the Specific Plan Area.

The following parks are located within close proximity to the proposed Project site (City of Fresno Planning and Development Department, 2025c):

- Heritage Community Park - 0.25 miles east
- Inspiration Park - 1.12 miles southeast

There are six neighborhood parks and no regional parks within the Plan Area. According to the Specific Plan, the Project site is located in an area of the Plan Area that is in high priority for a future park (City of Fresno Planning and Development Department, 2025a).

This Project and all other future development within the Plan Area would be subject to the Park Facilities Fee outlined in Chapter 12, Article 4.7 of the City's Municipal Code (City of Fresno Planning and Development Department, 2025a). Impacts on parks and recreational facilities are determined by analyzing the projected increase in demand for these facilities as a result of future residential development and corresponding population increase projected under the proposed Project.

The Project proposes to dedicate Outlot A (17,759 square feet) for open space and recreation purposes and Outlot E (1,710 square feet) for pedestrian trails. The trail shall be constructed in accordance with the "Master Trails Manual" and the Public Works Department standards. The Project will also be required to pay park facility fees as outlined in Chapter 12, Article 4.7 of the City's Municipal. Therefore, with the inclusion of open space dedicated outlots and the payment of park impact fees, the Project would contribute its fair share in the development of new or expanded parks to help accommodate for the Project's residential development. Impacts to parks would be **less than significant.**

v. Other public facilities?

The Project build-out will result in the construction of 187 single-Unit residences. As discussed in section XIV. Population and Housing (a), the General Plan Housing Element estimates approximately 3.0 persons per dwelling unit. As such, the Project would house approximately 561 persons at full build out. As mentioned in the Specific Plan, the General Plan projects a population of 771,000 in the City by 2035. Therefore, the Project population would represent 0.073 percent increase in the 2035 population.

Future residences in the Plan Area may utilize other public facilities, such as libraries, community centers, and public healthcare facilities.

Library Services – The Project site would be serviced by the Fresno County Public Library system. The Teague Branch, located at the recently constructed Teague Community Resource Center, at 4718 North Polk Avenue is the only branch location located within the Plan Area. Nevertheless, the Biola, Fig Garden Regional, and Gillis branches are all within 5 miles of the Project site.

Community Centers – As mentioned, the Teague Community Resource Center is within the Plan Area and is located approximately 1.40 miles southeast of the Project site. This community center is a mixed use building that has lease spaces for the Fresno Library, Central Unified School District and Centro La Familia (Highway City Community Development, 2025).

Public Healthcare Facilities – There are two healthcare facilities in the Plan Area located on West Ashlan Avenue (Ashlan Medical Clinic and Valley Health Team).

As stated earlier, the Project's specific population growth would be responsible for 0.073 percent of the increase in the 2035 population.

Although development of the proposed Project could increase demand for other public services, including libraries, community centers, and public health care facilities, it would be nominal in nature.

The Project would be required to pay applicable development impact fees that would offset the increased utilization of public facilities. The proposed Project would not result in significant population growth that would increase the demand for these facilities, such that new facilities would be needed to maintain service standards, as these facilities are not currently overused and have capacity to serve new demand. Therefore, impacts from building or altering other public facilities would be **less than significant.**

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. RECREATION - Would the Project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?			X	

DISCUSSION

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

See discussion in XV. PUBLIC SERVICES iv. Parks.

As previously discussed in XV. Public Services iv. Parks, the Plan Area has six neighborhood parks and no regional parks. There are two parks located within close proximity to the proposed Project site (City of Fresno Planning and Development Department, 2025c):

- Heritage Community Park - 0.25 miles east
- Inspiration Park- 1.12 miles southeast

As discussed in Section XIV(a) - POPULATION AND HOUSING, the Project proposes to construct 187 single-unit residences, which would accommodate 561 residents or 0.22 percent of the total residents and housing units planned for the Plan Area.

Impacts on parks and recreational facilities are determined by analyzing the projected increase in demand for these facilities as a result of future residential development and corresponding population increase projected under the proposed Project.

In addition to the two outlots dedicated to open space and a recreational trail connection, the Project would also be required to pay development fees for Park Facilities outlined in Chapter 12, Article 4.7 of the City's Municipal Code to offset for the increased utilization caused by the Project's population increase. Therefore, impacts to parks would be **less than significant.**

b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

As discussed in XV. PUBLIC SERVICES iv. Parks and in the previous section, the Project proposes to develop two outlots that will be dedicated for open-space and future connectivity to walking trail. Outlot A, which is dedicated to open space, is approximately 17,759 square feet and the pedestrian trails are small connections that provide walking connectivity throughout the subdivision and walking access out of the Project site. According to the WANSP, if this outlot were to be developed as a park, it would be considered a pocket park (0.5-2 acres) (City of Fresno Planning and Development Department, 2025b). All outlots will be build to applicable City standards.

Considering the relatively small footprint of both the open space lot (Outlot A) and the pedestrian trail features, the Project's contain recreational facilities are unlikely to have an adverse physical effect on the environment. Therefore, impacts to parks would be **less than significant.**

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION – Would the Project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			X	
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?			X	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d) Result in inadequate emergency access?			X	

DISCUSSION

The analysis in this section is substantiated by an Air Quality Impact Analysis (QK, 2025b), an Air Quality and Greenhouse Gas Analysis Report (Mitchell Air Quality Consulting, 2020) and a Traffic Impact Study (Peters Engineering Group, 2020) and Vehicle Miles Traveled (VMT) Analysis (VRPA Technologies, Inc., 2021), prepared for the Project and is attached as Appendix B and Appendix F, respectively.

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Within proximity to the Project, there are several transportation facilities, including bicycle, pedestrian and transit facilities.

Bicycle Facilities

The City of Fresno *Active Transportation Plan* (ATP) refers to the Caltrans *Highway Design Manual* for classification of bicycle facilities as follows:
• Class I Bikeway (Bike Path): Off-street facilities that provide exclusive use for nonmotorized travel, including bicyclists and pedestrians.
• Class II Bikeway (Bike Lane): On-street facilities that use striping, stencils, and signage to denote preferential or exclusive use by bicyclists.

• Class III Bikeway (Bike Route): On-street pavement markings or signage that connect the bicycle roadway network along corridors that do not provide enough space for dedicated lanes on low-speed and low-volume streets.
• Class IV Bikeway (Separated Bikeways): Physically separated bicycle facilities that are distinct from the sidewalk and designed for exclusive use by bicyclists. Commonly known as “cycle tracks,” they are located within the street right-of-way, but provide similar comfort when compared to Class I Bikeways.

The ATP identifies a proposed bikeway system with Class II bike lanes on all of the major streets at the study intersections, with the following exceptions:
• Barstow Avenue east of Grantland Avenue;
• Shaw Avenue west of Grantland Avenue;
• Island Waterpark Drive (Polk Avenue) north of Shaw Avenue.

The ATP also identifies a Class I bike path along Veterans Boulevard and on the south side of Barstow Avenue near the Project site. The Project will construct a 12 foot wide Bike and Pedestrian Class I Trail, complete with lighting, signing, striping and landscaping, per the *Fresno General Plan*, the *Public Works Standard P-58 , P-60, P-61* and the *Caltrans Highway Design Manual*. The project will also construct an expressway barrier fence per *Public Works Standard P-74 and P-75*, when required per the *Highway Design Manual*. The Project is not expected to disrupt or impede existing or planned bicycle facilities (Peters Engineering Group, 2020).

Pedestrian Facilities

Pedestrian connectivity is not well established in the general vicinity of the site (City of Fresno, 2020). Sidewalks typically exist only within, and along the frontage of, adjacent residential developments. As noted previously, the Project will develop two outlots dedicated for open-space and a pedestrian trail. The trail shall be constructed in accordance with the “Master Trails Manual” and the Public Works Department standards. The Project would also be required to construct sidewalks along its frontage (per Public Works standard P-5). As a requirement of the Final Map of T-6294, all streets and pedestrian ways shall connect to other streets and pedestrian ways to form a continuous vehicular and pedestrian network with connections within the subdivision and to adjacent development. The Project is not expected to disrupt or impede existing or planned pedestrian facilities (Peters Engineering Group, 2020).

Transit Facilities

Fresno Area Express (FAX) provides bus service to the Fresno area. FAX Route 12 is the nearest to the Project site, with its nearest point being the intersection Shaw and Hayes Avenues, which is about a mile southeast of the Project site. The Project is to be constructed on an empty lot and is not expected to disrupt or impede existing transit facilities.

City Roadway Network

The roadway network in the City is a traditional grid-based network of north/south and east/west streets, except for portions of the downtown Planning Area, whose grid-based network of streets is angled consistent with the northwest/southeast railroad alignment. Almost all of the major streets in the Fresno metropolitan area are regularly spaced at one-half-mile intervals. The grid system provides high levels of accessibility (i.e., travel choices) for residents.

According to the Specific Plan, at the Project site, Grantland Avenue is a 1 lane roadway, Barstow Avenue and Shaw Avenue are both a 2 lane each side of left turn median or local street. The expansion of Veterans Boulevard in the Project area is classified as a super arterial. Traffic calming elements will be reviewed and approved prior to the T-6294's Final Map, which can improve roadway safety.

Traffic issues are typically viewed as localized impacts associated with the increase of vehicles traversing road intersections to the point at which a road intersection no longer functions as it was designed. This is commonly referred to as LOS. The TIS analyzed the impact the Project would have on the LOS of the aforementioned study roadway segments. The TIS analyzed traffic volumes under existing conditions, existing plus Project, near-term with project and cumulative year 2040 scenarios.

The proposed Project site and the study intersections are located in TIZ-III (Peters Engineering Group, 2020). For purposes of this study, a significant traffic impact will be identified if:

- the proposed Project will decrease the LOS below D at an intersection; or
- the proposed Project will exacerbate an existing deficiency at an intersection already operating below LOS D by increasing the average delay per vehicle at the intersection by 5.0 seconds or more.

The first step is to determine the trip generation to assess the impact that the development of the Project site may have on the surrounding roadway network in the City of Fresno. The trip generation was based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition (Peters Engineering Group, 2020). The vehicle trip generation estimates were based on ITE Land Use. The study locations were determined based on consultation with City of Fresno staff, County of Fresno staff, and Caltrans staff considering anticipated Project trip distribution, the size of the Project, and the existing conditions in the vicinity of the Project site. The correspondence is presented in Appendix A. This report includes analysis of the following intersections:

1. Grantland Avenue / Bullard Avenue
2. Grantland Avenue / Barstow Avenue
3. Grantland Avenue / North Site Access / San Ramon Avenue
4. Grantland Avenue / South Site Access / San Jose Avenue
5. Grantland Avenue / Shaw Avenue
6. Polk Avenue / Shaw Avenue

Data provided in the ITE *Trip Generation Manual, 10th Edition*, are typically used to estimate the number of trips anticipated to be generated by proposed projects. Table 18 presents the vehicle trip generation estimates for the Project (Peters Engineering Group, 2020).

Table 18
Project Trip Generation Estimate

Land Use	Units	Daily Trip		A.M. Peak Hour					Weekday PM Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Unit Detached Housing (210)	187	9.09		0.70	27:73	35	96	131	0.93	62:38	108	66	174

Source: (Peters Engineering Group, 2020)

Adjacent Site Trip Generation

The Project provides for connectivity to the site immediately east of the Project site. It is anticipated that the site to the east will be landlocked and will require access through the proposed Project. For purposes of the analyses, trips expected to be generated by an additional 16 residences east of the Project site are considered in the analyses. Table 19 presents trip generation estimates for the additional 16 residences to the east of the Project.

Table 19
Adjacent Site Trip Generation Estimate

Land Use	Units	Daily Trip		A.M. Peak Hour					Weekday PM Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Unit Detached Housing (210)	16	9.44	152	0.74	25:75	3	9	12	0.99	63:37	10	6	16

Source: (Peters Engineering Group, 2020)

The installation of a traffic signal can serve as a mitigation measure when a significant impact is identified at an unsignalized intersection and traffic signal warrants are satisfied. If warrants are not satisfied, traffic signals would not be considered as a feasible mitigation. For cases in which peak hour traffic signal warrants are satisfied, traffic signals are not considered to be the default mitigation measure. Since installation of traffic signals typically includes construction of additional lanes or widening of the intersection, the development of recommendations for mitigation measures includes consideration of widening the intersection to add capacity while maintaining stop-sign control. If the addition of lanes results in acceptable levels of service then the installation of traffic signals may be considered over-mitigation and may not be recommended, even if peak-hour traffic signal warrants are satisfied.

Existing

Table 20 presents the results of the intersection operational analyses. Levels of service worse than the target LOS, and the corresponding delays, are indicated in bold type and are underlined. The results of the peak-hour traffic signal analyses at unsignalized intersections of major streets are also presented.

The results of the intersection analyses indicate that the intersection of Grantland and Bullard Avenues currently operates below the target LOS during the a.m. peak hour with peak-hour warrants satisfied. The intersection operates at acceptable LOS during the p.m. peak hour. All of the other study intersections are operating at acceptable LOS. Queues exceeding the storage capacity occur at the following intersections:

- Grantland Avenue / Shaw Avenue: southbound left-turn lane during the a.m. peak hour;
- Polk Avenue / Shaw Avenue: southbound left-turn lane during the a.m. and p.m. peak hours.

Table 20
Intersection LOS Summary – Existing Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Warrant	Delay (sec)	LOS	Warrant
Grantland/Bullard	TWS	**37.2**	**E**	Met	34.5	D	Not Met
Grantland/Barstow	TWS	17.0	C	Not Met	17.2	C	Not Met
Grantland/San Ramon	OWS	10.0	B	-	9.6	A	-
Grantland/San Jose	OWS	16.6	C	-	15.9	C	-
Grantland/Shaw	TS	19.8	B	-	20.7	C	-

Polk/Shaw	TS	33.2	C	-	29.9	C	-

Notes: TW – Two Way Stop; OWS – One Way Stop; TS – Traffic Signal
Source: (Peters Engineering Group, 2020)

Existing-Plus-Project Traffic Volumes

The existing-plus-Project conditions analyses represent conditions that would occur after construction and occupancy of the entire Project in the absence of other pending projects and regional growth. This scenario isolates the specific impacts of the Project. With the exception of the intersection of Grantland and Bullard Avenues, the study intersections are expected to continue to operate at acceptable LOS with queuing conditions similar to the existing conditions.

The Project is expected to cause the LOS to drop from D to E during the p.m. peak hour at the intersection of Grantland and Bullard Avenues, although peak-hour traffic signal warrants are not expected to be satisfied during the p.m. peak hour. The Project is also expected to exacerbate delays by 5.0 seconds at the intersection of during the a.m. peak hour, when peak hour traffic signal warrants are already satisfied. These are considered significant impacts during both the a.m. and p.m. peak hours.

To operate at acceptable LOS in the existing-plus-Project conditions, the intersection of Grantland and Bullard Avenues will require signalization. The intersection is included in the City of Fresno Traffic Signal Mitigation Impact (TSMI) fee program and the City of Fresno has initiated the construction phase of a capital improvement project to install traffic signals at the intersection. The conditions are summarized in Table 21.

Table 21
LOS Summary – Improved Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour Delay (sec)	LOS	P.M. Peak Hour Delay (sec)	LOS
Grantland/Bullard	Signals	17.2	B	13.9	B

Source: (Peters Engineering Group, 2020)

Near-Term-Plus-Project Traffic Volumes

The near-term with-Project conditions analysis represent conditions that are expected to occur after construction and occupancy of the Project plus construction of the cumulative projects. This scenario estimates the near-term

cumulative impacts.

At the intersection of Grantland and Barstow Avenues, the cumulative near-term projects and the proposed Project are expected to cause the LOS to drop to E during the a.m. peak hour and F during the p.m. peak hour. Peak-hour traffic signal warrants are only expected to be satisfied during the p.m. peak hour. To operate at acceptable LOS, the intersection will require signalization, including the addition of left-turn lanes on the eastbound and westbound approaches to accommodate eight-phase operations. The intersection is included in the City's TSMI fee program. The conditions are summarized in Table 22.

Table 22
LOS Summary – Improved Near-Term With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Grantland/Barstow	Signals	15.5	B	15.4	B
Polk/Shaw	Signals	37.9	D	34.1	C

Source: (Peters Engineering Group, 2020)

At the intersection of Polk and Shaw Avenues, the cumulative near-term projects and the proposed Project are expected to cause the LOS to drop to F during both peak hours. In order to operate at acceptable LOS, the intersection would require widening to add a second left turn lane and a second through lane on the westbound approach and a dedicated right-turn lane on the northbound approach while maintaining the number of all other existing lanes. An overlapping right-turn phase is recommended for the right-turn lane on the northbound approach. Existing buildings and businesses are within the limits of the widening that would be required in the cumulative condition.

The City has been aware of the congestion anticipated at the intersection and will consider potential improvements to improve traffic operations at the Polk and Shaw Avenues intersection. It is noted that the Project alone does not cause the LOS to drop below D. Payment of the City TSMI fee is recommended as a provision commensurate with the level of impact to sufficiently improve the overall transportation system, and the Project will pay this fee. The intersection of Grantland and Bullard Avenues, the intersection of Grantland and Shaw Avenues, and the site access intersections are expected to continue to operate at acceptable LOS.

Cumulative

The year 2040 With-Project conditions analyses are based on the assumption that the Project site is developed with the proposed Project and regional growth has occurred in accordance with the City of Fresno General Plan. This scenario estimates the long-term cumulative impacts.

It should be noted that there are two key factors that are expected to improve traffic operations at the study intersections in this scenario as opposed to the near-term scenario and the year 2040 no-Project conditions. The construction of the Veterans Boulevard interchange and completion of Veterans Boulevard between SR 99 and Grantland Avenue is expected to reduce traffic volumes at several study intersections. Furthermore, the proposed Project is expected to generate fewer trips than would occur at the site in the no-Project scenario considering the current land use designations.

Roadway intersection conditions are summarized in Table 23. At the intersection of Grantland and Barstow Avenues, the cumulative regional growth and the proposed Project are expected to cause the LOS to drop to F during the a.m. and p.m. peak hours. Peak-hour traffic signal warrants are only expected to be satisfied during the p.m. peak hour. To operate at acceptable LOS, the intersection will require signalization, including the addition of left-turn lanes on the eastbound and westbound approaches to accommodate eight-phase operations. The intersection is included in the City of Fresno TSMI fee program.

Table 23
Intersection LOS- Conditions with Project

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Grantland/Barstow	Signals	16.8	B	16.9	B
Polk/Shaw	Signals	37.6	D	32.3	C

Source: (Peters Engineering Group, 2020)

At the intersection of Polk and Shaw Avenues, the cumulative regional growth and the proposed Project are expected to cause the LOS to drop to F during both peak hours. In order to operate at acceptable LOS, the intersection would require widening to add a second left turn lane and a second through lane on the westbound approach and a dedicated right-turn lane on the northbound approach while maintaining the number of all other existing lanes. An overlapping right-turn phase is recommended for the right-turn lane on the northbound approach (Peters Engineering Group, 2020).

The City has been aware of the future congestion anticipated at the intersection

and has initiated feasibility studies including the adjacent interchange that will consider potential improvements to improve traffic operations at the intersection. Payment of the City of Fresno TSMI fee is recommended as a provision commensurate with the level of impact to sufficiently improve the overall transportation system. The Project will be required to pay its fair share percentage impact of the study intersections identified above.

The intersection of Grantland and Bullard Avenues, the intersection of Grantland and Shaw Avenues, and the site access intersections are expected to continue to operate at acceptable LOS.

Conclusion

Based on the analysis summarized herein, it was found that the intersection of Grantland and Bullard Avenues currently operates below the target LOS during the a.m. peak hour with peak-hour warrants satisfied. The other study intersections are operating at acceptable LOS. Queues exceeding the storage capacity occur at the following intersections:

- Grantland Avenue / Shaw Avenue: southbound left-turn lane during the a.m. peak hour;
- Polk Avenue / Shaw Avenue: southbound left-turn lane during the a.m. and p.m. peak hours.

The Project applicant/developer will participate in the City of Fresno TSMI fee program, Fresno Major Street Impact Fee Program, and Regional Transportation Impact Fee Program by paying the applicable fees in place at the time of development. The Project will be required to pay a pro rata share for off-site roadway improvements as noted above, which are planned and include those fee programs. The proposed Project would therefore not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The Project impacts are considered **less than significant.**

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Pursuant to SB 743, PRC Section 21099, and CCR Section 15064.3(a), generally, vehicle miles traveled (VMT) is the most appropriate measure of transportation impacts. Therefore, the transportation analysis herein evaluates impacts using VMT.

The City adopted CEQA Guidelines for Vehicle Miles Traveled Thresholds, referred to herein as the City of Fresno VMT Thresholds, dated June 25, 2020, pursuant to Senate Bill 743 to be effective as of July 1, 2020. The City of Fresno VMT Thresholds document was prepared and adopted in a manner consistent with the requirements of CEQA Guidelines Sections 15064.3 and 15064.7.

The VMT technical advisory prepared by OPR acknowledges that certain activities and projects may result in a reduction in VMT and GHG emissions and therefore a less than significant impact to transportation and circulation. As such, the City VMT Thresholds adopted a screening standard and criteria that can be used to screen out qualified projects that meet the adopted criteria from needing to prepare a detailed VMT analysis.

As established in the City's adopted VMT Thresholds, development projects that have specific attributes may be presumed to create a less than significant impact, including that the project is located in a low-VMT zone (residential and office projects only) and incorporate similar features (i.e., density, mix of uses, transit accessibility, will tend to exhibit similarly low VMT. As noted above, the VMT threshold target in the City is 13% of the average County VMT per capita.

As noted in Section VIII GREENHOUSE GAS EMISSIONS (b), Fresno COG has developed a VMT screening map as a first step for determining applicability for further VMT analysis. According to the VMT screening map the Project's parcel meets the applicable threshold for screening because it is anticipated that Average VMT/capita is 13.65, making it 87% or less than the regional average, and therefore it can be screened out of further VMT analysis.

Therefore, the impacts are **less than significant.**

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The Project will be designed to current standards and safety regulations. All intersections will be constructed to comply with the City and Caltrans regulations, and design and safety standards of Chapter 33 of the CBC and the guidelines of Title 24 in order to create safe and accessible roadways. Traffic calming elements will be reviewed and approved prior to the T-6294's Final Map, which can improve roadway safety.

The Project site would be directly accessible via two access points on Grantland Avenue. Road sections and circulation connections are designed to meet projected traffic demands, safety objectives, emergency vehicle needs, and walkability objectives. Vehicles exiting the subdivision will be provided with a clear view of the roadway without obstructions. Landscaping associated with the entry driveways could impede such views if improperly installed. All roadway improvements would be required to comply with the City of Fresno Public Works Department development standards. Furthermore, improvements would be subject to all requirements as outlined in Standards for Traffic Engineering and would, in turn, reduce or eliminate any design features or line-of-sight obstructions that would potentially create substantially hazardous conditions. Specific circulation patterns and roadway designs will incorporate all applicable safety measures to ensure that hazardous design features or inadequate emergency access to the site or other areas surrounding the Project area would not occur.

The implementation of the design standards, including pedestrian and bike paths, would improve pedestrian and cyclist safety. The Project would not alter pedestrian or vehicle access to the Project site or introduce incompatible design features or equipment that would substantially increase the risk of hazards. Therefore, with the incorporated design features and compliance with all applicable rules and regulations, the Project will have a **less than significant** impact**.**

d) Result in inadequate emergency access?

The Project does not involve a change or inhibit the ability of local roadways to continue to accommodate emergency response and evacuation activities, nor interfere with the City's adopted emergency response plan. The Project has been reviewed by the City's Traffic Engineering Division and Fire Department to impose standard conditions to ensure adequate site access, including emergency access. In the event that construction requires lane closures, access would be required to be maintained along Grantland Avenue through standard traffic control, and therefore, potential lane closures would not affect emergency evacuation plans. Per Fresno Fire Department Policy No. 403.002, all weather fire access must be provided, inspected and in service (approved) prior to the delivery of combustible material to the location and maintained throughout the project without interruption Thus, a **less than significant** impact would occur.

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. TRIBAL CULTURAL RESOURCES – Would the Project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:		X		
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC section 5020.1(k), or,		X		
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC section 5024.1. In applying the criteria set forth in subdivision (c) of PRC section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X		

The analysis in this section is based on the Cultural Resources Technical Memo (QK, 2025d), prepared for the Project and attached as Appendix D.

DISCUSSION

a) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

The State requires lead agencies to consider the potential effects of proposed Projects and consult with California Native American tribes during the local planning process for the purpose of protecting Traditional Tribal Cultural Resources through the CEQA Guidelines. Pursuant to PRC Section 21080.3.1, the lead agency shall begin consultation with the California Native American tribe that is traditionally and culturally affiliated with the geographical area of the proposed Project. Such significant cultural resources are either sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe which is either on or eligible for inclusion in the California Historic Register or local historic register, or, the lead agency, at its discretion, and support by substantial evidence, choose to treat the resources as a Tribal Cultural Resources (PRC Section 21074(a)(1-2)).

Pursuant to AB 52, the Table Mountain Rancheria of California and Dumna Wo Wah Tribal Government were invited to consult under AB 52. The City mailed notices of the proposed Project to each of these tribes on February 12, 2026, which included the required 30-day time period required by AB 52, and ended on March 16, 2026. Neither tribe decided to request consultation for the Project during the required comment period.

As noted in V. CULTURAL RESOURCES (a)-(c), the records search indicated that the project had never been surveyed for cultural resources, and it is not known if any exist on the Project site. Six cultural resource studies have been conducted within a half mile of the Project. Twelve historic-era cultural resources have been recorded within one half mile of the project. These include a segment of the Herndon Canal which runs adjacent to the northern project boundary, the Epstein Canal, and ten residential and commercial buildings that date prior to 1980. None of which will not be impacted by the proposed development of the Project. No additional cultural resources have been identified within half a mile of the project.

The Cultural Resources Technical Memo prepared for the Project did not identify any tribal or archaeological cultural resources within the Project. However, if such resources are discovered during construction activities, adherence to Mitigation Measure CUL-1 would reduce potential impacts to unknown tribal and cultural resources to less than significant.

In conclusion, with mitigation measures incorporated, the Project will not result in any significant impacts related to tribal cultural resources, and the Project impacts are considered **less than significant with mitigation incorporated.**

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Please see the discussion under Section a)i., above.

If any artifacts are inadvertently discovered during ground-disturbing activities, existing federal, State, and local laws and regulations would require construction activities to cease until such artifacts are properly examined and determined not to be of significance by a qualified cultural resource professional. Adherence to Mitigation Measure CUL-1 would reduce potential impacts to unknown tribal and cultural resources to less than significant.

In conclusion, with mitigation measures incorporated, the Project will not result in any significant impacts related to tribal cultural resources, and the Project impacts are considered **less than significant with mitigation incorporated.**

Mitigation Measures

The proposed project shall implement and incorporate, as applicable, the cultural resources related mitigation measures identified.

Mitigation Measure CUL-1: If cultural resources (i.e., prehistoric sites, historic sites, and isolated artifacts and features) are discovered during the course of construction, work shall be halted immediately within 50 meters (165 feet) of the discovery, the City of Fresno shall be notified, and a qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to determine the significance of the discovery.

The City of Fresno shall consider mitigation recommendations presented by the qualified archaeologist for any unanticipated discoveries and future project proponents shall carry out the measures deemed feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. The project proponent shall be required to implement any mitigation necessary for the protection of cultural resources.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS – Would the Project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effect?			X	
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	
c) Result in a determination by the waste water treatment provider, which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?			X	
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			X	

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			X	

DISCUSSION

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The Project site is within city limits and thus, will be required to connect to water, stormwater, solid waste, and wastewater services. Electricity and telecommunications will be provided by private companies. The Project site is undeveloped but is located within an urban neighborhood surrounded by existing uses, thus there is existing utility infrastructure including water, sewer, stormwater, electricity, and telecommunication services to which the Project would connect. Further, development of the Project site has been reviewed by the City and responsible agencies through the entitlement review process. The entitlement review process ensures that the future development is developed in accordance with applicable regulations including the permitted intensity and density development standards.

Impacts to storm drainage facilities have been previously discussed in Section X, HYDROLOGY AND WATER QUALITY. Long-term operation impacts associated with the proposed Project would be less than significant level because the Project will comply with FMFCD's Storm Drainage and Flood Control Master Plan (SDFCMP), which manages FMFCD's stormwater drainage systems.

The City's Department of Public Utilities has determined that adequate sanitary sewer and water services would be available to serve the proposed Project subject to the payment of any applicable connection charges and/or fees and extension of services in a manner which is compliant with the Department of Public Utilities standards, specifications, and policies. The proposed Project would be subject to the payment of any applicable connection charges and/or fees and extension of

services in a manner that is compliant with the Department of Public Utilities standards, specifications, and policies. Construction and operation of sewer infrastructure for the Project would be typical of such facilities, and there is no evidence to suggest that it would result in any additional significant effects not evaluated herein. For these reasons, it can be determined that the Project would not require or result in the relocation or construction of new or expanded facilities in a manner that would cause significant environmental effects. As a result, impacts would be **less than significant**.

b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?

As discussed under Sections VII HYDROLOGY AND WATER QUALITY (b, c(i)-c(iii) and e, the proposed Project is anticipated to use approximately 145.16 acre-feet of water annually. The Project will obtain water by connecting to City utility services. The long-term average daily operational water demand will be for the residential users and is anticipated to be approximately 47.3 million gallons per year or 145.16 acre-feet per year for the total build out of the Project (QK, 2025e). This is based on each residential unit having an average water demand of 693 gallons per day (based on the 198-gallon per capita/day average in the 2020 City of Fresno Urban Water Management Plan and 3.5 people per unit) across the entire buildout of 187 units for the Project.

As noted previously, the Department of Public Utilities would have adequate water supply to meet all demands through the year 2045 even under the multiple dry-year drought condition scenario. Based on the 2020 UWMP, the water supplies for the City (336,570 Acre Feet (AF)/year) are adequate to accommodate the demand in the City by 2045 (i.e., 241,447 AF/year). The proposed Project buildout would result in approximately 145.16 AF/year of water demand which is 0.043 percent of the available water supply of the City in the worst-case scenario of the fifth year of the five consecutive dry year supply and demand comparison (Table 21).

As a result, there would be sufficient water supply for the Project, and the impact would be **less than significant.**

c) Result in a determination by the wastewater treatment provider, which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?

The City of Fresno Department of Public Utilities (DPU) acts as the regional sewer agency and is responsible for operating the Regional Wastewater Reclamation

Facility (RWRF) and the North Fresno Wastewater Reclamation Facility (NFWRF). The RWRF provides wastewater treatment for a service area that includes most of the cities of Fresno and Clovis, and some unincorporated areas of Fresno County. The proposed Project is not expected to exceed wastewater treatment requirements of the DPU. The Project would be serviced by the RWRF.

The RWRF has a capacity of 92 Million Gallons per Day (MGD), with an average annual flow of approximately 56 MGD (City of Fresno Planning and Development Department, 2025a). The Specific Plan Area at full buildout will generate 11.4 MGD; given this, the RWRF facilities have capacity to accommodate the full buildout of the Specific Plan (City of Fresno Planning and Development Department, 2025a) (City of Fresno Planning and Development Department, 2025c). The Project is consistent with the subject parcel's land use designation of Residential Medium Density.

The City's Department of Public Utilities has determined that adequate sanitary sewer and water services would be available to serve the proposed Project subject to the payment of any applicable connection charges and/or fees and extension of services in a manner which is compliant with the Department of Public Utilities standards, specifications, and policies. The proposed Project would be subject to the payment of any applicable connection charges and/or fees and extension of services in a manner that is compliant with the Department of Public Utilities standards, specifications, and policies. Construction and operation of sewer infrastructure for the Project would be typical of such facilities, and there is no evidence to suggest that it would result in any additional significant effects not evaluated herein.

Therefore, the impacts are **less than significant.**

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

The City of Fresno Department of Public Utilities, Solid Waste Division has reviewed the Project for compliance with any federal, State, and local management and reduction statutes and regulations related to solid waste.

Solid waste in Fresno is largely diverted away from landfills and into recycling and composting (City of Fresno Planning and Development Department, 2025a). The Solid Waste Division of the City of Fresno provides curbside collection through a three-cart system including solid waste, recycling, and green waste, as well as waste oil and waste oil filters weekly. Garbage disposed of in the City of Fresno is

taken to Cedar Avenue Recycling and Transfer Station (CARTS). Once trash has been off-loaded at the transfer station, it is sorted, and non-recyclable solid waste is loaded onto large trucks and taken to the American Avenue Landfill located approximately six miles southwest of Kerman.

The American Avenue Landfill (i.e., American Avenue Disposal Site 10-AA-0009) has a maximum permitted capacity of 32,700,000 cubic yards and a remaining capacity of 29,358,535 cubic yards, with an estimated closure date of August 31, 2031 (City of Fresno Planning and Development Department, 2025a). The maximum permitted throughput is 2,200 tons per day. Other landfills within the County of Fresno include the Clovis Landfill (City of Clovis Landfill 10-AA-0004) with a maximum remaining permitted capacity of 7,740,000 cubic yards, a maximum permitted throughput of 2,000 tons per day, and an estimated closure date of 2047 (City of Fresno Planning and Development Department, 2025a). Green waste hauled by the residential solid waste operations is delivered to one of two locations; Earthwise/Green Valley Recycling located at 2365 North Avenue and West Coast Waste at 30777 Golden State Frontage Road (City of Fresno Planning and Development Department, 2025a).

According to the Specific Plan's Recirculated Draft EIR, single-Unit residential land uses generate approximately 10 lbs/unit/day. Therefore operation of the proposed Project is expected to generate approximately 1,870 pounds of solid waste per day or about 341.37 tons of solid waste per year. Given the available capacity at the landfills, the additional solid waste generated by the proposed Project is not anticipated to cause the facilities to exceed their daily permitted capacity. As such, the Project would be served by a landfill with sufficient capacity to accommodate the Project's waste disposal needs, and impacts associated with the disposition of solid waste would be **less than significant.**

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Project construction and operational activities that generate solid waste will be handled, transported, and disposed of in accordance with applicable federal, State, and local regulations pertaining to municipal waste. The 1989 California Integrated Waste Management Act requires jurisdictions to attain specific waste diversion goals (City of Fresno Planning and Development Department, 2025a). In addition, the California Solid Waste Reuse and Recycling Access Act of 1991, as amended, requires expanded or new development Projects to incorporate storage areas for recycling bins into the proposed Project design. Reuse and recycling of construction debris would reduce operating expenses and save valuable landfill space. With development in accordance with the General Plan, solid waste will

continue to be handled, transported, and disposed of according to all applicable federal, State, and local regulations pertaining to municipal waste disposal.

The recycling of construction and demolition materials is required for any City-issued building, relocation, or demolition permit that generates at least eight cubic yards of material by volume. The Project would generate solid waste during construction and operation of the new single-Unit residences. Common construction waste may include metals, masonry, plastic pipe, rocks, dirt, cardboard, or green waste related to land development. AB 939 requires the City of Fresno to attain specific waste diversion goals. The waste disposal facilities listed above have adequate capacity to accept construction waste from potential new facilities. The proposed Project would comply with Cal Green, the City's Construction and Demolition (C&D) Waste Management Guide, and with waste management policies and recommendations from the General Plan.

The proposed Project would dispose of waste in accordance with applicable federal, state, and local recycling, reduction, and waste requirements and policies. Therefore, the proposed Project would not conflict with federal, state, and local management and reduction statutes and regulations related to solid waste, and the impact would be **less than significant.**

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			X	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?			X	
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?			X	
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?			X	

DISCUSSION

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

See previous discussion in IX. HAZARDS AND HAZARDOUS MATERIAL f) regarding emergency response plan or emergency evacuation plan.

The City of Fresno's Police and Fire Departments are tasked with all local emergency response efforts. In addition, the City's full-time EPO is responsible for ensuring that Fresno's emergency response plans are up-to-date and implemented properly. The EPO also facilitates cooperation between City departments and other local, State and federal agencies that would be involved in emergency response operations. The proposed Project would not interfere with any emergency evacuation routes within the City of Fresno or an adopted emergency response plan. The Project site would develop a portion of North Grantland Avenue and develop internal circulation roads, which would improve emergency access. The Project would not conflict with the goals and objectives of the FCMHMP, including Objective 1.3, which requires the improvement of transportation corridors to allow for better evacuation routes for the public and better access for emergency responders (City of Fresno Planning and Development Department, 2025a). All Project plans submitted to the City will be reviewed for compliance with federal, State and local regulations related to emergency access. The Project is required to comply with all local, State, and federal regulations related to emergency preparedness, and would not result in significant environmental impacts. Therefore, the impact would be **less than significant.**

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

See IX. HAZARDS AND HAZARDOUS MATERIAL (g). The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point.

None of the Plan Area is located within an SRA or High Fire Severity Zone, this includes the Project site (City of Fresno Planning and Development Department, 2025a). The Project site does not possess physical characteristics that would exacerbate wildfire risks, because it is located on a relatively flat slope will be built out with single-unit residences and associated infrastructure including open space. Therefore, the proposed Project would not exacerbate wildfire risks and potentially

expose Project occupants to pollutants from a wildfire. The impact would be **less than significant**.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

See discussion under Impact XX. WILDFIRE (b) above. The Project site is located in a developed area of the City and it would not require the installation or maintenance of infrastructure that would increase the risk of fire or result in temporary or ongoing environmental impacts, outside of what is already implemented according to City plans. Additionally, all new single-unit residences would be required to comply with federal, State, and local health and safety regulations, development standards, building codes, and other laws and regulations that govern fire protection and suppression. As a result, a **less than significant impact** would occur.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

See discussions in VII. GEOLOGY AND SOILS iv), X. HYDROLOGY AND WATER QUALITY c) iii, c) iv and d) related to landslides, drainage and flood hazards and WILDFIRE (b) above.

The Project site is not within a flood hazard zone designated by FEMA, there are no landslide zones in the County and the site itself is flat (Federal Emergency Management Agency, 2009) (City of Fresno Planning and Development Department, 2025a). Subsection b) above discusses that the Project site presents a less than significant impact related to wildfire risk. Therefore, the proposed Project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes and a **less than significant impact** would occur.

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects)?		X		
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			X	

DISCUSSION

a) Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?

As evaluated in this IS/MND, the proposed Project would not substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory.

With Mitigation Measures BIO-1 through BIO-9 and Mitigation Measure 3.5-2 and 3.5-3, the proposed Project would not have the potential to degrade the quality of the environment, significantly impact biological resources, or eliminate important examples of the major periods of California's history or prehistory. Therefore, with the aforementioned mitigation measures, the Project would have a **less than significant impact.**

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

As described in the impact analyses above, any potentially significant impacts of the proposed Project would be reduced to less than significant levels following the incorporation of the mitigation measures listed. The proposed Project would not otherwise combine with the impacts of related development to add considerably to any cumulative impacts in the region. With Mitigation Measures BIO-1 through BIO-9, CUL-1 through CUL-2, ENG-1, and GEO-1, the proposed Project would not have impacts that are individually limited but cumulatively considerable. Therefore, the Project would have a **less significant impact with mitigation incorporated.**

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

All of the Project's impacts, both direct and indirect, that are attributable to the Project were identified and mitigated. No significant impacts which could affect the health or safety of human beings were identified or required mitigation. Therefore,

the proposed Project would not either directly or indirectly cause substantial adverse effects on human beings and the impact would be **less than significant**.

References

California Air Resources Board (CARB). (2022). *In-Use Off-Road Diesel-Fueled Fleets Regulation*. Retrieved from https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/off-roaddiesel/appa-1.pdf

California Department of Conservation. (2025, September 29). *CalGEM Well Finder*. Retrieved from https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx

California Energy Commission. (2022). *2022 Single-Family Solar PV*. Retrieved August 27, 2025, from https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/energy-code-support-center/2022-0

California Public Utilities Commission. (2023, April). *CPUC Reduces Incentives for Natural Gas To Better Align With State's Climate Goals*. Retrieved January 2025, from https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-reduces-incentives-for-natural-gas-to-better-align-with-state-climate-goals-2023

Central Unified School District (CUSD). (2021). *Facilities Master Plan.*

Central Unified School District. (2026, February 5). \.

City of Fresno. (2020). *Fresno Trail Network Expansion Feasibility Plan.*

City of Fresno Planning and Development Department. (2025a). *Recirculated Draft Environmental Impact Report for the West Area Neighborhood Specific Plan.*

City of Fresno Planning and Development Department. (2025b). *West Area Neighborhood Specific Plan.*

City of Fresno Planning and Development Department. (2025c). *Final Environmental Impact Report for the West Area Neighborhood Specific Plan.*

City of Fresno Planning and Development Department. (2025c). *Finding of Fact / Statement of Overriding Considerations for the West Area Neighborhoods Specific Plan.*

Department of Toxic Substances Control. (2025, September 27). *EnviroStor Hazardous Waste and Substances List (Cortese)*. Retrieved September 27, 2025

ESRI, Mark Gilbert. (2021, July 13). *Wildland Urban Interface*. Retrieved from https://www.arcgis.com/home/item.html?id=a4985d64969743db8feddf01c96c9435

Federal Emergency Management Agency. (2009, February 18). *FEMA Flood Map Service Center: Search By Address.* Retrieved from https://msc.fema.gov/portal/search?AddressQuery=5326%20North%20Grantland%20Avenue%2C%20fresno%2C%20ca

Fresno Council of Governments. (2024). *Fresno Multi-Jurisdictional 2023-2031 Housing Element.*

Fresno Fire Department. (2026, January 28). Comments to T-6294.

Highway City Community Development. (2025, December). *Teague Community Resource Center*. Retrieved from https://www.highwaycitycd.com/tcrc

Krazan & Associates, Inc. . (2019). *Geotechnical Engineering Investigation* .

Krazan & Associates, INC. (2019). *Phase I Environmental Site Assessment.*

Mitchell Air Quality Consulting. (2020). *Air Quality and Greenhouse Gas Analysis Report Lennar Central Valley Tract No. 6294.*

Pacific Gas & Electric. (2025, December). *Save Energy & Money*. Retrieved from Energy-saving programs: https://www.pge.com/en/save-energy-and-money/energy-saving-programs.html

Peters Engineering Group. (2020). *Applicability of Previous Traffic Impact Study and Updated VMT Analysis and Traffic Impact Study.*

QK. (2025a). *Land Evaluation and Site Assessment (LESA) and Agricultural Conversion Study.*

QK. (2025b). *Air Quality Impact Analysis Lennar Homes VTTM No. 6294.*

QK. (2025c). *Biological Resource Evaluation VTTM 6294.*

QK. (2025d). *Cultural Resources Technical Memorandum- TTM 6294.*

QK. (2025e). *Water Supply Assessment for VESTING TENTATIVE TRACT MAP (VTTM) 6294.*

State Water Resources Control Board. (2025, September 27). *GeoTracker*. Retrieved from https://www.waterboards.ca.gov/ust/electronic_submittal/about.html#:~:text=%E2%80%9CGeoTracker%E2%80%9D%20is%20the%20State%20Board's,both%20regulators%20and%20the%20public.

U.S. Fire Administration . (2022, June 8). *What is the WUI?* Retrieved from https://www.usfa.fema.gov/wui/what-is-the-wui/#:~:text=Share%20on:,Institute%20of%20Standards%20and%20Technology
VRPA Technologies, Inc. (2021). *Draft Memorandum Tract 6294 Vehicle Miles Traveled (VMT) Analysis.*
WJV Acoustics, Inc. (2020). *Acoustical Analysis Tract 6294.*

Mitigation Measure Monitoring Program for Vesting Tentative Tract Map No. 6294

This Mitigation Monitoring and Reporting Program (MMRP) was formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the proposed Tentative Tract Map No. 6294 (project). The MMRP, which is found in Table A of this section, lists mitigation measures recommended in the IS/MND for the proposed project and identifies mitigation monitoring requirements.

This MMRP has been prepared to comply with the requirements of State law (Public Resources Code Section 21081.6). State law requires the adoption of an MMRP when mitigation measures are required to avoid significant impacts. This requirement facilitates the implementation of all mitigation measures adopted through the California Environmental Quality Act (CEQA) process. The MMRP is intended to ensure compliance during implementation of the project.

The MMRP is organized in a matrix format. The first column identifies the mitigation measure. The second column, entitled “Timing for Mitigation Measure,” refers to the implementation and schedule of mitigation measures. The third column, entitled “Mitigation Responsibility,” refers to the party responsible for implementing the mitigation measure. The fourth column, entitled “Monitoring/Reporting Agency,” refers to the agency responsible for oversight or ensuring that the mitigation measure is implemented. The fifth column, entitled “Verification,” will be initialed and dated by the individual designated to verify adherence to the project specific mitigation, when the mitigation measure is completed.

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Table A: Mitigation Monitoring and Reporting Program

Mitigation Measure	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
I. AESTHETICS				
There are no significant impacts to Aesthetics.				
II. AGRICULTURE AND FORESTRY RESOURCES				
There are no significant impacts to Agricultural and Forestry Resources.				
III. AIR QUALITY				
There are no significant impacts to Air Quality.				
IV. BIOLOGICAL RESOURCES				
BIO-1: A pre-construction clearance survey of the Project footprint shall be conducted for special-status wildlife species and nesting migratory birds and raptors. The survey shall occur no less than 14 days prior to the start of construction activities. If construction is delayed beyond 30 days from the time of the survey, then another survey would need to be conducted. The survey shall be conducted by a biologist with adequate training and prior experience conducting surveys for special-status wildlife species. If no special-status species are observed, no further action is warranted. If dens or burrows that could support special-status species and/or nesting birds and raptors are discovered during the pre-construction survey, appropriate avoidance buffers shall be established. If no special-status species are observed on or near the Project site, no further surveys are required.	Within 14 days prior to ground-disturbing activities and again if construction is delayed beyond 30 days from the time of the survey.	Project Developer, Qualified Biologist	Planning and Development Department	

A report outlining the results of the pre-construction survey shall be submitted to the lead agency as evidence of compliance.				
BIO-2: If construction is planned during the nesting season for migratory birds (February 15 to August 31) and nesting birds are identified during the survey, active Swainson's hawk nest shall be avoided by 0.5 miles, other raptor nests shall be avoided by 500 feet and all other migratory bird nests shall be avoided by 250 feet. Avoidance buffers may be reduced if a qualified biological monitor determines that encroachment into the buffer area is not affecting nest building, the rearing of young, or otherwise affecting the breeding behaviors of the resident birds. Because nesting birds can establish new nests or produce a second or even third clutch at any time during the nesting season, nesting bird surveys shall be repeated every 30 days as construction activities are occurring throughout the nesting season. If no nesting birds are observed on or near the Project site, no further surveys are required.	If construction is planned during the nesting season for migratory birds (February 15 to August 31), then within 14 days prior to ground-disturbing activities and repeated every 30 days during construction	Project Developer	Planning and Development Department	
BIO-3: A Worker Environmental Awareness Program shall be developed and implemented for all personnel that could access the site prior to commencing any disturbance activities. The program shall consist of an on-site or center presentation that will describe the locations and types of sensitive plant, wildlife, and sensitive natural communities (collectively, "Biological Resources") on and near the site, an overview of the laws and regulations governing the protection of Biological Resources, the reasons for protecting the Biological Resources, the specific protection and avoidance measures that are applicable to the site, and the identity of designated points of contact should questions or issues arise, including the qualified biologist. The program shall provide training to recognize, avoid, and report to	Prior to the start of construction	Project Developer	Planning and Development Department	

applicable qualified biologists any Biological Resources on the site. a. The Worker Environmental Awareness Program shall emphasize the need to avoid contact with on-site wildlife and avoid entry into areas where Biological Resources have been identified based on pre-disturbance field surveys and to implement the buffer avoidance or other protection measures established by the United States Fish and Wildlife Service identified by the California Department of Fish and Wildlife or required by the Biological Resource mitigation measures. The training shall emphasize the importance of not feeding or domesticating wildlife and the need to avoid any trash, micro trash, or potential food disposal on-site except in animal-proof containers emptied daily to avoid attracting or causing adverse impacts to special status wildlife. b. All on-site personnel must sign a statement verifying that they have completed the Worker Environmental Awareness Program and that they understand and agree to implement the biological requirements for the worksite. If signed employee statements are not available, documentation may be provided by Worker Environmental Awareness Program training records, which shall be kept by the applicant for a minimum of five years. Each applicant shall maintain a list of all persons who have completed the training program and shall provide the list to the County or to State and federal wildlife agency representatives upon request.				

BIO-4: If protected or special-status species are identified on the Project site during pre-construction surveys, protective buffers shall be used, where effective in the opinion of the qualified biologist. These measures are created to avoid any unauthorized incidental take of these species and to minimize any incidental take. Protective buffers shall be delineated using brightly colored stakes and/or flagging or similar materials and remain until construction activities are complete, at which time of completion, the buffers must be removed. Protective buffers shall be established around active dens and/or burrows of special-status animal species or populations of special-status plant species to avoid unauthorized take of protected species as listed in the table below. The protective buffer distance shall be increased if required to avoid unauthorized incidental take of any protected species as determined by a qualified biologist. Protective buffer distances and other avoidance measures that may be implemented to avoid impacts to protected species or sensitive species shall be consistent with the United States Fish and Wildlife Service and/or the California Department of Fish and Wildlife requirements and shall be implemented and overseen by the qualified biologist. If occupied San Joaquin kit fox dens cannot be avoided by the appropriate buffer below, an ITP issued by the CDFW under the California Endangered Species Act (CESA) to authorize "take" that is incidental to an otherwise lawful activity, may be required before any work within the buffer. Disturbance Buffers for Sensitive Resources	During construction	Project Developer, Qualified Biologist	Planning and Development Department	

<table><tr><th>Sensitive Resource</th><th>Buffer Zone from Disturbance (feet)</th></tr><tr><td>Potential San Joaquin kit fox den</td><td>50</td></tr><tr><td>Known San Joaquin kit fox den</td><td>100</td></tr><tr><td>Natal San Joaquin kit fox den</td><td>500</td></tr><tr><td>Atypical San Joaquin kit fox den</td><td>50</td></tr><tr><td>Rodent burrows</td><td>50</td></tr><tr><td>Special-status bird species' active nests</td><td>500 feet to 0.5 miles depending on species and sight line</td></tr><tr><td>American badger: Non-maternity dens</td><td>50</td></tr><tr><td>American badger: Maternity dens</td><td>200</td></tr></table>				
BIO-5: If Project activities must occur during the Swainson's hawk nesting season (February 15 to September 31), pre-activity surveys shall be conducted for Swainson's hawk nests in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (CDFG 2000)*). The surveys would be conducted on the Project site plus a 0.5-mile buffer. To meet the minimum level of protection for the species, surveys shall be conducted during at least two survey periods prior to the start of construction. The survey will be conducted in accordance with the methodology outlined in existing protocols and shall be phased with the construction of the Project. If no Swainson's hawk nests are found, no further action is required.	Within 10 days prior to ground-disturbing activities and before the issuance of grading permits	Project Developer	Planning and Development Department	

BIO-6: If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist shall complete an assessment of the potential for current construction activities to impact the nest. The assessment would consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this Project. Based on this assessment, the biologist will determine if construction activities can proceed and the level of nest monitoring required. Construction activities shall not occur within 500 feet of an active nest, but depending upon conditions at the site, this distance may be reduced. Full-time monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist shall have the authority to stop work if it is determined that Project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nesting Swainson's hawk to disturbances and at the discretion of the qualified biologist.	During construction	Project Developer, Qualified Biologist	Planning and Development Department	
BIO-7: If burrows that could support this species are discovered during the pre-construction clearance survey conducted under Measure BIO-1, the avoidance buffers outlined below should be established, and burrow monitoring shall be conducted in accordance with the California Department of Fish and Game (CDFG) *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). No work shall occur within these buffers. If occupied burrowing owl burrows cannot be avoided by the appropriate buffer below, an ITP issued by the CDFW under the California Endangered Species Act (CESA) to authorize "take" that is incidental to an otherwise lawful	During construction	Project Developer	Planning and Development Department	

<table>
<tr>
<td>activity, may be required before any work within the buffer.

<table>
<tr><td rowspan="2">Location</td><td rowspan="2">Time of Year</td><td colspan="3">Level of Disturbance</td></tr>
<tr><td>Low</td><td>Med</td><td>High</td></tr>
<tr><td>Nesting sites</td><td>April 1 -Aug 15</td><td>200 m*</td><td>500 m</td><td>500 m</td></tr>
<tr><td>Nesting sites</td><td>Aug 16 – Oct 15</td><td>200 m</td><td>200 m</td><td>500 m</td></tr>
<tr><td>Nesting sites</td><td>Oct 16- Mar 31</td><td>50 m</td><td>100 m</td><td>500 m</td></tr>
</table>
*Meters (m)</td>
<td></td><td></td><td></td><td></td>
</tr>
<tr>
<td>BIO-8: Occupied American badger dens detected during pre-disturbance surveys shall be flagged, and ground-disturbing activities avoided within 50 feet of the den. Maternity dens shall be avoided, and a minimum 200-foot buffer from disturbance shall be maintained during the pup-rearing season (February 15 through July 1). Maternity dens must be avoided to the maximum extent feasible in the opinion of a qualified biologist. If an active maternity den is proposed to be disturbed, the qualified biologist shall consult with the California Department of Fish and Wildlife to identify any appropriate additional minimization measures which the qualified biologist determines, with the wildlife agencies, can actually be implemented based on field conditions. All such measures shall be implemented for Project activities.</td>
<td>During construction</td><td>Project Developer, Qualified Biologist</td><td>Planning and Development Department</td><td></td>
</tr>
<tr>
<td>BIO-9: The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Protected and Sensitive Species:
1. All vehicles shall observe a 20-mile-per-hour speed limit in all areas of disturbance and on unpaved roads unless otherwise posted. Off-road</td>
<td>During construction</td><td>Project Developer</td><td>Planning and Development Department</td><td></td>
</tr>
</table>

traffic outside of designated access routes is prohibited. Speed limit signs shall be posted in visible locations at the point of site entry and at regular intervals on all unpaved access roads. 2. All disturbance activities, except emergency situations or drilling that may require continuous operations, shall only occur during daylight hours. Nighttime disturbance activity for drilling purposes shall use directed lighting and shielding methods and comply with applicable lighting mitigation measures. 3. All food-related trash items and all forms of micro trash, such as wrappers, cans, bottles, bottle tops, and food scraps, shall be disposed of in closed, animal-proof containers and removed daily from the site. 4. Excavations, spoils piles, access roadways, and parking and staging areas shall be subject to dust control as set forth in the dust control mitigation measures. 5. The use of herbicides for vegetation control shall be restricted to those approved by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife. No rodenticides shall be used on any site unless approved by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife and shall observe label and other restrictions mandated by the United States Environmental Protection Agency, California Department of Food and Agriculture, and State and federal laws and regulations. For split estates, no herbicides for vegetation control may occur in Tier 2 areas without surface owner approval.				

6. No plants or wildlife shall be collected, taken, or removed from the site or any adjacent locations except as necessary for Project-related vegetation removal or wildlife relocation by a qualified biologist and subject to all applicable permits and authorizations. 7. All open trenches or excavations shall be covered at the end of each workday to prevent wildlife entrapment. If an excavation is too large to cover, escape ramps shall be installed at an incline ratio of no greater than 2:1. All trenches and pipes shall be inspected for the presence of wildlife each day prior to the commencement of work. 8. To enable San Joaquin kit foxes and other wildlife to pass through the Project site, any perimeter fencing shall include a four- to eight-inch opening between the fence mesh and the ground, or the fence shall be raised four inches above the ground except blunt-nosed leopard lizard exclusion fencing. The bottom of the fence fabric shall be knuckled (wrapped back to form a smooth edge) to protect wildlife. 9. All vertical tubes used in Project construction and chain link fencing poles shall be temporarily or permanently capped to avoid the entrapment and death of special-status wildlife and birds. All pipes 1.5 inches or greater in diameter stored overnight on a Project location must have end caps or other physical barriers that prevent wildlife from entering the pipe. 10. All dead or injured special-status wildlife shall be left in place and reported to the United States Fish and Wildlife Service and the California Department of Fish and Wildlife within 48 hours of discovery for rescue or salvage. Discovery of				

State or federal listed species that are injured or dead shall also be managed consistent with regulatory requirements, including being reported immediately via telephone and within 24 hours in writing, and with a copy to City of Fresno Planning Division. 11. All drilling installations and operations will comply at all times with the applicable federal, State, County, and local law ordinances and regulations. 12. During pre-construction surveys, the qualified biologist shall delineate previously disturbed areas to be used by the applicant to minimize the amount of new disturbance. 13. All concrete and asphalt debris shall be removed from the site for recycling or disposal at an authorized, permitted facility. 14. No vehicles or construction equipment shall be parked within a wetland or waterbody/dry wash. 15. Tracked vehicles and other construction equipment shall be washed or maintained to be weed-free prior to entering and working within areas of a new disturbance. 16. All washing of trucks, paint, equipment, or similar activities shall occur in areas where runoff is fully contained for collection and off-site disposal. Wash water may not be discharged from the site and shall be located at least 100 feet from any water body or sensitive Biological Resources. 17. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries or waterbody, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.				

18. All areas that shall be avoided as a result of the pre-disturbance surveys and areas where new disturbance will occur shall be clearly delineated by fencing or staking and flagging and/or rope or cord. 19. No pets shall be allowed on any site. 20. No smoking may occur except in designated areas.				
V. CULTURAL RESOURCES				
Mitigation Measure CUL-1: If cultural resources (i.e., prehistoric sites, historic sites, and isolated artifacts and features) are discovered during the course of construction within the Project Area, work shall be halted immediately within 50 meters (165 feet) of the discovery, the City of Fresno shall be notified, and a qualified archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to determine the significance of the discovery. The City of Fresno shall consider mitigation recommendations presented by the qualified archaeologist for any unanticipated discoveries and the project proponent shall carry out the measures deemed feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. The project proponent shall be required to implement any mitigation necessary for the protection of cultural resources.	During construction	Project Developer	Planning and Development Department	
Mitigation Measure CUL-2: If human remains are found during ground disturbance activities associated with implementation of the Project, there shall be no further excavation or disturbance within 50 feet of the discovery	During construction	Project Developer	Planning and Development Department	

and a qualified archaeological monitor and the coroner of Fresno County shall be contacted as stated in Health and Safety Code Section 7050.5. If it is determined that the remains are Native American, the coroner shall contact the Native American Heritage Commission within 24 hours. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descendent (MLD) from the deceased Native American. The MLD may then make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and associated grave goods as provided in Public Resources Code section 5097.98. The landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further disturbance if: a) the Native American Heritage Commission is unable to identify a MLD or the MLD failed to make a recommendation within 24 hours after being notified by the commission; b) the descendent identified fails to make a recommendation; or **c)** the landowner or his authorized representative rejects the recommendation of the descendent, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.				
VI. ENERGY				

Mitigation Measure ENG-1: Prior to the issuance of building permits, the project applicant(s) shall show on the building plans that all major appliances (dishwashers, refrigerators, clothes washers, and dryers) to be provided/installed are Energy Star-certified appliances or appliances of equivalent energy efficiency. Installation of Energy Star-certified or equivalent appliances shall be verified by the City of Fresno Planning and Development Department prior to the issuance of a certificate of occupancy.	Prior to the Issuance of Project Building Permits	Project Developer	Planning and Development Department	
VII. GEOLOGY AND SOILS				
Mitigation Measure GEO-1: If any paleontological resources are found during grading and construction activities, all work shall be halted immediately within a 200-foot radius of the discovery until a qualified paleontologist has evaluated the find. Work shall not continue at the discovery site until the paleontologist evaluates the find and makes a determination regarding the significance of the resource and identifies recommendations for conservation of the resource, including preserving in place or relocating within the Plan Area, if feasible, or collecting the resource to the extent feasible and documenting the find with the University of California Museum of Paleontology.	During construction	Project Developer	Planning and Development Department	
VIII. GREENHOUSE GAS EMISSIONS				
There are no significant impacts to Greenhouse Gas Emissions.				
IX. HAZARDS AND HAZARDOUS MATERIALS				
There are no significant impacts to Hazards and Hazardous Materials.				
X. HYDROLOGY AND WATER QUALITY				

There are no significant impacts to Hydrology and Water Quality.
XI. LAND USE AND PLANNING
There are no significant impacts to Land Use Planning.
XII. MINERAL RESOURCES
There are no significant impacts to Mineral Resources.
XIII. NOISE
There are no significant impacts to Noise.
XIV. POPULATION AND HOUSING
There are no significant impacts to Population and Housing.
XV. PUBLIC SERVICES
There are no significant impacts to Public Services.
XVI. RECREATION
There are no significant impacts to Recreation.
XVII. TRANSPORTATION
There are no significant impacts to Transportation.
XVIII. TRIBAL AND CULTURAL RESOURCES
Implementation of CUL-1 in the manner discussed in the Cultural Resources Section, above.
XIX. UTILITIES AND SERVICE SYSTEMS

There are no significant impacts to Utilities and Services Systems.
XX. WILDFIRE
There are no significant impacts to Wildfire.
XXI. MANDATORY FINDINGS OF SIGNIFICANCE
Implementation of Mitigation Measures BIO-1 through BIO-9, CUL-1 through CUL-2, ENG-1, and GEO-1, as discussed in the Sections above.

LESA - AGRICULTURAL CONVERSION STUDY

CITY OF FRESNO

VESTING TENTATIVE TRACT MAP NO. 6294 PROJECT

OCTOBER 2025

LESA - AGRICULTURAL CONVERSION STUDY

VESTING TENTATIVE TRACT MAP NO. 6294 PROJECT

Prepared for:

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October 2025

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Project #200124.03

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ACRONYMS AND ABBREVIATIONS

CEQA	California Environmental Quality Act
CRC	California Resources Corporation
DOC	California Department of Conservation
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
LCC	Land Capability Classification System
LE	Land Evaluation
LESA	Land Evaluation and Site Assessment
NRCS	Natural Resources Conservation Service
SA	Site Assessment
USDA	United States Department of Agriculture
WRCC	Western Regional Climate Center
ZOI	Zone of Influence

SECTION 1 - INTRODUCTION

1.1 - Purpose and Methods of Assessment

This Agricultural Land Evaluation and Site Assessment (LESA) and Agricultural Conversion Study prepared for the proposed Vesting Tentative Tract Map (TTM) No. 6294 (Project). For the purposes of this analysis, the study assesses the development of an approximately 30-acre parcel (APN: 505-060-07; Project site), resulting in the subdivision of 185 single-family dwelling units a park and associated entitlments. The Project site is located on the southeast corner of North Grantland Avenue and West Barstow Avenue in the City of Fresno. The Project is located in the northern portion of the West Area Neighborhoods Specific Plan (WANSP or Specific Plan) boundaries.

The subject property has a land use designation of Residential Medium Density (5.0-12 D.U./acre) within the West Area Neighborhoods Specific Plan (WANSP), is zoned RS-5 (Residential Single-Family, Medium Density) and historically has been used as a commercial orchard. The Project site is currently an open field. Lot sizes for the 187 single-family dwelling units range from 3,775 square feet to 10,797 square feet.

The surrounding areas are comprised of undeveloped land and the Herndon Canal to the north and east, rural residential and undeveloped land to the south and medium density residential to the west.

The Project site does not have the potential to impact forest land (as defined in Public Resource Code Section 12220 (g)) or timberland (as designed by Public Resource Code Section 4526). However, the Project does have the potential to impact agricultural resources. The California Agricultural Land Evaluation and Site Assessment (LESA) Model was prepared to determine if the conversion of Prime Farmland to a non-agricultural use would constitute a significant impact pursuant to the California Environmental Quality Act (CEQA) Statute and Guidelines.

1.1.1 - AGRICULTURAL RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, the LESA Model (1997) prepared by the California Department of Conservation (DOC), may be used as a tool to assess the significance of impacts on agricultural resources and farmland conversion. The information used to prepare the LESA Model was based on information obtained from the DOC's Farmland Mitigation and Monitoring Program (FMMP), the United States Department of Agriculture, the Natural Resources Conversation Service (NRCS), and Geographic Information System (GIS) tools.

The FMMP considers Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance collectively as Important Farmland. Based on the farmland mapping categories Table 1-1 depicts the acreages of each category within the City of Fresno. Table 1-2 depicts the acreages of land designation per the FFMP, including Important Farmland within the Project site.

Table 1-1
Existing Farmland Acreages Within the West Area Neighborhoods Specific Plan Area

Designation	Acreage
Prime Farmland	1.5
Farmland of Statewide Importance	153.9
Unique Farmland	854.13
Farmland of Local Importance	1,158.12
Urban and Built Up	3,228.24
Rural Residential / Vacant / Disturbed	1,643.23

Source: Recirculated Draft Environmental Impact Report for the West Area Neighborhoods Specific Plan

Table 1-2
Existing Farmland Acreages Within the Project site

Designation	Acreage
Farmland of Local Importance	30.3

Source: Department of Conservation FMMP

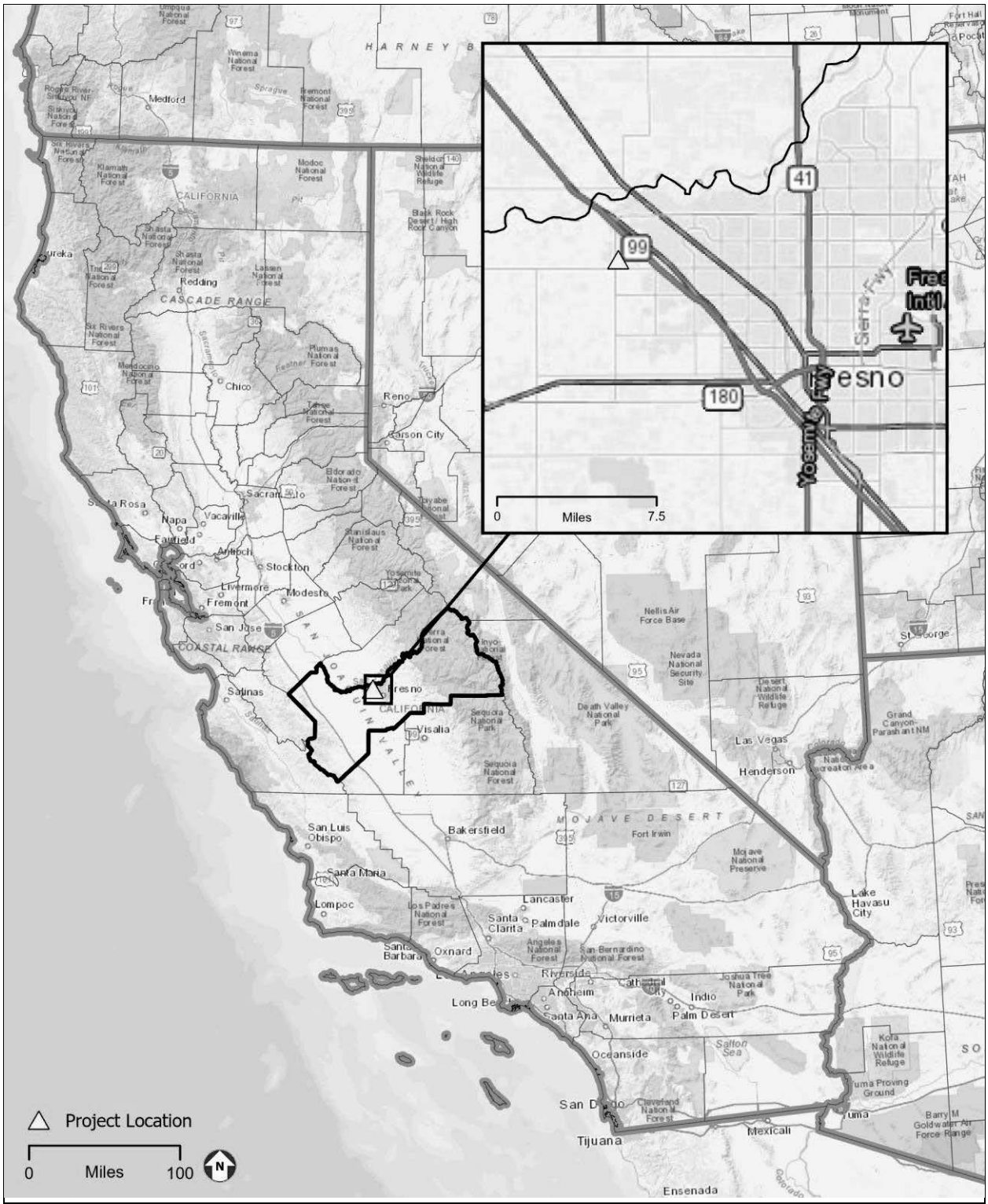


Figure 1-1
Regional Map



Figure 1-2
Project site

This study was prepared in the context of the California Environmental Quality Act (CEQA) (California Public Resources Code Sections 21000 et seq.) using the LESA Model.

1.2 - Project Description

1.2.1 - LOCATION

The Project site is located in the central region of Fresno County (Figure 1-1). The Project location is shown in Figure 1-2 and labeled as "Project site". The topography of the Project site is relatively flat and currently an open field. Figure 4 shows the topography of the site, which is relatively flat.

1.2.2 - PROJECT CHARACTERISTICS

This study is prepared for the development of a 185-unit single-family residential subdivision. The Project also includes on- and off-site improvements including external city circulation roads, interior local streets, curbs, gutters, storm drains, sidewalks, pedestrian walking trail for future connection, open space, landscaping, lighting and retaining walls, all of which will be developed to City standards by the Project developer.

The Project will connect to existing City of Fresno water and sewer service systems. All residential units will be equipped with 410-watt solar panels, utilize all electric appliances and will be EV-ready (pre-wired during construction to allow for installation of EV residential charger in the future).

The Specific Plan land use designation of the Project site is Residential Medium Density (5.0-12 D.U./acre) and zoned RS-5 (single-family medium density), as shown in Figure 1-4. The Project includes a request for approval of a Vesting Tentative Tract Map.

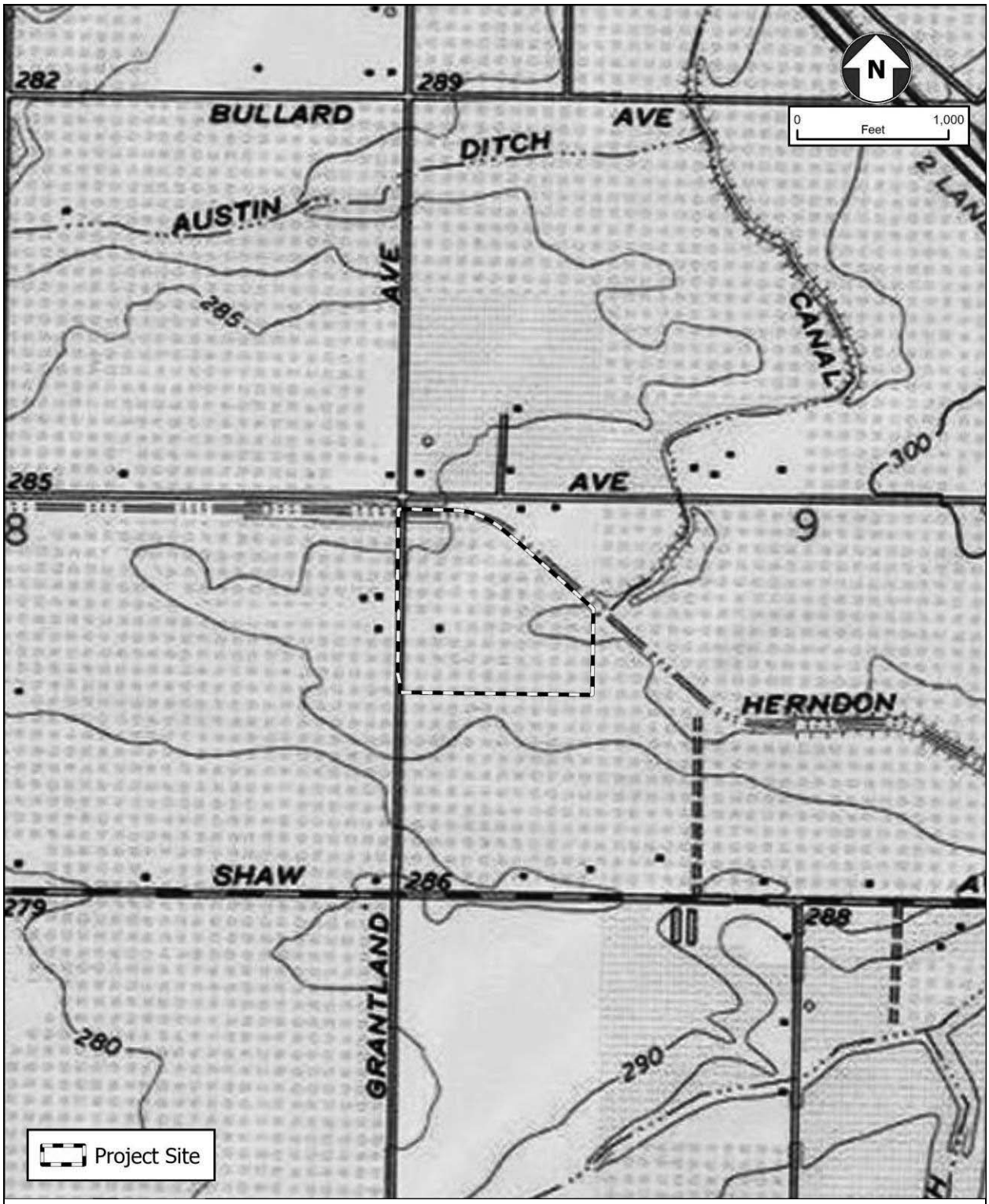


Figure 1-3
Topographic Map

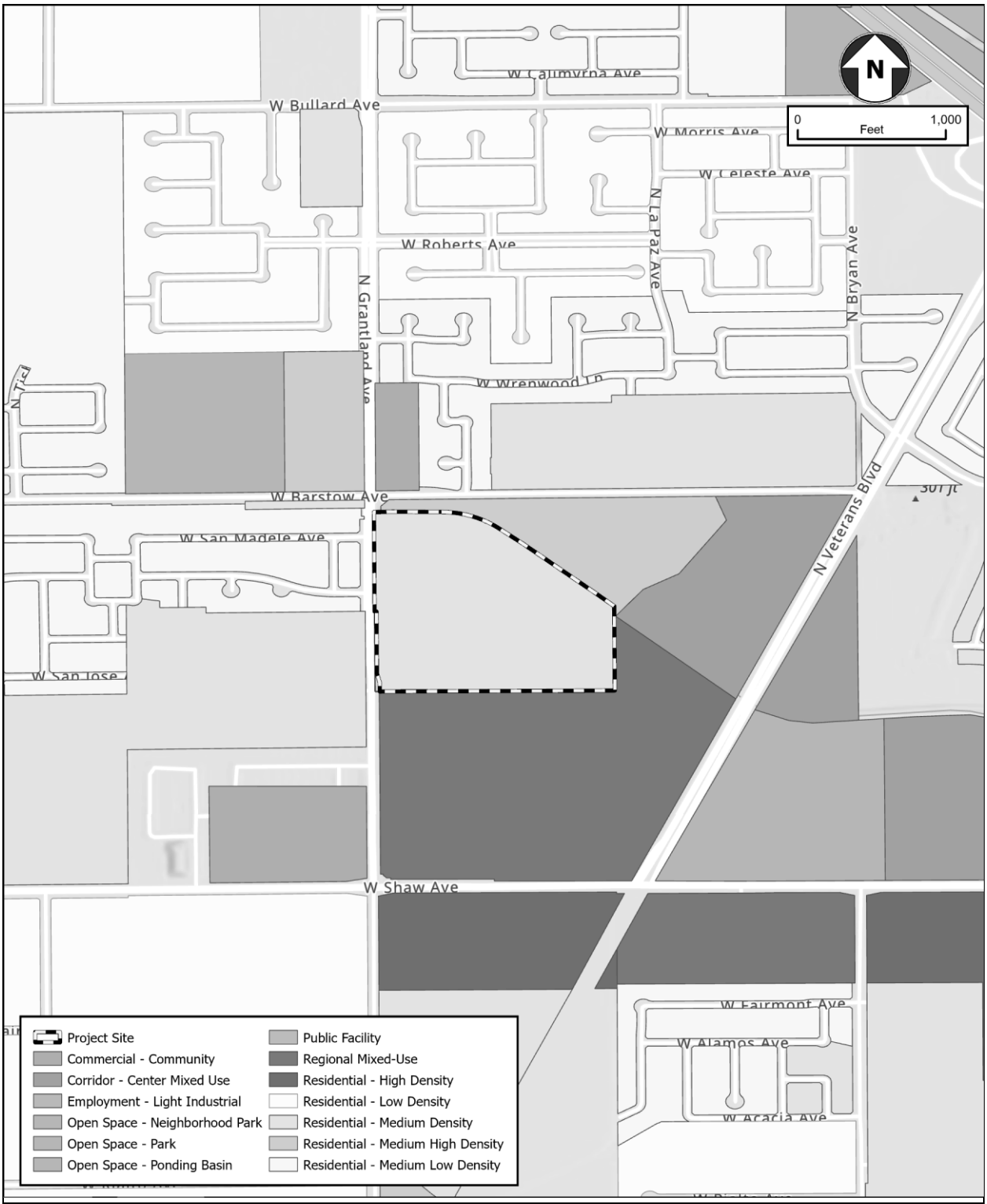


Figure 1-4
Specific Plan Land Use Designation

SECTION 2 - REGULATORY SETTING

This section describes the regulatory setting related to agricultural resources in the Project site.

2.1 - Federal

2.1.1 - FARMLAND PROTECTION POLICY ACT (7 USC 4201)

The purpose of the Farmland Protection Policy Act (FPPA) is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. It additionally directs federal programs to be compatible with State and local policies for the protection of farmlands. Congress passed the Agriculture and Food Act of 1981 (Public Law 97–98) containing the FPPA—Subtitle I of Title XV, Sections 1539–1549. The final rules and regulations were published in the Federal Register on June 17, 1994.

The FPPA is administered by the United States Department of Agriculture (USDA) and is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It assures that, to the extent possible, federal programs are administered to be compatible with State, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years. The FPPA does not authorize the federal government to regulate the use of private or non-federal land or, in any way, affect the property rights of owners.

For the purpose of FPPA, farmland includes Prime Farmland, Unique Farmland, and Land of Statewide or Local Importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, crop land, or other lands, but not water or urban built-up land. The USDA provides mapping services and data online as the single authoritative source of soil survey information.

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by a federal agency or with assistance from a federal agency (California Department of Conservation 2011).

2.2 - State of California

2.2.1 - CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF LAND RESOURCE PROTECTION

The DOC applies the NRCS soil classifications to identify agricultural lands. Pursuant to the FMMP, these designated agricultural lands are included in the Important Farmland Maps used in planning for the present and future of California's agricultural land resources. The FMMP was established in 1982 to assess the location, quality, and quantity of agricultural

lands and the conversion of these lands. The FMMP provides an analysis of agricultural land use and land use changes throughout California. The DOC has a minimum mapping unit of 10 acres, with parcels that are smaller than 10 acres being absorbed into the surrounding classifications.

The list below provides a description of all the categories mapped by the DOC. Collectively, lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are referred to as Farmland (California Department of Conservation 2004).

Prime Farmland. Farmland that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance. Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Unique Farmland. Farmland of lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

Farmland of Local Importance. Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

Grazing Land. Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

Urban and Built-up Land. Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

Other Land. Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and non-

agricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

2.2.2 - CALIFORNIA LAND CONSERVATION (WILLIAMSON ACT)

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is promulgated in California Government Code Sections 51200–51297.4, and therefore is applicable only to specific land parcels within the State of California. The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses in return for reduced property tax assessments. Private land within locally designated agricultural preserve areas is eligible for enrollment under Williamson Act land use contracts. However, an agricultural preserve must consist of no less than 100 acres. In order to meet this requirement, two or more parcels may be combined if they are contiguous, or if they are in common ownership (California Department of Conservation 2011).

The Williamson Act program is administered by the DOC, in conjunction with local governments, which administer the individual contract arrangements with landowners. The landowner commits the parcel to a 10-year period wherein no conversion out of agricultural use is permitted. Each year the contract automatically renews unless a notice of non-renewal or cancellation is filed. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. An application for immediate cancellation can also be requested by the landowner, provided that the proposed immediate cancellation application is consistent with the cancellation criteria stated in the California Land Conservation Act and those adopted by the affected county or city. Non-renewal or immediate cancellation does not change the zoning of the property. Participation in the Williamson Act program is dependent on county adoption and implementation of the program and is voluntary for landowners.

As defined by the Williamson Act, prime agricultural land includes: (1) Class I and II soils as classified by the NRCS; (2) land that qualifies for rating 80 through 100 in the Storie Index Rating by the University of California, Division of Agricultural Sciences; (3) land that supports livestock used for the production of food and fiber and with at least one animal unit per acre; (4) land planted with fruit or nut-bearing crops that yield not less than $200 per acre annually during commercial bearing periods; or (5) land that has returned from the production of unprocessed agricultural plant products and annual gross value of not less than $200 per acre for three of the previous five years (Government Code, Section 51201(c)(1)-(5)).

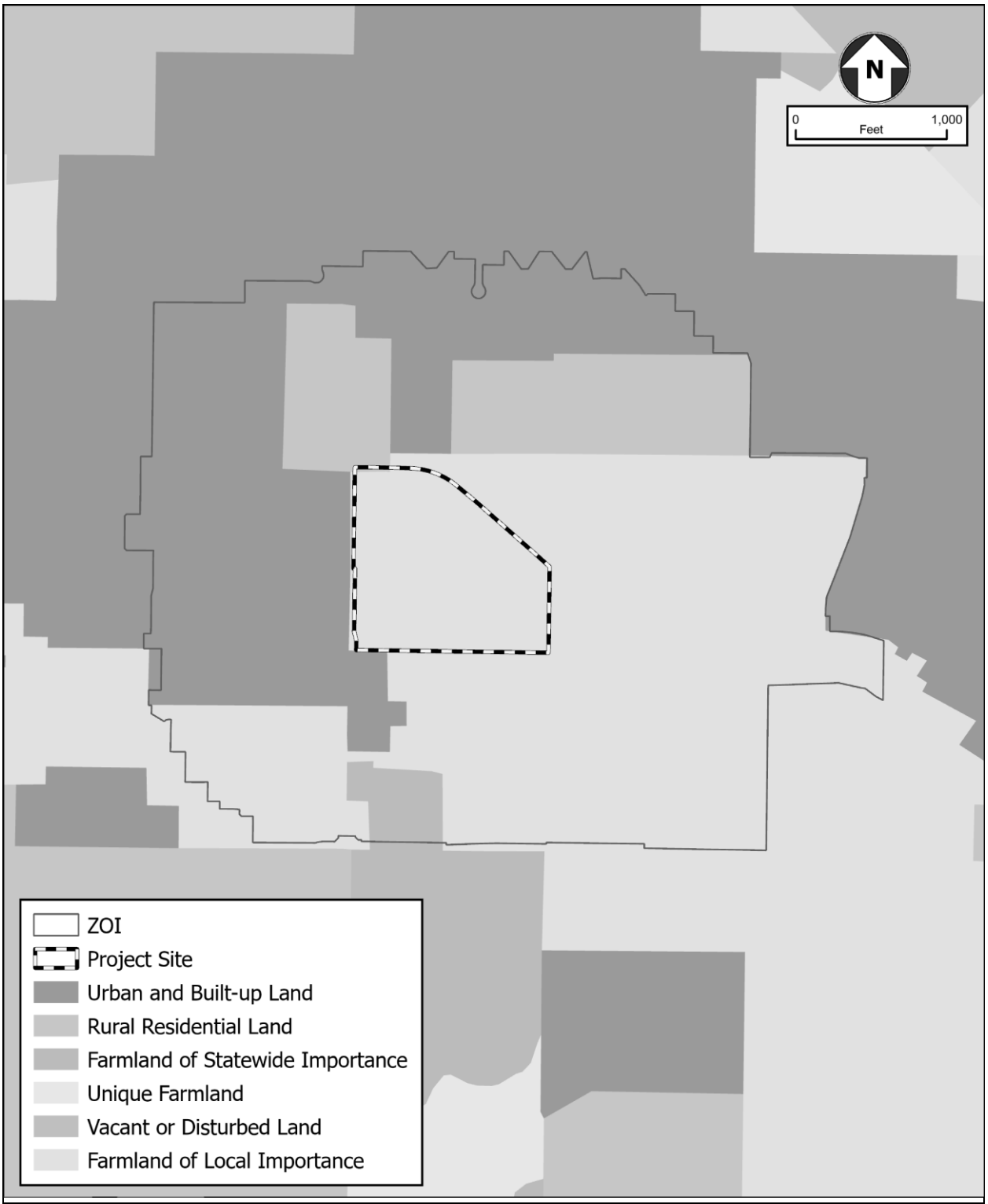


Figure 2-1
FMMP

2.2.3 - FARMLAND SECURITY ZONE ACT

The Farmland Security Zone Act is similar to the Williamson Act and was passed by the California State Legislature in 1999 to ensure that long-term farmland preservation is part of public policy. Farmland Security Zone Act contracts are sometimes referred to as "Super Williamson Act contracts." Under the provisions of this act, a landowner already under a Williamson Act contract can apply for Farmland Security Zone status by entering into a contract with the county. Farmland Security Zone classification automatically renews each year for an additional 20 years. In return for a further 35 percent reduction in the taxable value of land and growing improvements (in addition to Williamson Act tax benefits), the owner of the property promises not to develop the property into non-agricultural uses.

2.2.4 - PUBLIC RESOURCES CODE SECTION 21060.1

The Public Resource Code Section 21060.1 defines agricultural land for the purposes of assessing environmental impacts pursuant to CEQA using the FMMP. The FMMP was established in 1982 to assess the location, quality, and quantity of agricultural lands and the conversion of these lands. The FMMP provides an analysis of agricultural land use and land use changes throughout California.

2.3 - Local Regulations

The subject property has a land use designation of Residential Medium Density (5.0-12 D.U./acre) within the West Area Neighborhoods Specific Plan (WANSP) and is zoned RS-5 (Single-Family Medium Density). The Specific Plan is consistent with policies in the City of Fresno General Plan. These adopted plans identify the types of land uses permitted in a variety of land use designations and zone districts and define the development parameters within each land use category. The Project must adhere to applicable mitigation measures in the Specific Plan, as well as the City of Fresno Zoning Ordinance and any other applicable regulations pertaining to development.

2.3.1 - WEST AREA NEIGHBORHOODS SPECIFIC PLAN

The purpose of the Specific Plan is to encourage the orderly and balanced development in a rapidly growing region in the western portion of the City, located west of State Route 99. The Plan seeks to develop infrastructure, amenities, and public facilities that enhance the quality of life, and implement this charge in a manner that respects the long-standing businesses and residents of the West Area (City of Fresno Planning and Development Department 2025a).

The applicable goal, policy and mitigation measures to the Project related to agricultural resources are provided below:

Goal

LUH Goal 5 Provide for urban edge transitions that respect existing rural residential and agricultural uses.

Policy

LUH 5.2 Support efforts to create a Farmland Preservation Program. The Program shall consider methods to prevent the premature loss of the State's Important Farmland, including, but not limited to, incorporation of agrihoods, 1:1 or greater conservation easements, or other potential methods.

Mitigation Measure

MM 3.2-1 Prior to initiation of grading activities, project proponents shall compensate for the loss of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland within the Plan Area by preserving an equivalent type and quality of land at a 1:1 ratio through recordation of a conservation easement, or other recorded instrument such as a covenant or deed that restricts the preserved land in perpetuity to agricultural uses. The acreage and type of land used to compensate for the loss of farmland shall be determined using the Land Evaluation and Site Assessment (LESA) Model. The LESA Model evaluates measures of soil resource quality, a given product's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. In the alternative, if the City adopts a Farmland Preservation Program pursuant to Fresno General Plan Policy RC-9-c, project proponents may compensate for the loss of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland by complying with the adopted Farmland Preservation Program.

2.3.2 - CITY OF FRESNO GENERAL PLAN

The objective and implementing policy in the City of Fresno General Plan relating to agricultural resources that are applicable to the Project is provided below (City of Fresno Development and Resource Management Department 2014):

Objective

RC-9 Preserve agricultural land outside of the area planned for urbanization under this General Plan.

Policy

RC-9-c Farmland Preservation Program. In coordination with regional partners or independently, establish a Farmland Preservation Program. When Prime Farmland, Unique Farmland, or Farmland of Statewide Importance is converted to urban uses outside City limits, this program would require that the developer of such a project mitigate the loss of such farmland consistent with the requirements of CEQA. The Farmland Preservation Program shall provide several mitigation options that may include, but are not limited to the following: Restrictive Covenants or Deeds, In Lieu Fees, Mitigation Banks, Fee

Title Acquisition, Conservation Easements, Land Use Regulations, or any other mitigation method that is in compliance with the requirements of CEQA. The Farmland Preservation Program may be modeled after some of all of the programs described by the California Council of Land Trusts.

2.3.3 - CITY OF FRESNO ZONING ORDINANCE

The City of Fresno Zoning Ordinance establishes the basic regulations under which land is developed. This includes allowable uses, building setback requirements, and development standards. Pursuant to State law, the Zoning Ordinance must be consistent with the Fresno General Plan. The basic intent of the City of Fresno Zoning Ordinance is to promote and protect the public health, safety, and welfare via the orderly regulation of land uses throughout the City. This zoning code applies to all property in the City.

Zoning Districts

(RS-5) MEDIUM LOW DENSITY RESIDENTIAL ZONE DISTRICT

The purpose of the RS-5 zone district is to designate areas that will provide for a variety of single-family residences built to urban or suburban standards to be suitable for traditional smaller lot, single-family homes and compatible uses.

SECTION 3 - ENVIRONMENTAL SETTING

3.1 - State of California

3.1.1 - STATE OF CALIFORNIA AGRICULTURAL PRODUCTION

In 2023, the State of California contained 23.8 million acres of land that were dedicated to farm and ranch use, with 62,900 farms in operation at the time (California Department of Food and Agriculture 2024). The average farm size was 378 acres in 2023, down from 384 acres in 2022 and below the 2023 national average farm size of 464 acres.

With a $59.4 billion in cash receipts for 2023, California was the leading state in cash farm receipts, with combined commodities representing 11.3 percent of the U.S. total. California's leading crops remained fruits, nuts and vegetables.

3.1.2 - STATE OF CALIFORNIA FARMLAND CONVERSION

According to the DOC's most recent Farmland Conversion Report (2016–2018), irrigated farmland in California decreased 56,186 acres between 2016 and 2018 (California Department of Conservation 2023). Irrigated farmland was the source of 30 percent of all new urban and built-up land. Specifically, Prime Farmland contributed to 12 percent of urban land. Land was removed from irrigated categories—to uses aside from urban—at a rate 19 percent higher than compared with the prior update (128,105 acres in 2016, and 152,627 acres in 2018). Land idling and reversion to dry farming were responsible for the majority of this type of conversion. The San Joaquin Valley and Sacramento Valley were most impacted by land idling roughly accounting for 60,329 acres and 18,812 acres of irrigated lands being converted due to the cessation of irrigation, respectively.

3.2 - Fresno County

3.2.1 - FRESNO COUNTY AGRICULTURAL PRODUCTION

Agriculture in Fresno County makes a significant contribution to the economy of the State (Fresno County Department of Agriculture and Measurement Standards 2023). Fresno County has continued to increase agricultural production as crop value increased from $8.09 billion in 2022 to $8.59 billion in 2023. This represents a 6.1% increase over the previous year's total. Since 2004 there has been an upward trend in total growth of value; nearly doubling in gross value.

Table 3-1
Fresno County Agricultural Economy (2022–2023)

Year	$ Value (Billions)
2022	8,095,546,000
2023	8,589,054,000

Source: (Fresno County Department of Agriculture and Measurement Standards 2023)

The 2023 Fresno County Agricultural Crop Report indicated the gross value of all agricultural commodities produced in Fresno County is $8,589,054,000. A detail by crop of the economic value of Fresno County's crops which contributed to Fresno County's economic outcomes is listed in Table 3-2.

Table 3-2
Fresno County Crop Economic Value (2022–2023)

Category	2022	2023	Total Change
Fruit & Nut Crops	$4,522,032,000	$4,756,015,000	$233,983,000
Seed Crops	$28,406,000	$46,093,000	$17,687,000
Field Crops & Rangeland	$373,438,000	$346,933,000	($26,505,000)
Vegetable Crops	$1,240,819,000	$1,537,762,000	$296,943,000
Nursery Crops	$50,213,000	$58,067,000	$7,854,000
Industrial & Wood Crops	$1,940,000	$1,739,000	($201,000)
Livestock & Poultry	$1,058,256,000	$1,144,381,000	$86,125,000
Livestock & Poultry Products	$669,449,000	$547,129,000	($122,320,000)
Apiary products	$150,993,000	$150,935,000	($58,000)
Total Economic Value	**$8,095,546,000**	**$8,589,054,000**	**$493,508,000**

Source: (Fresno County Department of Agriculture and Measurement Standards 2023)

According to the 2023 Agricultural Crop Report prepared by the Fresno County Agricultural Commissioner's Office, the County produces more than 114 different crops, including more than 20 types of fruits and nuts, 30 types of vegetables, and 20 field crops, as well as timber, nursery stock, livestock, poultry, and dairy products. A detail by crop of the harvested and rangeland acreage that contributed to Fresno County's economic outcomes is listed in Table 3-3.

Table 3-3
Fresno County Harvested Crops (2022–2023) in Acres

Category	2022	2023	Total Change
Fruit & Nut Crops	754,410	773,780	19,370
Seed Crops	4,490	6,990	2,500
Field Crops & Rangeland	1,036,440	1,106,300	69,860
Vegetable Crops	143,440	154,970	11,530
Total Harvest Acreage	1,938,780	2,042,040	103,260

Source: (Fresno County Department of Agriculture and Measurement Standards 2023)

3.2.2 - FRESNO COUNTY FARMLAND CONVERSION

According to the DOC's California Land Conservation (Williamson) Act most recent Status Report, from 2020 to 2022, there was a net decrease of 4,396 acres in Important Farmland in Fresno County (California Department of Conservation 2023). The conversion of agricultural land to urban uses is affected by other economic factors, such as the economic benefits property owners sometimes realize by converting their farmland to urban or other commercial or industrial uses.

Table 3-4 provides a summary of the amount and type of total acreage in Fresno County between 2020 to 2022, using the classifications of agricultural land provided by the FMMP. See also Figure 3-1, below.

Table 3-4
Fresno County Important Farmland Summary (2020–2022)

	Acres		
Classification	**2020**	**2022**	**Net Change**
Prime Farmland	663,706	658,146	(5,560)
Farmland of Statewide Importance	385,285	380,125	(5,160)
Unique Farmland	95,047	94,215	(832)
Farmland of Local Importance	202,159	210,579	8,420
Important Farmland Total	1,346,197	1,343,065	(3,132)
Total County Area Inventoried	2,437,435	2,437,435	0

Source: (California Department of Conservation 2023)

3.3 - Project

The Project site is comprised of disturbed land previously used for a commercial orchard that is now an open field. Fresno Irrigation District (FID) owns and operates Canal No 39 (Herndon Canal), which bisects the Project site and supplies water to the site (Fresno Irrigation District 2018).

The Project site and the surrounding properties within the Zone of Influence (ZOI) are not subject to a Williamson Act Land Use contract (Figure 3-3). As identified by the FMMP, the site is identified as having Farmland of Local Importance for the entire parcel (Figure 2-1).

3.3.1 - AGRICULTURAL CROPS—PROJECT SITE

The approximately 30-acre Project site has not been used in agricultural production within the last three reportable years (2020-2022). According to aerial imagery, the Project site may have been out of active production since as early as 2009. The California Department of Water Resources maintains data on the crop type for each parcel cultivating agriculture. Figure 3-1 shows the location of commodities grown based on information available from permits issued by the California Department of Water Resources. For the past three recorded years (2020 – 2022), the Project site has been an open field.

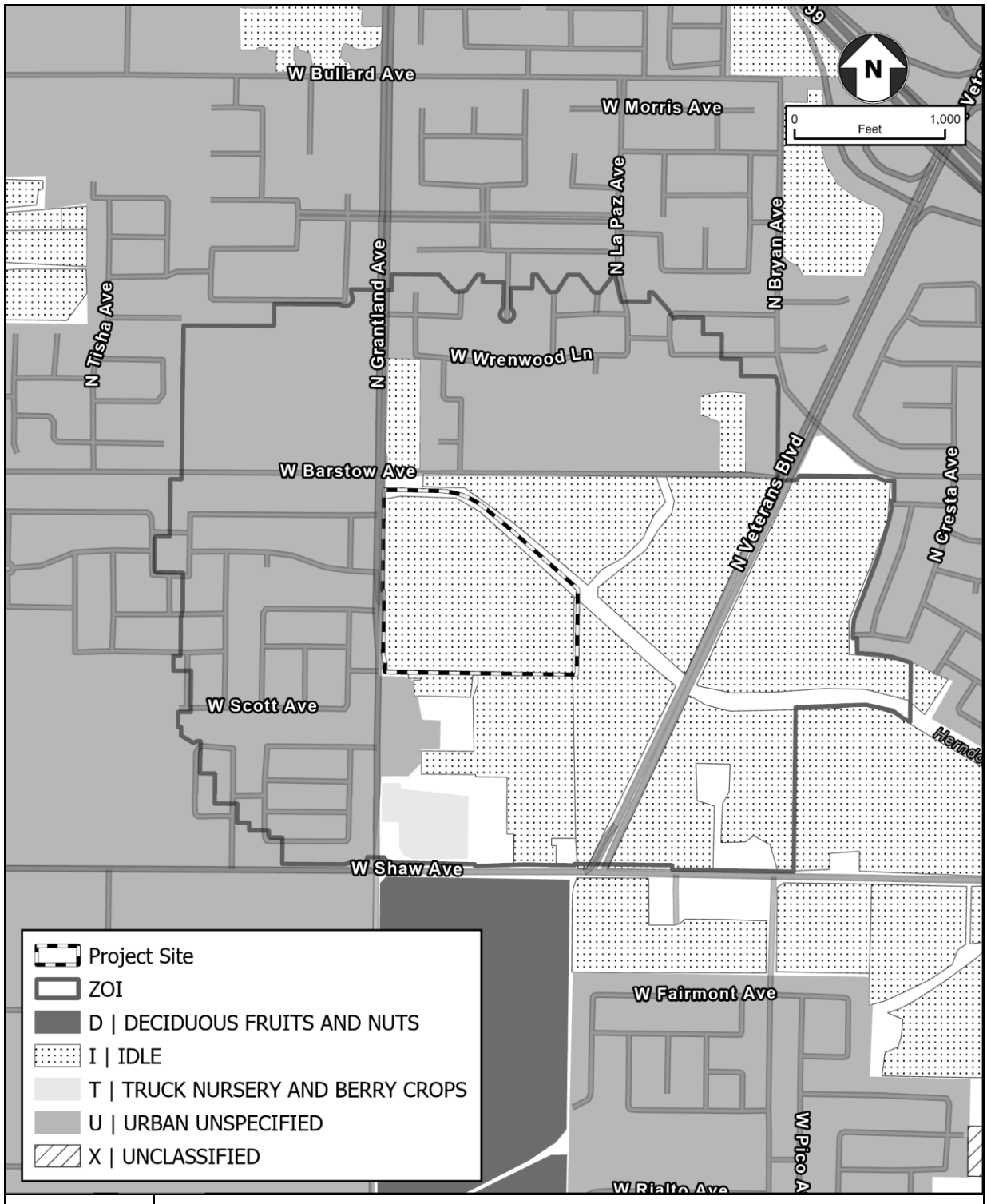


Figure 3-1
Crop Permit Issuance Map

As shown in Figure 3-3, the Williamson Act Map refers to areas in the map as "Prime" farmland. Prime has two meanings in California. The FMMP determines the location and extent of "Prime Farmland." The parameters used are if the property has been used for irrigated agricultural production at some time during the four years prior to the Important Farmland Map data. In addition to land use, the soil must meet the physical and chemical criteria for Prime Farmland or Farmland of Statewide Importance as determined by the USDA NRCS. NRCS soil factors include water moisture regimes, available water capacity, developed irrigation water supply, soil temperature range, acid-alkali balance, water table, soil sodium content, flooding (uncontrolled runoff from natural precipitation), erodibility, permeability rate, rock fragment content, and soil rooting depth. The Project site is not subject to a Williamson Act land use contract nor is it designated as Prime, Unique or Farmland of Statewide Importance.

3.3.2 - SOILS – PROJECT SITE

As shown in Figure 3-2, the Project site contains primarily San Joaquin sandy Loam soil type. Each soil type's class with and without irrigation is denoted in Table 3-5.

Table 3-5
Project site Soil Classes

Soil Map Unit	Soil Type	Capability Class with Irrigation	Capability Class without Irrigation
ScA	San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17	IVs	IVs

Source: (United States Department of Agriculture (USDA) 2023)

(ScA) San Joaquin sandy loam: The San Joaquin series consists of moderately deep, well and moderately well-drained soils on flood plains and recent alluvial fans. These soils are formed in alluvium derived dominantly from mixed granitic rock sources. The slope is zero to nine percent. The mean annual precipitation is about 15 inches, and the mean annual temperature is about 61°F.

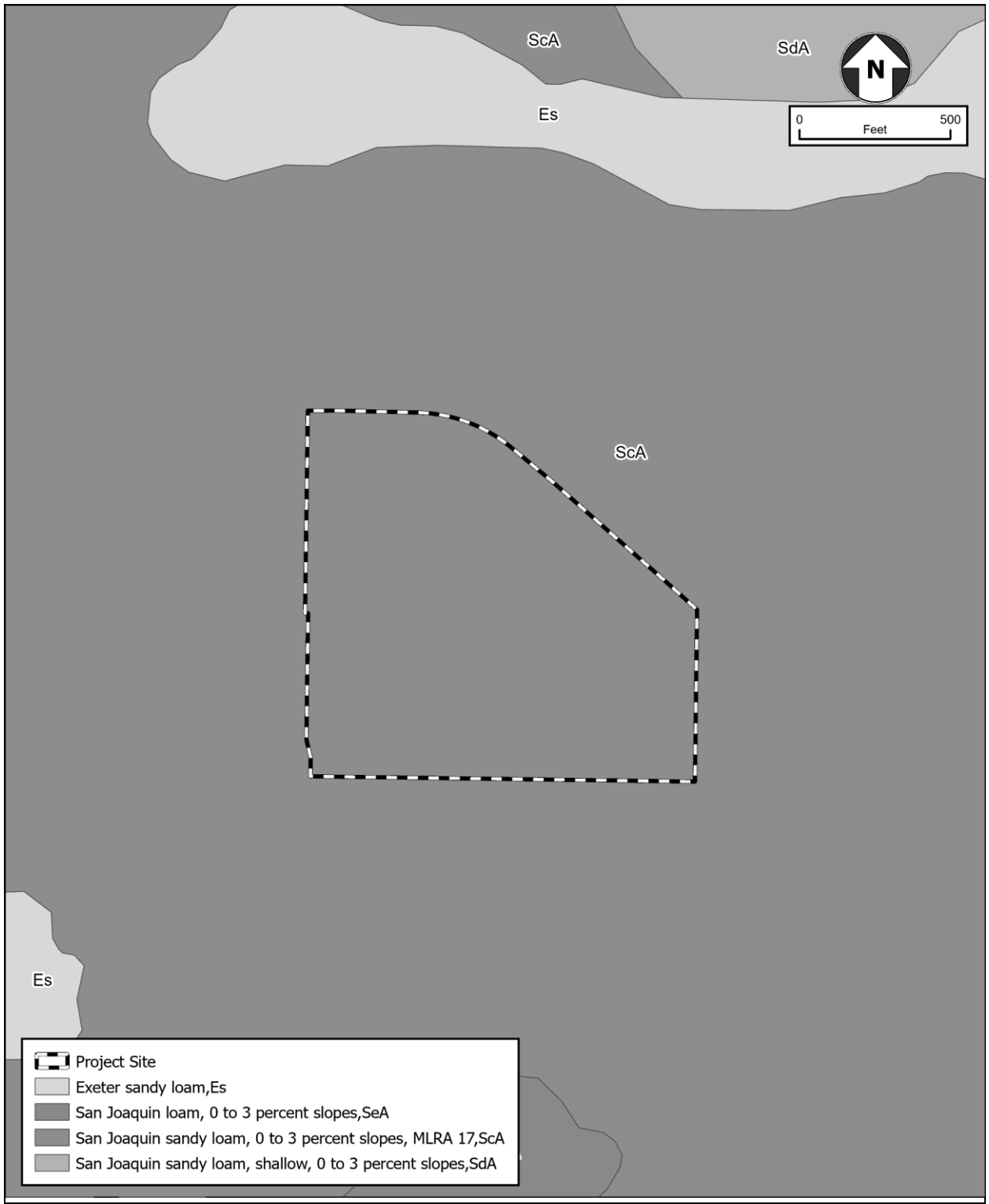


Figure 3-2
Soil Information Map

3.3.3 - WILLIAMSON ACT CONTRACTS—PROJECT SITE AND SURROUNDING AREA

As mentioned in Section 1.2, the Project site consists of a singular parcel of approximately 30 acres. According to the DOC, the Project site parcel is not subject to a Williamson Act Land Use Contract.

There are 559 parcels located inside the ZOI (Figure 3-3). There are no Williamson Act Contracts within the ZOI. The ZOI is defined as land near a given project, both directly adjoining and within a defined distance away, which is likely to influence and be influenced by the agricultural land use of the subject Project site. The concept of ZOI and its significance will be discussed in further detail in the analysis portion of this study.



Figure 3-3
Williamson Act Map

3.3.4 - WATER—PROJECT SITE

The previous commercial orchard obtained water for the irrigation of crops either through private groundwater wells or contract surface water agreements with the local water district. The Project site is located within the Tulare Lake Hydrologic Region, the San Joaquin Valley Groundwater Basin and the Kings Subbasin (QK 2025). The California Department of Water Resources, (DWR) has divided the State into 10 Hydrologic Regions. The Project site is located within the Tulare Lake Hydrologic Region in a Basin ranked as "high priority" in a statewide ranking of groundwater importance. Surface water is now a primary water supply used to meet potable demands within the City. The City contracts with FID (Fresno Irrigation District) for Kings River water and with the USBR (United States Bureau of Reclamation) for CVP (Central Valley Project) water from the Friant-Kern Canal. The surface water supply is used either for potable uses through treatment and distribution or delivery to recharge basins for groundwater recharge.

As mentioned in Section 3.3.1, the Project site was historically used as a commercial orchard, but more recently the trees have been removed by the property owner and is now an open field.

3.3.5 - CLIMATE—PROJECT SITE

The Project site is located in the southern Central Valley of California; this area has the rainy winters and dry summers characteristic of a Mediterranean climate. The Central Valley has greater temperature extremes than the coastal areas because it is less affected by the moderating influence of the Pacific Ocean.

The Western Regional Climate Center (WRCC) provides quality climate data derived from stationary weather stations throughout the western United States. WRCC has developed a data set for the monthly climate for the Fresno area (1948 to 2016); this data set is based on weather readings taken from a stationary weather station found at the Fresno Yosemite International Airport (Western Regional Climate Center 2017). The monthly average maximum was 98.3°F in July and the monthly average minimum was 37.6°F in January.

Typical of Central California, most of the rainfall in the Fresno area occurs during the period between November and April because the Gulf Stream shifts southward from northern latitudes in the wintertime. This shift creates a quasi-permanent low-pressure zone over Central California and feeds moisture originating over the Pacific Ocean into the region. This southern shift creates the winter-wet or Mediterranean climate characteristic of Southern California. However, because of its inland location and the rain shadow effect (reduction of precipitation commonly found on the leeward side of a mountain caused by the Coastal Mountain Ranges), the Fresno area typically gets less rainfall during the winter than coastal areas to the west. The average annual precipitation in the Fresno area is 10.95 inches (US Climate Data 2024).

SECTION 4 - FARMLAND CONVERSION IMPACT ANALYSIS

This section evaluates the impacts of farmland conversion with respect to the factors identified by City of Fresno and the California LESA Model.

4.1 - Methodology

This study follows the guidelines prescribed by the California LESA Model to assess the proposed Project's potential impact to agricultural lands. As previously mentioned, the Project proposes to develop single family homes consistent with the West Area Neighborhoods Specific Plan. The Specific Plan identifies that development would result in the conversion of Important Farmland to non-agricultural uses. The Project site is identified as Farmland of Local Importance. Farmland of Local Importance is land of importance to the local agricultural economy, as determined by each county's Board of Supervisors and a local advisory committee. The Specific Plan identifies Prime Farmland, Farmland of Statewide Importance (Statewide Farmland), Unique Farmland and Farmland of Local Importance (Local Farmland) as Important Farmland.

However, the Project is not subject to a Williamson Act land use contract. As noted, the Project is within the Plan Area of the West Area Neighborhoods Specific Plan. The Project is consistent with goals, policies and mitigation measures related to agricultural land conversions outlined in the Specific Plan (Goal LUH 5, Policy LUH 5.2 and MM 3.2-1) because the Project site is not within Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. Therefore, this analysis will assess the significance of project-specific impacts to agricultural resources associated with the development of the Project site.

4.1.1 - LAND EVALUATION AND SITE ASSESSMENT (LESA)

The LESA Model provides guidelines for rating the relative quality of land resources based on specific measurable features. It is intended "to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process" (Public Resources Code Section 21095). It is designed to assist in the making of determinations of the potential significance of a project's conversion of agricultural lands.

The California Agricultural LESA Model encompasses six different factors, which are divided into two sets: (1) two land evaluation factors (Land Capability Classification Rating and Storie Index Rating are based on measures of the quality of soil resources and are intended to measure the inherent, soil-based qualities of land as they relate to agricultural suitability; and (2) four site assessment factors (Project Size Rating, Water Resource Availability Rating, Surrounding Agricultural Lands Rating, and Surrounding Protected Resource Lands Rating) are intended to measure social, economic, and geographic attributes that also contribute to the overall value of agricultural land.

The two sets of factors are evenly weighted, meaning the two land evaluation factors and four site assessment factors are of equal importance. However, for a given project, each of these six factors is separately rated on a 100-point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. This final project score provides a quantitative measurement to assist decision-makers in making a determination of the level of significance of a project's potential impacts.

The California LESA Model includes two land evaluation factors, the Land Capability Classification Rating and the Storie Index Rating, discussed below, that are separately rated.

Land Evaluation (LE) Factors

The California LESA Model includes two land evaluation factors, discussed below, that are separately rated.

THE LAND CAPABILITY CLASSIFICATION RATING (LCC)

The Land Capability Classification System is used by the USDA, NRCS to determine a soil's agricultural productivity. The LCC indicates the suitability of soils for most kinds of crops. Groupings are made according to the limitations of the soils when used to grow crops and the risk of damage to soils when used in agriculture. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. Soils are rated from Class I to Class VIII, with soils having the fewest limitations receiving the highest rating (Class I). The "prime" soil classification indicates the absence of soil limitations, which if present, would require the application of management techniques (e.g., drainage, leeching, special fertilizing practices) to enhance production. Specific subclasses are also utilized to further characterize soils. Soil types found in the Project site are illustrated in Figure 3-2. A general description of soil classifications, as defined by NRCS, along with the scoring within the LESA Model of the LCC classification is provided below in Table 4-1 and Table 4-2, respectively.

Table 4-1
Land Capability Classifications

Soil Class	Description
I	Soils have few limitations that restrict their use.
II	Soils have moderate limitations that reduce the choice of plants, or that require special conservation practices.
III	Soils have severe limitations that reduce the choice of plants, require conservation practices, or both.
IV	Soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
V	Soils are not likely to erode but have other limitations; impractical to remove soils that limit their use largely to pastures or range, woodland, or wildlife habitat.
VI	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, or range, woodland, or wildlife habitat.
VII	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland or wildlife habitat.
VIII	Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife habitat, or water supply, or to aesthetic purposes.

Source: (USDA 2021)

Table 4-2
Land Capability Classifications

Classification Symbol	Rating
I	100
IIe	90
IIs, w	80
IIIe	70
IIIs, w	60
IVe	50
IVs, w	40
V	30
VI	20
VII	10
VIII	0

The LESA Model scores LLC utilizing a specified method based on the proportion of the site within that classification. The percentage of the site within each LLC classification is multiplied by the corresponding score designation and then added together to give an overall score of the Project. The LCC score of each soil type is shown in Table 4-3.

Table 4-3
Project site – LLC Rating and Storie Rating Proportional Scores

Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
ScA	30.3	100%	IVs	40	40	24	24
Total Acres	**30.3**	**1**		**LCC Total**	**40.0**	**Storie Total**	**24.0**

Based on the weighted percentage of the total Project acreage, the comprehensive LCC Rating score is 40.0.

THE STORIE INDEX RATING

The Storie Index provides a numeric rating (based on a zero to 100 scale) of the relative degree of suitability or value of a given soil for intensive agriculture. The rating is based on soil characteristics only. Four factors that represent the inherent characteristics and qualities of the soil are considered in the Storie Index Rating: profile characteristics, texture of the surface layer, slope, and other factors such as drainage or salinity. In some situations, only the United States Department of Agriculture's LCC information may be available. In situations where other information is available, the Storie Index Ratings can be calculated from information contained in soil surveys conducted by qualified soil scientists; however, if limitations of time and/or resources restrict the derivation of the Storie Index Rating using these methods, the Storie Index Rating may be obtained by relying solely upon the LCC Rating. In addition, the USDA, Natural Resources Conservation Services provides a useful online mapping tool that provides soil information and data which includes the Storie Index Rating for approximately 95 percent of all U.S. sites. A score ranging from 0 to 100 percent is determined for each factor, and the scores are then multiplied together to derive a Storie Index Rating. Storie Index Ratings have been combined into six grade classes as follows: Grade 1 (excellent), 100 to 80; Grade 2 (good), 79 to 60; Grade 3 (fair), 59 to 40; Grade 4 (poor), 30 to 20; Grade 5 (very poor), 19 to 10; and Grade 6 (non-agricultural), less than 10. The Project's soil type was previously described in Section 3.3.2 of this study. Table 4-3 shows the proportional breakdown and comprehensive score of the Project site as it relates to the overall Storie Rating.

Based on the weighted percentage of the total Project acreage, the comprehensive Stories Rating score is 24.0.

Site Assessment (SA) Factors

The four site assessment factors that are separately rated and included in the California LESA Model are discussed below.

THE PROJECT SIZE RATING

The Project Size Rating is based on identifying acreage totals for the soil classes derived from the Storie Index within the Project site, and then determining what grouping generates the highest Project Size score and what percentage of each group of the total Project site. The Project Size Rating relies upon acreage figures that were tabulated under the Land Capability Classification Rating. The total Project consists of Class I, Class II, and Class III soils. The scoring of the Project Size is shown in Table 4-4.

Table 4-4
Project Size Scoring

Class I and II		Class III		Class IV or higher	
Acres	Score	Acres	Score	Acres	Score
>80	100	>160	100	>320	100
60-79	90	120-159	90	240-319	80
40-59	80	80-119	80	160-239	60
20-39	50	60-79	70	100-159	40
10-19	30	40-59	60	40-99	20
10<	0	20-39	30	40<	0
		10-19	10		
		10<	0		

It was determined that the Project site contains 30.3 acres of soil with an LCC classification of IV. Therefore, Class IV soils provided the Project with a high score of 0.

THE WATER RESOURCES AVAILABILITY RATING

The Water Resources Availability Rating is based on identifying the various water sources that may supply a given property, and then determining whether different restrictions in supply are likely to take place in years that are characterized as being periods of drought and non-drought. Consideration is also given to both the physical and economic factors that may restrict water availability. Please see Table 4-5 for a representation of the LESA Water Availability Scoring System.

Table 4-5
LESA Water Availability Scoring System

Option	Non-Drought Years Restrictions			Drought Years Restrictions			Water Resource Score
	Irrigated Production Feasible?	Physical Restrictions?	Economics Restrictions?	Irrigated Production Feasible?	Physical Restrictions?	Economics Restrictions?	
1	Yes	No	No	Yes	No	No	100
2	Yes	No	No	Yes	No	Yes	95

Option	Non-Drought Years Restrictions			Drought Years Restrictions			Water Resource Score
	Irrigated Production Feasible?	Physical Restrictions?	Economics Restrictions?	Irrigated Production Feasible?	Physical Restrictions?	Economics Restrictions?	
3	Yes	No	Yes	Yes	No	Yes	90
4	Yes	No	No	Yes	Yes	No	85
5	Yes	No	No	Yes	Yes	Yes	80
6	Yes	Yes	No	Yes	Yes	No	75
7	Yes	Yes	Yes	Yes	Yes	Yes	65
8	Yes	No	No	No			50
9	Yes	No	Yes	No			45
10	Yes	Yes	No	No			35
11	Yes	Yes	Yes	No			30
12	Irrigated production not feasible, but rainfall adequate for dryland production in both drought and non-drought years						25
13	Irrigated production not feasible, but rainfall adequate for dryland production in non-drought years (but not in drought years)						20
14	Neither irrigated nor dryland production feasible						0

During non-drought years, irrigated production of all parcels with active agricultural activities within the Project site is feasible without any economic or physical restrictions due to the surface water availability and onsite well, if necessary. During drought years, irrigated production may be limited only due to economic limitations due to limited surface water supplies, but this may be offset by increasing private groundwater usage from existing wells operated by the applicable water district in order to supply adequate water services. It is assumed that water is available to irrigate crops as needed on the active agricultural operation. Based on the available data and history of the Project site has been used for agricultural purposes and is assumed to have sufficient water during drought and non-drought years and there are no limitations or restrictions.

Therefore, based on this information, the Project's Water Resource Availability Rating is 100.

THE SURROUNDING AGRICULTURAL LAND RATING

Determination of the Surrounding Agricultural Land Rating is based on the identification of a project's ZOI, which is defined as that land near a given project, both directly adjoining and within a defined distance, that is likely to influence and be influenced by the agricultural land use of the subject project site. The Surrounding Agricultural Land Rating is designed to provide a measurement of the level of agricultural land use for lands close to a given project. The California Agricultural LESA Model rates the potential significance of the conversion of an agricultural parcel that has a large proportion of surrounding land in agricultural production more highly than one that has a relatively small percentage of surrounding land in agricultural production.

The defined distance of the ZOI recommended in the LESA Model (a minimum of 0.25 miles from the project boundary from the smallest rectangular area that completely encompasses the project area) is the result of several iterations during model development for assessing an area that will generally be a representative sample of surrounding land use. Figure 4-1, below shows the ZOI surrounding the entire Project site and the corresponding agricultural usage as documented by the California Department of Water Resources. The total area of the ZOI is approximately 328.95 acres and will be used for calculating the Surrounding Agricultural Land Ratings, as shown in Table 4-6.

Table 4-6
Surrounding Agricultural Land Rating Scoring

Percent of ZOI in Agriculture	Score
90-100%	100
80-89%	90
75-79%	80
70-74%	70
65-69%	60
60-64%	50
55-59%	40
50-54%	30
45-50%	20
40-44%	10
< 40%	0

According to data available from the California Department of Water Resources, there are 0 acres of agricultural land within the ZOI. Therefore, based on the surrounding agricultural activities and uses, the Project site's Surrounding Agricultural Land Ratings are 0.

THE SURROUNDING PROTECTED RESOURCE LAND RATING

The Surrounding Protected Resource Land Rating is essentially an extension of the Surrounding Agricultural Land Rating, and it is scored in a similar manner. Protected resource lands are those lands with long-term use restrictions that are compatible with or supportive of agricultural uses of land. Included among them are the following:

- Williamson Act contracted lands.
- Publicly owned lands maintained as a park, forest, or watershed resources.
- Lands with agricultural, wildlife habitat, open space, or other natural resource easements that restrict the conversion of such land to urban and industrial uses.

The total area of the ZOI is approximately 328.95 acres and will be used for calculating the Surrounding Agricultural Land Ratings, as shown in Table 4-7.

Table 4-7
Surrounding Protected Resource Land Rating Scoring

Percent of ZOI in Protected	Score
90-100%	100
80-89%	90
75-79%	80
70-74%	70
65-69%	60
60-64%	50
55-59%	40
50-54%	30
45-50%	20
40-44%	10
< 40%	0

According to the County of Fresno online mapping system and Fresno County Assessor data, there is no record of protected resource land within the ZOI. Therefore, based on the surrounding agricultural activities and uses, the Project site's Surrounding Agricultural Land Ratings are 0.

Final LESA Determination

A single LESA score is generated for a given project after a comprehensive review of all parcels within the project area have been scored and weighted. The California Agricultural LESA Model is weighted so that 50 percent of the total LESA score of a given project is derived from the land evaluation factors and 50 percent is derived from the Site Assessment factors. Individual factor weights are listed below, with the sum of the factor weights required to equal 100 percent. Table 4-8 lists the factors and percentages used in LESA scoring.

Table 4-8
LESA Factors and Weighted Percentages

LESA Factors	Percentages
Land Evaluation Factors	
Land Capability Classification (LCC)	10.0
Storie Index Rating	6.0
Land Evaluation (LE) Subtotal	**16.0**
Site Assessment Factors	
Project Size Rating	0
Water Resource Availability	15.0
Surrounding Agricultural Lands	0.0
Surrounding Protected Resource Lands Rating	0.0
Site Assessment (SA) Subtotal	**15.0**
Total LESA Factor Weighting	**31.0**

Notes: LESA scoring sheet provided in Appendix A.

The Project's LESA score is 31.0, which is a comprehensive score for the Project.

Table 4-9 articulates the California LESA Model Scoring Thresholds for determining the significance of a project's impacts.

Table 4-9
California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39	Not Considered Significant
40 to 59 Points	Considered Significant only if LE and SA subscores are each greater than or equal to 20 points
60 to 79 Points	Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100 Points	Considered Significant

This determination is based on the results of the California Agricultural LESA prepared for the Project (Appendix A). The LESA Model concludes that the Project has a comprehensive score of 31.0 points, which falls within the "Not Considered Significant" scoring decision. Therefore, there is a less than a significant environmental impact due to the overall size of the Project. The LESA Model concludes that the conversion of the approximately 30.3 acres of Farmland of Local Importance to a non-agricultural use would constitute a less than significant impact.



Figure 4-1
Zone of Influence

SECTION 5 - IMPACT ANALYSIS

CEQA Guidelines Appendix G, that a project would have a significant impact on agriculture and forestry resources if it would:

A. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
B. Conflict with existing zoning for agricultural use or Williamson Act contract.
C. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)) or timberland (as defined in Public Resources Code Section 4526) or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)).
D. Result in the loss of forestland or conversion of forest land to non-forest use.
E. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

5.1 - Convert Important Farmland

5.1.1 - IMPACT ANALYSIS

As mentioned in Section 1.2, the Project proposes the development of a 187-unit single-family residential subdivision. The Project also includes on- and off-site improvements including external city circulation roads, interior local streets, curbs, gutters, storm drains, sidewalks, pedestrian walking trail for future connection, open space, landscaping, lighting and retaining walls, all of which will be developed to City standards by the Project developer.

The Specific Plan land use designation of the Project site is Residential Medium Density (5.0-12 D.U./acre) and zoned RS-5 (single-family medium density), as shown in Figure 1-4. The Project includes a request for approval of a Vesting Tentative Tract Map.

The California Department of Conservation (DOC) has classified the Project site as Farmland of Local Importance under the Farmland Mapping and Monitoring Program (FMMP) (QK, 2025a). According to the DOC, the Project parcel is not subject to a Williamson Act land use contract. The implementation of the proposed Project would convert Farmland of Local Importance, as designated by DOC, to a non-agricultural use. However, the Specific Plan Mitigation Measure 3.2-1 only applies land designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. Therefore, given the Project site's Farmland of Local Importance designation, the does not apply to the Project because the land is not designated Prime Farmland, Farmland of Statewide Importance, and Unique Farmland.

Although the Project is designated as Farmland of Local Importance, the City requested a LESA for this Project in order to assess the significance of the project-specific impacts to agricultural resources. The LESA Model is composed of a Land Evaluation (LE) portion, which measures soil quality, and the Site Assessment (SA) portion, which evaluates parcel

size and on-farm investments. The LE and SA subscores are summed to determine the Final LESA score. A Final LESA Score of 0 to 39 points is not considered significant. A final score between 40 to 59 points is considered significant only if the LE and SA subscores are each greater than or equal to 20 points. A final score between 60 to 79 points is considered significant unless either the LE or SA subscores is less than 20 points. A final score between 80 to 100 points is considered significant.

The proposed Project's Final LESA Score is 31.0 points, with an LE subscore of 16.0 points and a SA subscore of 15.0 points. Due to the subject parcel being designated a Farmland of Local Importance and a Final LESA Score below 39 points, the conversion of agricultural land associated with implementation of the proposed Project would not represent a significant impact to agricultural resources under CEQA. Therefore, impacts related to the conversion of Farmland of Local Importance to a non-agricultural use would be less than significant.

MITIGATION MEASURES

No mitigation is required.

Level of Significance

Impact would be *less than significant.*

5.2 - Conflict with Existing Zoning for Agricultural Use or a Williamson Act Contract

5.2.1 - IMPACT ASSESSMENT

This impact evaluates the potential for the proposed Project to conflict with existing agricultural zoning or Williamson Act contracts.

The subject property has a land use designation of Residential Medium Density (5.0-12 D.U./acre) within the West Area Neighborhoods Specific Plan (WANSP) and is zoned RS-5 (Residential Single-Family, Medium Density). The Project site is not subject to a Williamson Act land use contract. Therefore, development of the proposed Project would not conflict with agricultural zoning or use or a Williamson Act contract and would have no impact.

MITIGATION MEASURES

No mitigation is required.

Level of Significance

There would be no impact.

5.3 - Forest Land and Timberland

5.3.1 - IMPACT ASSESSMENT

This impact evaluates the potential for the proposed Project to conflict with existing forest land or timberland zoning or result in the loss of forest land or result in the conversion of forest land to non-forest use.

The Project site is located within an increasingly urban area and is located within a residential zoning district (RS-5). Pursuant to Public Resources Code (PRC) section 12220(g)), "forest land" is land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions. PRC Section 4526 defines timberland as "land, other than land owned by the federal government and land designated by the State Board of Forestry as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products. The Project site is currently an open field, which does not meet the criteria to be defined as forest land or timberland.

Therefore, the proposed Project would not conflict with the existing zones for, or cause rezoning of, forest land or conversion of forest land to non-forest uses. Therefore, the proposed Project would have no impact.

MITIGATION MEASURES

No mitigation is required.

Level of Significance

There would be no impact.

5.4 - Result in the Loss of Forest Land or Conversion of Forest Land to Non-Forest Use

5.4.1 - IMPACT ASSESSMENT

As mentioned in Section 5.3, the Project site is not used for timberland production or zoned for forest uses and would not result in the loss of forest land or conversion of forest land. Therefore, the proposed Project would have no impact.

MITIGATION MEASURES

No mitigation is required.

Level of Significance

There would be no impact.

5.5 - Involve Other Changes in the Existing Environment, Which Due to Their Location or Nature, Could Result in conversion of Farmland to Non-Agricultural Use or Conversion of Forest Land to Non-Forest Use.

5.5.1 - IMPACT ASSESSMENT

Please refer to Sections 5.1 and 5.3. The Project site is classified as Farmland of Local Importance by the DOC FMMP. Since the subject parcel is designated a Farmland of Local Importance and a Final LESA Score below 39 points, the conversion of agricultural land associated with implementation of the proposed Project would not represent a significant impact to agricultural resources under CEQA without additional mitigation required to offset for the conversion of agricultural lands to non-agricultural residential use.

MITIGATION MEASURES

No mitigation is required.

Level of Significance

Impact would be *less than significant.*

5.6 - Cumulative Impacts

5.6.1 - IMPACT ASSESSMENT

Fresno County ranks high on the list of California counties with respect to urbanization and loss of farmland. Although growth in population is likely to decrease the amount of agricultural land in Fresno County in the future, other factors, including the availability of water also contribute to decreases in farmland. In comparison, there is approximately 1,158.12 acres total of land classified for Farmland of Local Importance within the Plan Area, therefore, the conversion of the Project site would result in a 0.026 percent decrease in Farmland of Local Importance within the Plan Area.

Current conditions related to drought, water availability, and the economic impacts of water purchases may have resulted in the decision-making to develop the Project site.

Besides the beneficial aspects of the Project relative to development of housing, job creation and increased property taxes, implementation of the Project may have favorable impacts on local agriculture by reducing onsite water consumption, thereby making more water available for other farmers.

The Specific Plan concluded that with mitigations impacts on Williamson Act contracts, and important or significant farmlands are forest resources remain cumulatively considerable and significant and unavoidable.

MITIGATION MEASURES

No mitigation measures are required.

Level of Significance

Cumulative impacts would be *less than significant*.

SECTION 6 - SUMMARY OF FINDINGS

This study evaluated the overall impact of a Project that is approximately 30.30 acres of Farmland of Local Importance that was used in previous years for agricultural production and will be permanently removed from agricultural production. This study concluded that due to the subject parcel being designated a Farmland of Local Importance and a Final LESA Score below 39 points, the conversion of agricultural land associated with implementation of the proposed Project would not represent a significant impact to agricultural resources under CEQA without additional mitigation required to offset for the conversion of agricultural lands to non-agricultural residential use.

Using the LESA Model to analyze the impacts of converting agricultural resources to non-agricultural uses, this analysis finds that the Project:

- Would not result in the removal of a potentially significant amount of Important Farmland from agricultural production based on a qualitative analysis.
- Would not conflict with existing zoning for agricultural use or a Williamson Act contract.
- Would not result in a significant impact based on a quantitative assessment using the LESA Model.
- Would not encourage the premature removal of properties held under a Williamson Act contract located within the Project's vicinity.
- Would not result in a significant impact to agricultural resources under CEQA.
- Would not result in a cumulatively significant and unavoidable Project-level impact to agricultural resources under CEQA.

For these reasons, the Project's impact on agricultural resources is considered ***less than significant*** pursuant to CEQA.

SECTION 7 - REFERENCES

California Department of Conservation. 2023. "2020-2022 California Farmland Conversion Report."

—. 2011. "California Important Farmland Data, Fresno County, 2016-2018." *Fresno County-Important Farmland Data Availability.* Accessed August 2024. https://www.conservation.ca.gov/dlrp/fmmp/Pages/Fresno.aspx.

—. 2004. *Important Farmland Categories.* Accessed 2024. https://www.conservation.ca.gov/dlrp/fmmp/Pages/Important-Farmland-Categories.aspx.

—. 2011. *Williamson Act Program Overview.* Accessed 2024. https://www.conservation.ca.gov/dlrp/wa/Pages/wa_overview.aspx.

California Department of Food and Agriculture . 2024. "2023-2024 California Agricultural Statistics Review ."

California Department of Water Resources. 2024. *Hydrologic Regions.* https://cww.water.ca.gov/regionscale.

City of Fresno. 2020. "City of Fresno Community Plans." December 3. Accessed November 25, 2024. https://www.fresno.gov/wp-content/uploads/2023/04/planbnds1-1.pdf.

City of Fresno Development and Resource Management Department. 2014. "FRESNO General Plan."

City of Fresno Planning and Development Department. 2025b. "Recirculated Draft Environmental Impact Report."

City of Fresno Planning and Development Department. 2025a. "West Area Neighborhoods Specific Plan."

Fresno County Department of Agriculture and Measurement Standards. 2023. "Fresno County Agricultural Crop Report."

Fresno Irrigation District. 2018. "District Maps - District Facilities."

—. 2020. "Water Management Plan ." 11 5. https://www.fresnoirrigation.com/_files/ugd/932427_896210933830433b82bcd04e1cf4684f.pdf.

QK. 2025. "Water Supply Assessment for VTTM 6294."

United States Department of Agriculture (USDA). 2023. *Natural Resources Conservation Service.* Accessed August 2021.

US Climate Data. 2024. *Fresno County Climate.* November 4. https://www.usclimatedata.com/climate/fresno/california/united-states/usca2234#google_vignette.

USDA. 2021. *Natural Resources Conservation Service.* https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/?cid=nrcs143_014040.

Western Regional Climate Center. 2017. *Fresno Yosemite Intl AP, California (043257).* Accessed October 8, 2025. https://wrcc.dri.edu/summary/Climsmcca.html.

Appendix A—LESA Model Worksheet

Factor Name	Factor Rating	Weight	Weighted Factor Rating
Land Evalution			
Land Compatibility Classification	40.0	0.25	10.0
Storie Index Rating	24.0	0.25	6.0
Site Assessment			0.0
Project Size (enter acreage)	0.0	0.15	0.0
Water Resource Availability	100.0	0.15	15.0
Surrounding Agricultural Lands	0.0	0.15	0.0
Protected Resource Lands	0.0	0.05	0.0
		Total LESA Score	**31.0**

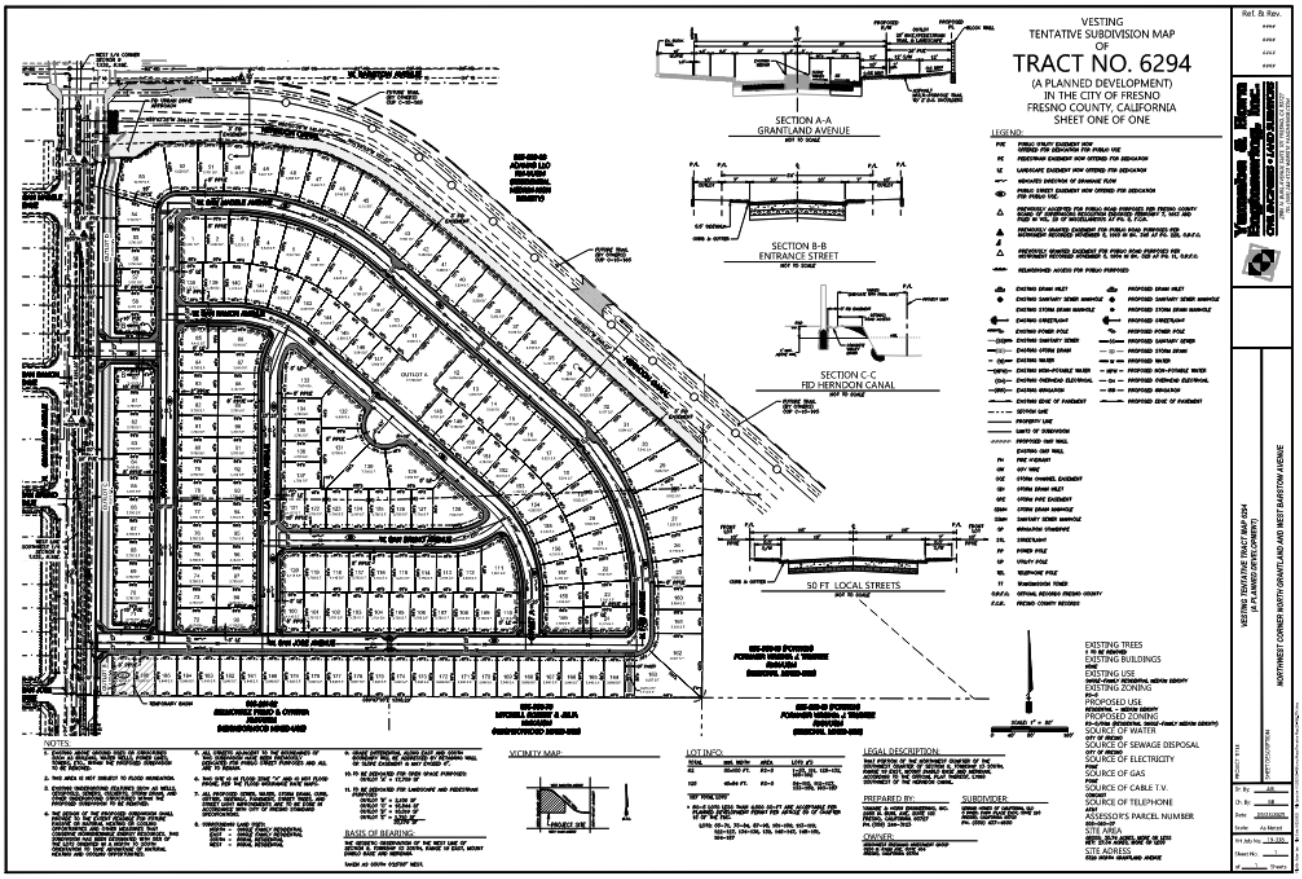
Table 9. California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39 Points	Not Considered Significant
40 to 59 Points	Considered Significant only if LE and SA subscores are each greater than or equal to 20 points
60 to 79 Points	Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100 Points	Considered Significant

-

AIR QUALITY IMPACT ANALYSIS

LENNAR HOMES VTTM NO. 6294



DECEMBER 2025

AIR QUALITY IMPACT ANALYSIS

LENNAR HOMES VTTM NO. 6294

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December 2025

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Project #200124.03

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
AAQA	Ambient Air Quality Analysis
AB	Assembly Bill
AERMOD	Air Dispersion Modeling and Risk Assessment Tool
AQAP	Air Quality Attainment Plans
AQIA	Air Quality Impact Analysis
BACT	best available control technology
BAU	business as usual
BMCM	Bulk Material Control Measures
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAT	Climate Action Team
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFCs	chlorofluorocarbons
CH_4	Methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalents
EGR	exhaust gas recirculation
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GAMAQI	Guidance for Assessing and Mitigating Air Quality Impacts
GHG	greenhouse gas
GPA	General Plan Amendments
GWP	Global Warming Potential
H_2S	hydrogen sulfide
HAPs	hazardous air pollutants
HARP	Hotspots Analysis and Reporting Program
HI	hazard index
IPCC	Intergovernmental Panel on Climate Change
FresnoCOG	Fresno Council of Governments
LOS	Level of Service
M-1	Light Manufacturing
M-2	General Manufacturing
M-3	Heavy Industrial
MMT CO_2e	million metric tons of CO_2 equivalent
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards

NO_2	nitrogen dioxide
NOx	nitrogen oxides
NSR	New Source Review
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
Pb	lead
PM	particulate matter
PM_{10}	particulate matter 10 micrometers
$PM_{2.5}$	particulate matter 2.5 micrometers
PMI	point of maximum impact
PSD	Prevention of Significant Deterioration
RACM	Reasonably Available Control Measures
ROG	reactive organic gases
RPS	Renewables Portfolio Standard
SB	Senate Bill
SIL	significant impact levels
SIPs	State Implementation Plans
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
SOx	sulfur oxides
USGCRP	United States Global Change Research Program
USGS	United States Geological Survey
VDE	visible dust emissions
VERA	Voluntary Emission Reduction Agreement

SECTION 1 - EXECUTIVE SUMMARY

Quad Knopf, Inc. (QK) has completed an Air Quality Impact Analysis (AQIA) for the VTTM 6294 Project (Project) on behalf of Lennar Homes of California (Lennar). The Project is located at the southeast corner of North Grantland Avenue and West Barstow Avenue in the City of Fresno, CA within Fresno County. Vesting Tentative Tract Map No. 6294 (VTTM 6294) will subdivide the subject property into a 187-lot single-family residential subdivision with five (5) outlots.

The proposed Project's construction and operations would include the following criteria pollutant emissions: reactive organic gases (ROG), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and suspended particulate matter (PM_{10} and $PM_{2.5}$). Project operations would generate air pollutant emissions from mobile (vehicle activity from residents), energy sources (natural gas and electricity usage), and area sources (incidental activities related to architectural coating, consumer products, and landscape maintenance). Project construction and operational activities would also generate greenhouse gas (GHG) emissions. Criteria and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2022.1.1.35 (California Air Pollution Control Officers Association (CAPCOA), 2024), which is the most current version of the model approved for use by the San Joaquin Valley Air Pollution Control District (SJVAPCD).

Table 4-3 presents the Project's construction emissions and provides substantial evidence to support a less-than-significant air quality impact on the San Joaquin Valley Air Basin (SJVAB).

Table 4-4 presents the Project's operations emissions and provides substantial evidence to support a less-than-significant air quality impact on the SJVAB after mitigation.

SJVAPCD uses a single threshold for the determination of significance for both project-specific and cumulative impacts. As such, a qualitative evaluation of the cumulative projects supports the finding that the Project's contribution would not be cumulatively considerable because the proposed Project's incremental emissions would be *less than significant*.

SECTION 2 - INTRODUCTION

2.1 - Purpose

This AQIA was prepared pursuant to the SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD, 2015) and the California Environmental Quality Act (CEQA) Statute and Guidelines (CEQA, 2024).

2.2 - General Project Description

The Project subject property is approximately 30 acres (APN 505-060-07) located at the southeast corner of North Grantland Avenue and West Barstow Avenue in the City of Fresno. Vesting Tentative Tract Map No. 6294 (VTTM 6294) will subdivide the subject property into a 187-lot single-family residential subdivision with five (5) outlots.

- Outlot A will be dedicated for open space and recreation in the center of the residential subdivision.
- Outlot B through Outlot D will be dedicated for landscaping, irrigation and pedestrian purposes, located along North Grantland Avenue frontage.
- Outlot E is located near the southeastern corner boundary and will be dedicated for connectivity to a future pedestrian trail.

The Project also includes on- and off-site improvements including external city circulation roads, interior local streets, curbs, gutters, storm drains, sidewalks, pedestrian walking trail for future connection, open space, landscaping, lighting and retaining walls, all of which will be developed to City standards by the Project developer.

All residential units will be equipped with 410-watt solar panels, utilize all electric appliances and will be EV-ready (pre-wired during construction to allow for installation of EV residential charger in the future).

Figure 2-1 depicts the regional location and Figure 2-2 depicts an aerial view of the Project location.

Figure 2-3 depicts the Project site's topography. The Project site is located at an elevation of approximately 292 feet above mean sea level and is surrounded by residential, industrial, and agricultural.

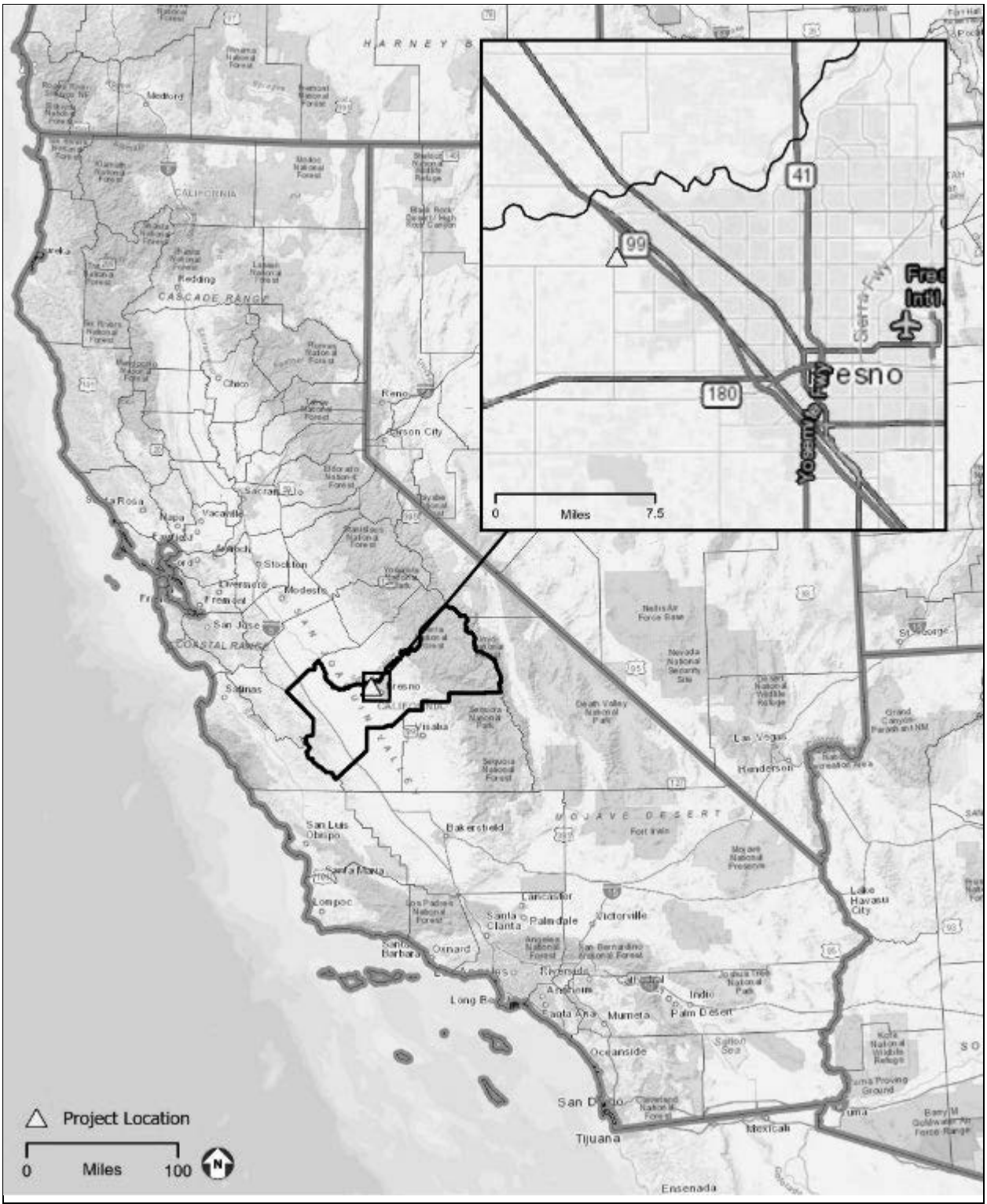


Figure 2-1
Regional Location



Figure 2-2
Project Location

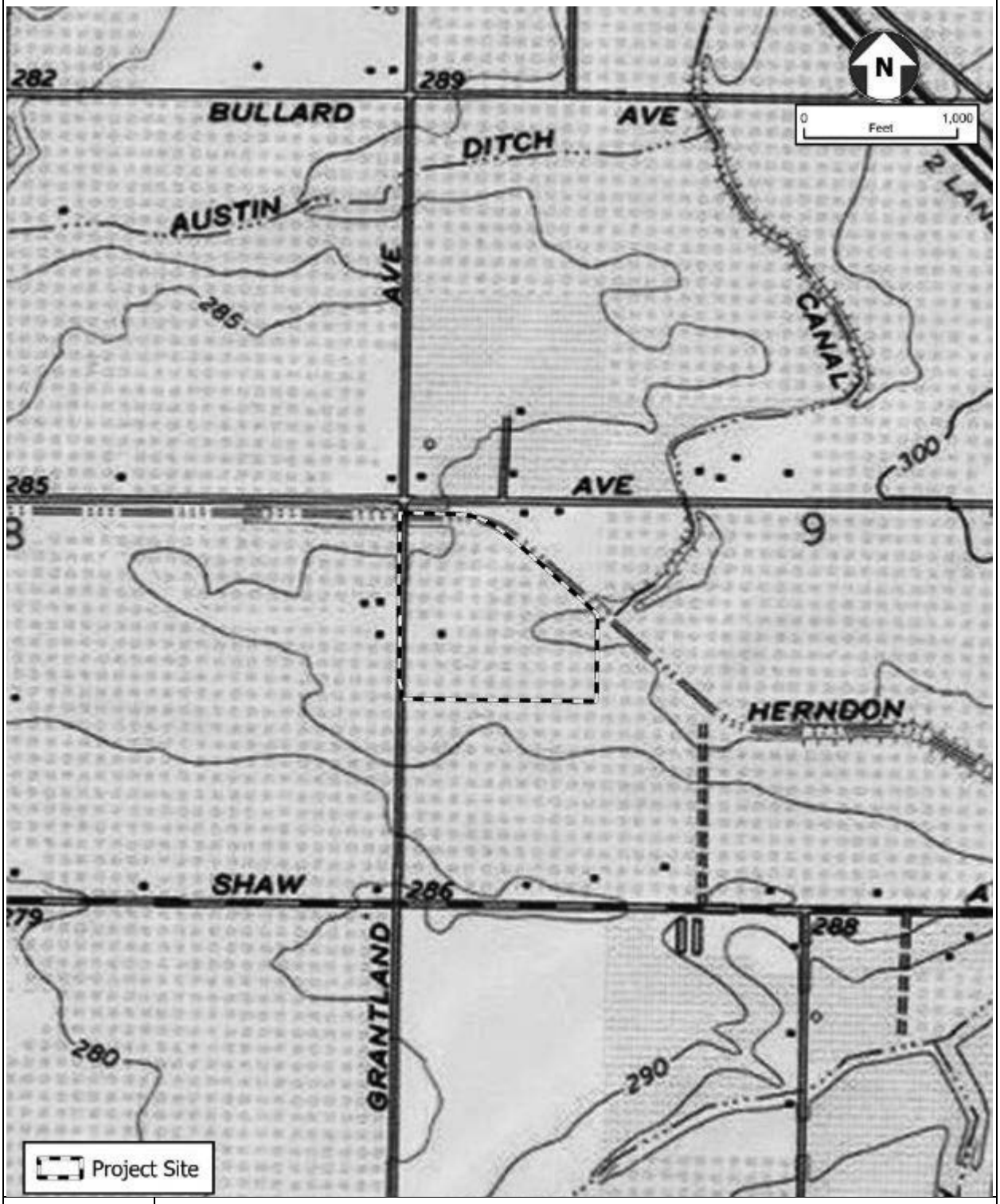


Figure 2-3
Project Site Topography

SECTION 3 - SETTING

Protection of public health is maintained through the attainment and maintenance of ambient air quality standards for various atmospheric compounds and the enforcement of emissions limits for individual stationary sources. The Federal Clean Air Act requires that the U.S. Environmental Protection Agency (EPA) establish National Ambient Air Quality Standards (NAAQS) to protect the health, safety, and welfare of the public. NAAQS have been established for ozone (O_3), CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$, and lead (Pb). California has also adopted ambient air quality standards (CAAQS) for these "criteria" air pollutants. CAAQS are more stringent than the corresponding NAAQS and include standards for hydrogen sulfide (H_2S), vinyl chloride (chloroethene), and visibility-reducing particles. The U.S. Clean Air Act Amendments of 1977 required each state to identify areas that were in non-attainment of the NAAQS and to develop State Implementation Plans (SIPs) containing strategies to bring these non-attainment areas into compliance. NAAQS and CAAQS designation/classification for Fresno County are presented in Section 3.1 below.

Responsibility for the regulation of air quality in California lies with the California Air Resources Board (CARB) and the 35 local air districts, with oversight responsibility held by the EPA. CARB is responsible for regulating mobile source emissions, establishing CAAQS, conducting research, managing regulation development, and providing oversight and coordination of the activities of the 35 air districts. The air districts are primarily responsible for regulating stationary source emissions and monitoring ambient pollutant concentrations. CARB also determines whether air basins, or portions thereof, are “unclassified,” in “attainment,” or in “non-attainment” for the NAAQS and CAAQS relying on statewide air quality monitoring data.

3.1 - Air Quality Standards

The Project area is located within Fresno County in the San Joaquin Valley Air Basin (SJVAB or Basin). Fresno County is included among the eight counties that comprise the SJVAPCD. The SJVAPCD acts as the regulatory agency for air pollution control in the Basin and is the local agency empowered to regulate air pollutant emissions for the Project area. Table 3-1 provides the NAAQS and CAAQS.

Table 3-1
Federal and California Standards

Pollutant	Averaging Time	NAAQS	CAAQS
		Concentration	
O_3	8-hour	0.070 ppm (137 µg/m³)[a]	0.070 ppm (137 µg/m³)
	1-hour		0.09 ppm (180 µg/m³)
CO	8-hour	9 ppm (10 µg/m³)	9 ppm (10 µg/m³)
	1-hour	35 ppm (40 µg/m³)	20 ppm (23 µg/m³)
NO_2	Annual Average	53 ppb (100 µg/m³)	0.030 ppm (57 µg/m³)
	1-Hour	100 ppb (188.68 µg/m³)	0.18 ppm (339 µg/m³)
SO_2	3-Hour	0.5 ppm (1,300 µg/m³)	
	24 Hour	0.14 ppm (365 µg/m³)	0.04 ppm (105 µg/m³)
	1-Hour	75 ppb (196 µg/m³)	0.25 ppm (655 µg/m³)
Particulate Matter (PM_{10})	Annual Arithmetic Mean		20 µg/m³
	24-Hour	150 µg/m³	50 µg/m³
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m³	12 µg/m³
	24-Hour	35 µg/m³	
Sulfates	24-Hour		25 µg/m³
Pb[d]	Rolling Three-Month Average	0.15 µg/m³	
	30 Day Average		1.5 µg/m³
H_2S	1-Hour		0.03 ppm (42 µg/m³)
Vinyl Chloride (chloroethene)	24-Hour		0.010 ppm (26 µg/m³)
Visibility Reducing particles	8 Hour (1000 to 1800 PST)		

ppm = parts per million
ppb = parts per billion
mg/m³ = milligrams per cubic meter
µg/m³ = micrograms per cubic meter

Source: CARB 2024b
a. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm
b. In 1989, CARB converted both the general statewide 10-mile visibility standards and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Under the provisions of the U.S. Clean Air Act, the Fresno County portion of the SJVAB has been classified as non-attainment/extreme, non-attainment/severe, non-attainment, attainment/ unclassified, attainment, or unclassified under the established NAAQS and CAAQS for various criteria pollutants. Table 3-2 provides the SJVAB's designation and classification based on the various criteria pollutants under both NAAQS and CAAQS.

Table 3-2
SJVAB Attainment Status

Pollutant	NAAQS[a]	CAAQS[b]
Ozone – 1 Hour	No Federal Standard[f]	Non-attainment/Severe
Ozone – 8 Hour[8]	Non-attainment/Extreme[e]	Non-attainment
PM_{10}	Attainment[c]	Non-attainment
$PM_{2.5}$	Non-attainment[d]	Non-attainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead Particulates	No Designation/Classification	Attainment
H_2S	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particulates	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

Source: SJVAPCD 2025a
Notes:
a. See 40 CFR Part 81
b. See CCR Title 17 Sections 60200-60210
c. On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM_{10} National Ambient Air Quality Standard (NAAQS) and approved the PM_{10} Maintenance Plan.
d. The Valley is designated non-attainment for the 1997 $PM_{2.5}$ NAAQS. EPA designated the Valley as non-attainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).
e. Though the Valley was initially classified as serious non-attainment for the 1997 8-hour O_3 standard, EPA approved Valley reclassification to extreme non-attainment in the Federal Register on May 5, 2010 (effective June 4, 2010).
f. Effective June 15, 2005, the EPA revoked the federal 1-hour O_3 standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme non-attainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour O3 non-attainment areas continue to apply to the SJVAB.

The SJVACPD, along with CARB, operates an air quality monitoring network that provides average concentrations of those pollutants for which State or federal agencies have established ambient air quality standards. Information from the various monitoring stations is available from the corresponding agency's websites. A map of the monitoring stations in the SJVAB is provided in Figure 3-1 below.

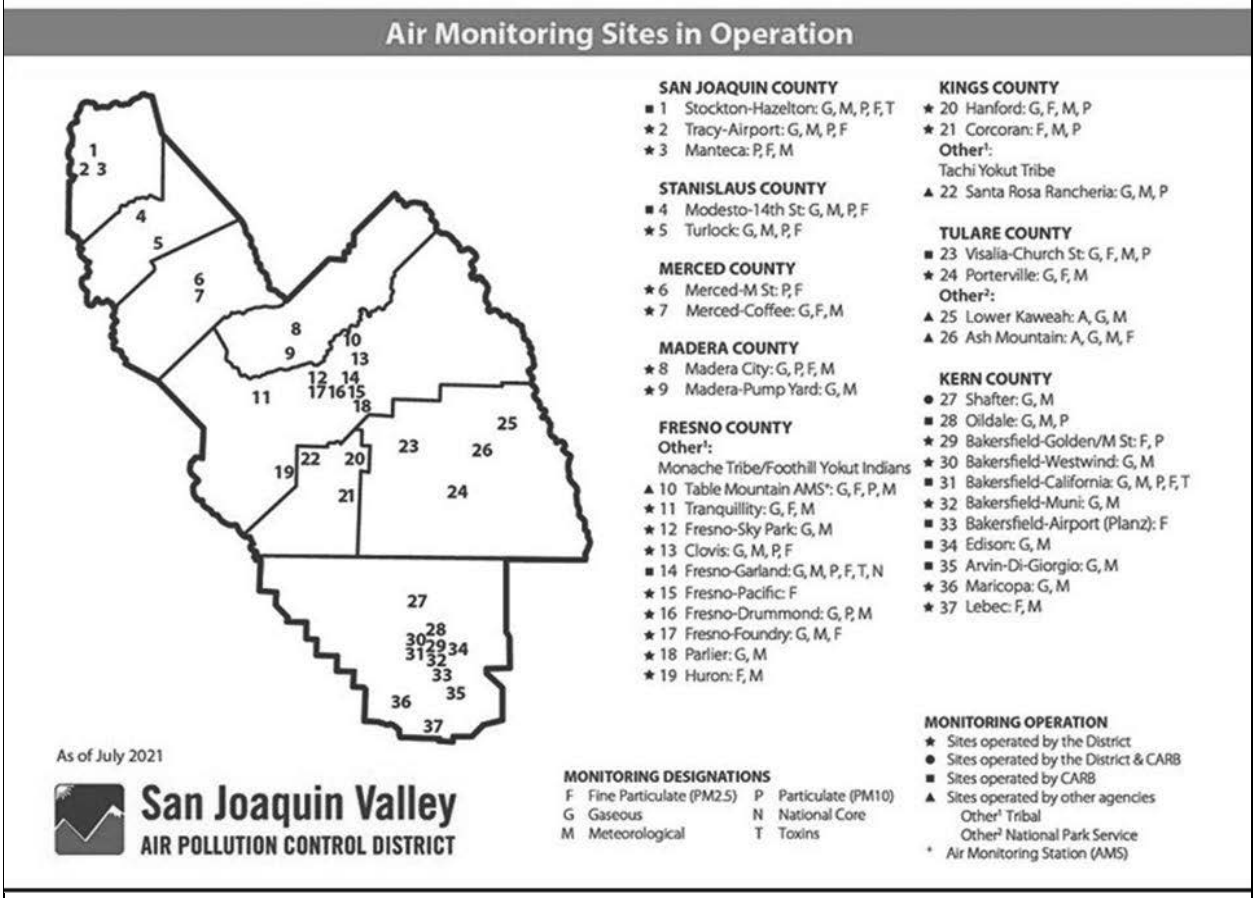


Figure 3-1
CARB Monitoring Network

3.2 - Existing Air Quality

For the purposes of background data and this air quality assessment, this analysis relied on data collected in the last three years for the CARB monitoring stations that are located in closest proximity to the Project site. Table 3-3 provides the background concentrations for O_3, particulate matter of 10 microns (PM_{10}), particulate matter of less than 2.5 microns ($PM_{2.5}$), CO, NO_2, Pb and H_2S as of 2024. Information is provided for the Fresno – Sierra Skypark #2, Clovis – N Villa Avenue, and Fresno – Garland for 2022 through 2024. No data is available for SO_2, Vinyl Chloride, or other toxic air contaminants in the SJVAB.

Table 3-3
Existing Air Quality Monitoring Data in Project Area

Pollutant and Monitoring Station Location	Maximum Concentration			Days Exceeding Standard		
	2022	2023	2024	2022	2023	2024
O_3 – 1-hour CAAQS (0.09 ppm)						
Fresno – Sierra Skypark #2	0.097	0.101	0.107	1	2	4
Fresno - Garland	0.096	0.101	0.103	2	3	4
O_3 – 8-hour NAAQS (0.070 ppm)						
Fresno – Sierra Skypark #2	0.083	0.079	0.084	5	11	25
Fresno - Garland	0.083	0.084	0.085	10	15	9
O_3 – 8-hour CAAQS (0.070 ppm)						
Fresno – Sierra Skypark #2	0.083	0.080	0.084	5	12	28
Fresno - Garland	0.083	0.084	0.086	10	17	10
PM_{10} – 24-hour CAAQS (50 µg/m³)						
Clovis – N Villa Avenue	120.0	103.1	119.1	73	44	66
Fresno – Garland	109.2	107.8	128.9	73	54	60
PM_{10} – 24-hour NAAQS (150 µg/m³)						
Clovis – N Villa Avenue	127.0	104.7	122.7	0	0	0
Fresno - Garland	116.1	109.3	132.9	0	0	0
$PM_{2.5}$ - 24-hour NAAQS (35 µg/m³)						
Clovis – N Villa Avenue	41.9	34.7	51.3	4	0	7
Fresno - Garland	53.3	39.1	52.8	13	4	7
CO - 8-Hour CAAQS & NAAQS (9.0 ppm)						
No data collected	*	*	*	*	*	*
NO_2 - 1-Hour CAAQS (0.18 ppm)						
Fresno – Sierra Skypark #2	0.034	0.040	0.034	0	0	0
Fresno - Garland	0.054	0.047	0.042	0	0	0
NO_2 - 1-Hour NAAQS (0.10 ppm)						
Fresno – Sierra Skypark #2	0.035	0.041	0.034	0	0	0
Fresno - Garland	0.055	0.048	0.042	0	0	0
SO_2 – 24-hour Concentration - CAAQS (0.04 ppm) & NAAQS (0.14 ppm)						
No data collected	*	*	*	*	*	*
Pb - Maximum 30-Day Concentration CAAQS (1500 ng/m³)						
Fresno - Garland	42	6.5	6.5	*	*	*
H2S – 1-Hour CAAQS (0.03 ppm)						
No data collected	*	*	*	*	*	*

Source: CARB 2024
Notes: ppm= parts per million
* There was insufficient (or no) data available to determine the value.

The following describes criteria air pollutants, typical sources, health effects, and recently documented pollutant levels in the Project vicinity.

3.2.1 - OZONE (O_3)

The SJVAB has high concentrations of O_3, and these high levels are known to cause eye irritation and impair respiratory functions. High levels of O_3 can also affect plants and materials. Grapes, lettuce, spinach, and many types of garden flowers and shrubs are particularly vulnerable to O_3 damage. O_3 is not directly emitted into the atmosphere; it is a secondary pollutant produced from a photochemical interaction between hydrocarbons and nitrogen oxides (NOx). One to three hours of strong sunlight in a stable atmosphere creates O_3. The "O_3 season," therefore, typically spans from April through October. O_3 is a regional pollutant; wind transports and diffuses the precursors while activating the photochemical reaction process. The data presented in Table 3-3 shows that the Project area monitoring stations exceeded the 1-hour average ambient O_3 CAAQS and the 8-hour average ambient O_3 NAAQS and CAAQS between 2022 through 2024.

3.2.2 - SUSPENDED PARTICULATE MATTER (PM_{10} AND $PM_{2.5}$)

Both NAAQS and CAAQS now apply to particulates under 10 microns (PM_{10}). Since the smaller diameter fraction of total suspended particulates is documented to represent the greatest health hazard, EPA has established NAAQS for particulates under 2.5 microns ($PM_{2.5}$). The Project area is classified as attainment for PM_{10} and non-attainment for $PM_{2.5}$ for NAAQS.

Dust and fumes from industrial and agricultural operations generate particulate matter. Natural activities, such as wind-raised dust, fires, and ocean spray, also increase the level of particulates in the atmosphere. The largest source of PM_{10} and $PM_{2.5}$ in Fresno County is vehicle movement over paved and unpaved roads from demolition and construction activities and farming operations. PM_{10} and $PM_{2.5}$ are considered regional pollutants, with elevated levels typically occurring over a wide geographic area. Concentrations tend to be highest in the winter, during periods of high atmospheric stability and low wind speed. Very small particulates may contain absorbed gases that produce injury to the respiratory tract. Particulates of aerosol size suspended in the air can both scatter and absorb sunlight, producing haze and reducing visibility. They can also damage a wide range of materials. Table 3-3 shows that PM_{10} levels exceeded the CAAQS, and both PM_{10} and $PM_{2.5}$ exceeded the NAAQS in 2022 and 2024, respectively. Similar levels can be expected to occur in the vicinity of the Project site.

3.2.3 - CARBON MONOXIDE (CO)

Ambient CO concentrations normally correspond closely to the spatial and temporal distributions of vehicular traffic. Relatively high concentrations of CO would be expected along heavily traveled roads and near busy intersections. Wind speed and atmospheric mixing also influence CO concentrations.

Internal combustion engines, principally in vehicles, produce CO due to incomplete fuel combustion. Various industrial processes also produce CO emissions through incomplete combustion. Gasoline-powered motor vehicles are typically the major source of this contaminant. CO does not irritate the respiratory tract but passes through the lungs directly into the bloodstream, and by interfering with the transfer of fresh oxygen to the blood, deprives sensitive tissues of oxygen, thereby aggravating cardiovascular disease, causing fatigue, headaches, and dizziness. CO is not known to have adverse effects on vegetation, visibility, or materials. Table 3-3 reports insufficient data for the CO monitoring at any monitoring stations during the three-year period from 2022 through 2024.

3.2.4 - NITROGEN DIOXIDE (NO_2) AND HYDROCARBONS

Fresno County has been designated as an attainment/unclassified area for the NAAQS for NO_2. NO_2 is the "whiskey brown" colored gas readily visible during periods of heavy air pollution. Mobile sources account for nearly all the County's NOx emissions, most of which are emitted as NO_2. Combustion in motor vehicle engines, power plants, refineries, and other industrial operations are the primary sources in the air basin. Railroads and aircraft are other potentially significant sources of combustion air contaminants. Oxides of nitrogen are direct participants in photochemical smog reactions. The emitted compound, nitric oxide, combines with oxygen in the atmosphere in the presence of hydrocarbons and sunlight to form NO_2 and O_3. NO_2, the most significant of these pollutants, can color the atmosphere at concentrations as low as 0.5 ppm on days of 10-mile visibility. NOx is an important air pollutant in the region because it is a primary receptor of ultraviolet light, which initiates the reactions producing photochemical smog. It also reacts in the air to form nitrate particulates.

Motor vehicles are the major source of reactive hydrocarbons in the basin. Other sources include evaporation of organic solvents and petroleum production and refining operations. Certain hydrocarbons can damage plants by inhibiting growth and by causing flowers and leaves to fall. Levels of hydrocarbons currently measured in urban areas are not known to cause adverse effects in humans. However, certain members of this contaminant group are important components in the reactions which produce photochemical oxidants. Table 3-3 shows that the NO_2 NAAQS and CAAQS were not exceeded over the three-year period of 2022 through 2024. Hydrocarbons are not currently monitored.

3.2.5 - SULFUR DIOXIDE

Fresno County has been designated as an attainment/unclassified area for the NAAQS for SO_2. SO_2 is the primary combustion product of sulfur or sulfur-containing fuels. Fuel combustion is the major source of this pollutant, while chemical plants, sulfur recovery plants, and metal processing facilities are minor contributors. Gaseous fuels (natural gas, propane, etc.) typically have lower percentages of sulfur-containing compounds than liquid fuels such as diesel or crude oil. SO_2 levels are generally higher in the winter months. Decreasing levels of SO_2 in the atmosphere reflect the use of natural gas in power plants and boilers.

At high concentrations, SO_2 irritates the upper respiratory tract. At lower concentrations, when respirated in combination with particulates, SO_2 can result in greater harm by injuring lung tissues. Sulfur oxides (SOx), in combination with moisture and oxygen, result in the formation of sulfuric acid, which can yellow the leaves of plants, dissolve marble, and oxidize iron and steel. SOx can also react to produce sulfates that reduce visibility and sunlight. Table 3-3 shows no data has been reported over the three-year period.

3.2.6 - Lead (Pb) and Suspended Sulfate

Ambient Pb levels have dropped dramatically due to the increase in the percentage of motor vehicles that run exclusively on unleaded fuel. Ambient Pb levels in Fresno (the closest monitoring station to the Project) are well below the ambient standard and are expected to continue to decline; the data reported in Table 3-3 only shows the highest concentration as the number of days exceeding standards is not reported. Suspended sulfate levels have stabilized to the point where no excesses of the State standard are expected in any given year.

3.3 - Climate

The most significant single control on the weather pattern of the San Joaquin Valley is the semi-permanent subtropical high-pressure cell, referred to as the "Pacific High." During the summer, the Pacific High is positioned off the coast of northern California, diverting ocean-derived storms to the north. Hence, the summer months are virtually rainless. During the winter, the Pacific High moves southward, allowing storms to pass through the San Joaquin Valley. Almost all the precipitation expected during a given year occurs from December through April. During the summer, the predominant surface winds are out of the northwest. Air enters the Valley through the Carquinez Strait and flows toward the Tehachapi Mountains. This up-valley (northwesterly) wind flow is interrupted in early fall by the emergence of nocturnal, down-valley (southeasterly) winds, which become progressively more predominant as winter approaches. Wind speeds are generally highest during the spring and lightest in fall and winter. The relatively cool air flowing through the Carquinez Strait is warmed on its journey south through the Valley. On reaching the southern end of the Valley, the average high temperature during the summer is nearly 100 degrees Fahrenheit (°F). Relative humidity during the summer is quite low, causing large diurnal temperature variations. Temperatures during the summer often drop into the upper 60s. In winter, the average high temperatures reach into the mid-50s, and the average low drops to the mid-30s. In addition, another high-pressure cell, known as the "Great Basin High," develops east of the Sierra Nevada Mountain Range during winter. When this cell is weak, a layer of cool, damp air becomes trapped in the basin, and extensive fog results. During inversions, vertical dispersion is restricted, and pollutant emissions are trapped beneath the inversion and pushed against the mountains, adversely affecting regional air quality. Surface-based inversions, while shallow and typically short-lived, are present most mornings. Elevated inversions, while less frequent than ground-based inversions, are typically longer lasting and create more severe air stagnation problems. The winter season characteristically has the poorest conditions for vertical mixing of the entire year.

Meteorological data for various monitoring stations is maintained by the Western Regional Climate Center. Meteorological data for the Project site is expected to be similar to the data recorded at the Fresno monitoring station. This data is provided in Table 3-4, which contains average precipitation data recorded at the Fresno monitoring station from January 1948 through June 2016 (the most recent data available at the time this report was prepared).

Table 3-4
Fresno, California Weather Data

Period of Record Monthly Climate Summary for the Period 01/01/1948 to 06/01/2016													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	54.6	61.5	67.0	74.4	83.5	91.7	98.3	96.4	90.8	79.7	65.3	54.7	76.5
Average Min. Temperature (F)	37.6	40.7	43.8	48.0	54.3	60.5	65.7	64.0	59.7	51.2	42.4	37.3	50.4
Average Total Precipitation (in.)	2.09	1.90	1.89	1.03	0.36	0.16	0.01	0.01	0.15	0.53	1.13	1.64	10.89
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record:
Max. Temp.: 100% Min. Temp.: 100% Precipitation: 100% Snowfall: 91.2% Snow Depth: 91.3%
Source: Western Regional Climate Center, 2025.

3.4 - Climate Change and Greenhouse Gases

3.4.1 - Global Climate Change

"Global climate change" refers to changes in average meteorological conditions on the earth with respect to temperature, precipitation, and storms, lasting for decades or longer. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred by some scientists and policymakers to "global warming" because it helps convey the notion that in addition to rising temperatures, other changes in global climate may occur. Climate change may result from the following influences:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun.
- Natural processes within the climate system (e.g., changes in ocean circulation).
- Human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, and desertification).

As determined from worldwide meteorological measurements between 1990 and 2005, the primary observed effect of global climate change has been a rise in the average global tropospheric temperature of 0.36 degrees Fahrenheit (°F) per decade. Climate change modeling shows that further warming could occur, which could induce additional changes in

the global climate system during the current century. Changes to the global climate system, ecosystems, and the environment of California could include higher sea levels, drier or wetter weather, changes in ocean salinity, changes in wind patterns, or more energetic aspects of extreme weather (e.g., droughts, heavy precipitation, heat waves, extreme cold, and increased intensity of tropical cyclones). Specific effects from climate change in California may include a decline in the Sierra Nevada snowpack, erosion of California's coastline, and seawater intrusion in the Sacramento-San Joaquin River Delta.

Human activities, including fossil fuel combustion and land use changes, release carbon dioxide (CO_2) and other compounds cumulatively termed greenhouse gases. GHGs are effective at trapping radiation that would otherwise escape the atmosphere. This trapped radiation warms the atmosphere, the oceans, and the earth's surface (USGCRP, 2014). Many scientists believe most of the warming observed over the last 50 years is attributable to human activities" (IPCC, 2014). The increased amount of CO_2 and other GHGs in the atmosphere is the alleged primary result of human-induced warming.

GHGs are present in the atmosphere naturally, released by natural sources, or formed from secondary reactions taking place in the atmosphere. They include CO_2, methane (CH_4), nitrous oxide (N_2O), and O_3. In the last 200 years, substantial quantities of GHGs have been released into the atmosphere, primarily from fossil fuel combustion. These human-induced emissions are increasing GHG concentrations in the atmosphere, therefore enhancing the natural greenhouse effect. The GHGs resulting from human activity are believed to be causing global climate change. While human-made GHGs include CO_2, CH_4, and N_2O, some (like chlorofluorocarbons [CFCs]) are completely new to the atmosphere. GHGs vary considerably in terms of Global Warming Potential (GWP), the comparative ability of each GHG to trap heat in the atmosphere. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG. The definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

Natural sources of CO_2 include the respiration (breathing) of animals and plants and evaporation from the oceans. Together, these natural sources release approximately 150 billion metric tons of CO_2 each year, far outweighing the seven billion metric tons of GHG emissions from fossil fuel burning, waste incineration, deforestation, cement manufacturing, and other human activity. Nevertheless, natural GHG removal processes such as photosynthesis cannot keep pace with the additional output of CO_2 from human activities. Consequently, GHGs are building up in the atmosphere (Enviropedia, 2019).

Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources of CH_4 production include wetlands, termites, and oceans. Human activity accounts for the majority of the approximately 500 million metric tons of CH_4 emitted annually. These anthropogenic sources include the mining and burning of fossil fuels, digestive processes in ruminant livestock such as cattle, rice cultivation, and the

decomposition of waste in landfills. The major removal process for atmospheric CH_4, the chemical breakdown in the atmosphere, cannot keep pace with source emissions; therefore, CH_4 concentrations in the atmosphere are rising.

Worldwide emissions of GHGs in 2008 were 30.1 billion metric tons of CO_2e and have increased considerably since that time (United Nations, 2011). Emissions from the top five emitting countries (China, the United States, India, the Russian Federation, and Japan) and the European Union accounted for approximately 70 percent of total global GHG emissions in 2014. The United States was the number two producer of GHG emissions, behind China. The primary GHG emitted by human activities was CO_2, representing approximately 80 percent of total GHG emissions (U.S. EPA, 2024).

In 2022, the United States emitted approximately 6,343.2 million metric tons of CO_2e. Between 1990 and 2022, CO2 emissions from fossil fuel combustion decreased by 1.1 percent; emissions decreased by 18.2 percent (1,044.7 MMT CO2e) from 2005 levels; and from 2021 to 2022, these emissions increased by 1.0 percent (45.1 MMT CO2e). (U.S. EPA, 2024).

Worldwide, energy-related CO_2 emissions are expected to increase through 2050. Projections indicate that resources, demand, and technology costs will drive the shift from fossil to non-fossil energy sources, but current policies are not enough to decrease global energy-sector emissions. This outcome is largely due to population growth, regional economic shifts toward more manufacturing, and increased energy consumption as living standards improve. Globally, we project increases in energy consumption to outpace efficiency improvements. China remains the primary source of energy-related CO_2 emissions through 2050 across all cases, although its share of total global CO_2 emissions declines. Further, across all cases we project India to displace the United States and our Other Asia-Pacific modeling region to displace Western Europe as the second- and third-highest emitters of energy-related CO_2 emissions by 2050, respectively. (U.S. EIA, 2023).

CARB is responsible for developing and maintaining the California GHG emissions inventory. This inventory estimates the amount of GHGs emitted into and removed from the atmosphere by human activities within California and supports the Assembly Bill (AB) 32 Climate Change Program. CARB's current GHG emission inventory covers the years 2000 through 2017 and is based on fuel use, equipment activity, industrial processes, and other relevant data (e.g., housing, landfill activity, and agricultural lands).

In 2022, emissions from statewide emitting activities were 371.1 million metric tons of CO_2 equivalent (MMT CO_2e), which is 9.3 MMT CO_2e lower than 2021 levels. 2022 emissions have decreased by 24 percent since peak levels in 2004 and are 59.9 MMT CO_2e below the 1990 emissions level and the State's 2020 GHG limit (CARB 2024a).

CARB estimates that transportation was the source of approximately 39 percent of California's GHG emissions in 2022, followed by industrial sources at 23 percent. Other sources of GHG emissions were electricity sources at 16 percent, residential plus commercial activities at 14 percent, and agriculture at 8 percent (CARB, 2024a).

3.4.2 - EFFECTS OF GLOBAL CLIMATE CHANGE

Changes in the global climate are assessed using historical records of temperature changes that have occurred in the past. Climate change scientists use this temperature data to extrapolate a level of statistical significance, specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from past climate changes in rate and magnitude.

The Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. In its Fifth Assessment Report, the IPCC predicted that the global mean temperature change from 1990 to 2100, could range from 1.1 degree Celsius (°C) to 6.4°C (8 to 10.4°Fahrenheit) (IPCC, 2013). Global average temperatures and sea levels are expected to rise under all scenarios (IPCC, 2014). The IPCC concluded that global climate change was largely the result of human activity, mainly the burning of fossil fuels. However, the scientific literature is not consistent regarding many aspects of climate change, the actual temperature changes during the 20th century, and contributions from human versus non-human activities.

Effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme weather events, and degradation of air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems. Heat-related problems include heat rash and heat stroke, drought, etc. In addition, climate-sensitive diseases may increase, such as those spread by mosquitoes and other disease-carrying insects. Such diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture. Global warming may also contribute to air quality problems from increased frequency of smog and particulate air pollution.

According to the 2006 California Climate Action Team (CAT) Report, several climate change effects can be expected in California over the course of the next century (CalEPA, 2006). These are based on trends established by the IPCC and are summarized below.

- A diminishing Sierra snowpack declining by 70 percent to 90 percent, threatening the State's water supply.
- A rise in sea levels, resulting in the displacement of coastal businesses and residences. During the past century, sea levels along California's coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Sea level rises of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats. (Note: This condition would not affect the proposed Project area, as it is a significant distance away from coastal areas.)
- An increase in temperature and extreme weather events. Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events

and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.

- Increased risk of large wildfires if rain increases as temperatures rise. Wildfires in the grasslands and chaparral ecosystems of southern California are estimated to increase by approximately 30 percent toward the end of the 21st century because more winter rain will stimulate the growth of more plant fuel available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- Increasing temperatures from 8 to 10.4°F under the higher emission scenarios, leading to a 25 percent to 35 percent increase in the number of days that ozone pollution levels are exceeded in most urban areas (see below).
- Increased vulnerability of forests due to forest fires, pest infestation, and increased temperatures.
- Reductions in the quality and quantity of certain agricultural products. The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.
- Exacerbation of air quality problems. If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.
- A decrease in the health and productivity of California's forests. Climate change can cause an increase in wildfires, an enhanced insect population, and the establishment of non-native species.
- Increased electricity demand, particularly in the hot summer months.
- Increased ground-level ozone formation due to higher reaction rates of ozone precursors.

3.4.3 - GLOBAL CLIMATE CHANGE REGULATORY ISSUES

In 1988, the United Nations established the Intergovernmental Panel on Climate Change to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United Nations Framework Convention on Climate Change established an agreement with the goal of controlling GHG emissions, including methane. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The plan consists of more than 50 voluntary programs. Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. Pursuant to the Montreal Protocol, the production and consumption of compounds that deplete O_3 in the stratosphere (chlorofluorocarbons [CFCs], halons, carbon tetrachloride, and methyl chloroform) were phased out by 2000 (methyl chloroform was phased out by 2005).

On September 27, 2006, Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006 (the Act), was enacted by the State of California. The legislature stated, "Global

warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." The Act caps California's GHG emissions at 1990 levels by 2020. The Act defines GHG emissions as all of the following gases: carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. This agreement represents the first enforceable statewide program in the U.S. to cap all GHG emissions from major industries that include penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce GHG emissions in California and from power generation facilities located outside the State that serve California residents and businesses. According to CARB, California has met its 2020 GHG emission reduction target (CARB, 2021).

Subsequent legislation by the California legislature has included Senate Bill (SB) 32, which expanded on AB 32 to reduce GHG emissions to 40 percent below the 1990 levels by 2030; AB 197, which increased the legislative oversight of the CARB by adding two legislatively appointed non-voting members to the CARB Board and provided additional protection to disadvantaged communities; SB 350, which increased California's renewable energy electricity procurement goal; and SB 100, which established a landmark policy requiring renewable energy and zero-carbon resources to supply 100 percent of electrical retail sales to end-use customers and 100 percent of electricity procured to serve State agencies by 2045.

Global warming and climate change have received substantial public attention for more than 20 years. For example, the United States Global Change Research Program was established by the Global Change Research Act of 1990 to enhance the understanding of natural and human-induced changes in the Earth's global environmental system, to monitor, understand, and predict global change, and to provide a sound scientific basis for national and international decision-making. Even so, the analytical tools have not been developed to determine the effect on global warming from a particular increase in GHG emissions, or the resulting effects on climate change in a particular locale. The scientific tools needed to evaluate the impacts that a specific project may have on the environment are even further in the future.

The California Supreme Court's most recent CEQA decision on the Newhall Ranch development case, Center for Biological v. California Department of Fish and Wildlife (November 30, 2015, Case No. 217763), determined that the project's Environmental Impact Report (EIR) did not substantiate the conclusion that the GHG cumulative impacts would be less than significant. The EIR determined that the Newhall Ranch development project would reduce GHG emissions by 31 percent from business as usual (BAU). This reduction was compared to California's target of reducing GHG emissions statewide by 29 percent from business as usual. The Court determined that "the EIR's deficiency stems from taking a quantitative comparison method developed by the Scoping Plan as a measure of the greenhouse gas reduction effort required by the State as a whole, and attempting to use that method, without adjustments, for a purpose very different from its original design." In the Court's final ruling, it offered suggestions that were deemed appropriate use of the BAU methodology:

1. Lead agencies can use the comparison to BAU methodology if they determine what reduction a particular project must achieve in order to comply with statewide goals.
2. Project design features that comply with regulations to reduce emissions may demonstrate that those components of emissions are less than significant.
3. Lead agencies could also demonstrate compliance with locally adopted climate plans or apply specific numerical thresholds developed by some local agencies.

In the event that a local air district's guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency's discretion, a neighboring air district's GHG threshold may be used to determine impacts. On April 20, 2022, the Bay Area Air Quality Management District (BAAQMD) adopted new Project Level Climate Impact Thresholds of Significance which rely upon necessary design elements to achieve California's long-term climate goal of carbon neutrality by 2045. Chapter 3 of BAAQMD's 2022 CEQA Guidelines indicates that a land use project will have less than significant impact related to operational GHG emissions if it includes the following project design elements:

- Buildings
    - The project will not include natural gas appliances or natural gas plumbing.
    - The project will not result in any wasteful, inefficient, or unnecessary energy use as determined by the analysis under CEQA Section 21100(b)(3) and Section 15126.2 (b) of the State CEQA Guidelines.
- Transportation
    - The project will achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan or meet a locally adopted Senate Bill 743 VMT target that reflects the recommendation provided in the Governor's Office Planning and Research's Technical Advisory on Evaluation Transportation Impacts in CEQA.
    - The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

The City has recommended use of the BAAQMD's GHG significance threshold for determining GHG impacts from residential projects. The VMT threshold target in the City is 13% of the average County VMT per capita that results in less than 14.01 VMT.

SECTION 4 - IMPACT ASSESSMENT

4.1 - Significance Criteria

To determine whether a proposed Project could create a potential CEQA impact, local, State, and federal agencies have developed various means by which a project's impacts may be measured and evaluated. Such means can generally be categorized as follows:

- Thresholds of significance adopted by air quality agencies to guide lead agencies in their evaluation of air quality impacts under the CEQA.
- Regulations established by air districts, CARB, and EPA for the evaluation of stationary sources when applying for Authorities to Construct, Permits to Operate, and other permit program requirements (e.g., New Source Review).
- Thresholds utilized to determine if a project would cause or contribute significantly to violations of the ambient air quality standards or other concentration-based limits.
- Regulations applied in areas where severe air quality problems exist.

Below are summary tables of these emission-based and concentration-based thresholds of significance for each pollutant, along with a discussion of their applicability.

4.1.1 - THRESHOLDS ADOPTED FOR THE EVALUATION OF AIR QUALITY IMPACTS UNDER CEQA

In order to maintain consistency with CEQA, the SJVAPCD (2015) adopted guidelines to assist applicants in complying with the various requirements. According to the SJVAPCD's GAMAQI, a project would have potentially significant air quality impacts when the project:

- Creates a conflict with or obstructs implementation of the applicable air quality plan.
- Causes a violation of any air quality standard or generates substantial contribution towards exceeding an existing or projected air quality standard.
- Results in a cumulatively considerable net increase of any criteria pollutant for which the project region is designated non-attainment under a NAAQS and CAAQS (including emissions that exceed quantitative thresholds for O_3 precursors).
- Exposes sensitive receptors to substantial pollutant concentrations.
- Creates objectionable odors that affect a substantial number of people.

The SJVAPCD GAMAQI thresholds are designed to implement the general criteria for air quality emissions as required in the CEQA Guidelines, Appendix G, Paragraph III (Title 14 of the California Code of Regulations §15064.7) and CEQA (California Public Resources Code Sections 21000 et al.). SJVAPCD's specific CEQA air quality thresholds are presented in Table 4-1.

Table 4-1
SJVAPCD CEQA Thresholds of Significance

Criteria Pollutant	Construction Emissions	Operational Emissions Permitted Equipment and Activities	Operational Emissions Non-Permitted Equipment and Activities
NOx	10 tons/yr	10 tons/yr	10 tons/yr
ROG	10 tons/yr	10 tons/yr	10 tons/yr
SOx	27 tons/yr	27 tons/yr	27 tons/yr
PM_{10}	15 tons/yr	15 tons/yr	15 tons/yr
$PM_{2.5}$	15 tons/yr	15 tons/yr	15 tons/yr
CO	100 tons/yr	100 tons/yr	100 tons/yr

Source: SJVAPCD, 2015.

4.1.2 - THRESHOLD FOR AMBIENT AIR QUALITY IMPACTS

CEQA Guidelines – Appendix G (Environmental Checklist) states that a project that would "*violate any air quality standard or contribute substantially to an existing or projected air quality violation*" would be considered to create significant impacts on air quality. Therefore, an AQIA should determine whether the emissions from a project would cause or contribute significantly to violations of the NAAQS or CAAQS (presented above in Table 3-1) when added to existing ambient concentrations.

The EPA has established the federal Prevention of Significant Deterioration (PSD) program to determine what comprises "significant impact levels" (SIL) to NAAQS attainment areas. A project's impacts are considered less than significant if emissions are below PSD SIL for a particular pollutant. When a SIL is exceeded, an additional "increment analysis" is required. As the Project would not include modification to the stationary source under New Source Review (NSR), it would not be subject to either PSD or NSR review. The PSD SIL thresholds are used with ambient air quality modeling for a CEQA project to address whether the project would "*violate any air quality standard or contribute substantially to an existing or projected air quality violation*." Ambient air quality emissions estimates below the PSD SIL thresholds would result in less-than-significant ambient air quality impacts on both a project and cumulative CEQA impact analysis. The SJVAB is classified as non-attainment/marginal for the 8-hour O_3 NAAQS and, as such, is subject to non-attainment NSR. PSD SILs and increments are more stringent than the CAAQS or NAAQS and represent the most stringent thresholds of significance.

4.1.3 - THRESHOLDS FOR HAZARDOUS AIR POLLUTANTS

The SJVAPCD's GAMAQI states, "From a health risk perspective, there are basically two types of land use projects that have the potential to cause long-term public health risk impacts:

- Type A Projects: Land use projects that will place new toxic sources in the vicinity of existing receptors.

- Type B Projects: Land use projects that will place new receptors in the vicinity of existing toxic sources" (SJVAPCD, 2015).

Table 4-2 presents the thresholds of significance used with toxic air contaminants when evaluating hazardous air pollutants (HAPs).

Table 4-2
Measures of Significance – Toxic Air Contaminants

Agency	Level	Description
Significance Thresholds Adopted for the Evaluation of Impacts Under CEQA		
SJVAPCD	Carcinogens	Maximally Exposed Individual risk **equals or exceeds** 20 in one million.
	Non-Carcinogens	**Acute**: Hazard Index **equals or exceeds** 1.0 for the Maximally Exposed Individual. **Chronic**: Hazard Index **equals or exceeds** 1.0 for the Maximally Exposed Individual.

Source: EKAPCD, 1996

4.1.4 - GLOBAL CLIMATE CHANGE THRESHOLDS OF SIGNIFICANCE

On December 17, 2009, SJVAPCD adopted Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD, 2009); which outlined the SJVAPCD's methodology for assessing a project's significance for GHGs under CEQA. The following criteria were outlined in the document to determine whether a project could have a significant impact:

- Projects determined to be exempt from the requirements of CEQA would be determined to have a less-than-significant individual and cumulative impact for GHG emissions and would not require further environmental review, including analysis of project-specific GHG emissions. Projects exempt under CEQA would be evaluated consistent with established rules and regulations governing project approval and would not be required to implement BPS.
- Projects complying with an approved GHG emission reduction plan or GHG mitigation program that avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less-than-significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA-compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement BPS.
- Projects implementing Best Performance Standards would not require quantification of project-specific GHG emissions. Consistent with CEQA Guidelines, such projects would be determined to have a less-than-significant individual and cumulative impact for GHG emissions.

- Projects not implementing Best Performance Standards would require quantification of project-specific GHG emissions and demonstration that project-specific GHG emissions would be reduced or mitigated by at least 29 percent, compared to business as usual (BAU), including GHG emission reductions achieved since the 2002-2004 baseline period. Projects achieving at least a 29 percent GHG emission reduction compared to BAU would be determined to have a less-than-significant individual and cumulative impact for GHG.
- Notwithstanding any of the above provisions, projects requiring the preparation of an Environmental Impact Report for any other reason would require quantification of project-specific GHG emissions. Projects implementing BPS or achieving at least a 29 percent GHG emission reduction compared to BAU would be determined to have a less-than-significant individual and cumulative impact for GHG.

The SJVAPCD, a CEQA Trustee Agency for this Project, has developed thresholds to determine the significance of a proposed project – either implement Best Performance Standards or achieve a 29 percent reduction from BAU (a specific numerical threshold). However, the SJVAPCD has established their BAU and baseline emissions based on the years 2002-2004 and 2020, respectively. The 2020 projected baseline has passed, and at this time, no new guidance has been approved for determining BAU and projected baseline for the next target year.

On April 20, 2022, the Bay Area Air Quality Management District (BAAQMD) adopted new Project Level Climate Impact Thresholds of Significance which rely upon necessary design elements to achieve California's long-term climate goal of carbon neutrality by 2045. Chapter 3 of BAAQMD's 2022 CEQA Guidelines indicates that a land use project will have less than significant impact related to operational GHG emissions if it includes the following project design elements:

- Buildings
    - The project will not include natural gas appliances or natural gas plumbing.
    - The project will not result in any wasteful, inefficient, or unnecessary energy use as determined by the analysis under CEQA Section 21100(b)(3) and Section 15126.2 (b) of the State CEQA Guidelines.

- Transportation
    - The project will achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan or meet a locally adopted Senate Bill 743 VMT target that reflects the recommendation provided in the Governor's Office Planning and Research's Technical Advisory on Evaluation Transportation Impacts in CEQA.
    - The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

The City has recommended use of the BAAQMD's GHG significance threshold for determining GHG impacts from residential projects. The VMT threshold target in the City is 13% of the average County VMT per capita, which results in less than 14.01 VMT.

4.2 - Project Related Emissions

This document was prepared pursuant to the SJVAPCD's GAMAQI. The GAMAQI identifies separate thresholds for a project's short-term (construction) and long-term (operational) emissions.

Project emissions were estimated separately for each emission source. The California Emissions Estimator Model (CalEEMod) was used to estimate emissions for both short-term, construction-related sources and long-term, operations-related sources.

Project emissions were estimated for the following development stages:

- Short-term (Construction and Demolition) – Construction emissions of the proposed Project were estimated in CalEEMod using the anticipated construction schedule and default construction equipment for the development. (See Appendix A.)
- Long-term (Operations) – Long-term emissions were also estimated in CalEEMod using model defaults for operations of the aforementioned land use types. (See Appendix A.)

4.2.1 - SHORT-TERM EMISSIONS

Short-term emissions from the construction phases of a project would have temporary impacts on air quality.

The construction emissions were based on the default CalEEMod equipment list for the proposed Project's land use type and development intensity and applying model defaults as well as a conservative analysis approach. Construction emissions were estimated under the assumption that construction would begin Quarter 3 of 2026. The dates entered into the CalEEMod program represent the earliest construction timeline, which would estimate the worst-case emissions as construction equipment technology and emissions improve over time; therefore, all estimated emission totals are conservative and reflect a reasonable and legally sufficient estimate of potential impacts. All construction equipment activity levels assumed were based on CalEEMod default values for type, number of equipment, hours per day and horsepower.

Adjustments to the CalEEMod default values were as follows:

- Land use lot acreage was adjusted to match the Project description.
- Construction schedule was adjusted to match anticipated construction dates.
- Demolition construction phase was removed as the Project Location is open land.

SJVAPCD's required measures for all projects were also applied:

- Water exposed area three times per day.
- Reduce vehicle speed to less than 15 miles per hour on unpaved roads.

Table 4-3 presents the Project's short-term emissions based on the anticipated construction period.

As calculated with CalEEMod, the estimated short-term construction-related emissions would not exceed SJVAPCD significance threshold levels during any given year and would, therefore, be *less than significant*.

Table 4-3
Short-Term Project Emissions

Emissions Source	Pollutant (tons/year)					
	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction 2026	0.125	1.084	1.184	0.002	0.160	0.091
Construction 2027	0.166	1.296	1.939	0.003	0.100	0.054
Construction 2028	0.791	1.097	1.711	0.003	0.082	0.044
Construction 2029	0.514	0.006	0.011	0.000	0.001	0.000
Significance Threshold	10	10	100	27	15	15
Is Threshold Exceeded for a Single Year After Mitigation?	No	No	No	No	No	No

Source: QK 2025

4.2.2 - LONG-TERM OPERATIONAL EMISSIONS

Long-term emissions are caused by operational mobile sources and area source emissions from the on-site building.

Fugitive Dust Emissions

Operation of the Project site at full build-out is not expected to present a substantial source of fugitive dust (PM_{10}) emissions. The main source of PM_{10} emissions would be from vehicular traffic associated with the Project site.

PM_{10}, on its own as well as in combination with other pollutants, creates a health hazard. SJVAPCD's Regulation VIII establishes required controls to reduce and minimize fugitive dust emissions. The following SJVAPCD Rules and Regulations apply to the proposed Project (and all projects):

- Rule 4102 – Nuisance – prohibits a facility from posing as a nuisance to surrounding receptors and can impose penalties for nuisance issues such as dust, smoke, excess emissions, etc. Compliance with this rule ensures that the area around the Project site will not be adversely impacted by such issues.

- Regulation VIII – Fugitive PM_{10} Prohibitions – a series of regulations to reduce and/or eliminate the generation of particulate matter (PM) that can adversely impact visibility as well as the health and safety of people on-site or in the vicinity of the Project.
    - Rule 8011 – General Requirements – this rule is to reduce ambient concentrations of fine particulate matter (PM_{10}) by requiring actions to prevent, reduce, or mitigate anthropogenic (human-caused) fugitive dust emissions.
    - Rule 8021 – Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities – restricts generation of airborne dust and visibility impacts from these activities. Places limits on opacity and equipment operation under certain adverse weather conditions.
    - Rule 8041 – Carryout and Trackout – requires that equipment and vehicles leaving the construction site control the amount of dirt, soil, or mud that is tracked offsite and onto public roadways. This helps eliminate or minimize dust generation and opacity degradation.
    - Rule 8051 – Open Areas – limits fugitive dust from open areas, i.e., areas on a construction site that are not actively being constructed upon but may generate wind-blown dust.

The Project would comply with applicable SJVAPCD Rules and Regulations, the local zoning codes, and additional emissions reduction measures recommended later in this analysis, in Section 7, Mitigation and Other Recommended Measures.

Exhaust Emissions

Project-related transportation activities from residents would generate mobile source ROG, NOx, SOx, CO, PM_{10}, and $PM_{2.5}$ exhaust emissions. Exhaust emissions would vary substantially from day to day but would average out over the course of an operational year. The variables factored into estimating total Project emissions include level of activity, site characteristics, weather conditions, and number of visitors. As the Project is not expected to generate an adverse change in current activity levels, substantial emissions are not anticipated. The default trip rates in CalEEMod were used along with an adjusted fleet mix to reflect SJVAPCD approved residential fleet mix for year 2026.

Projected Emissions

The proposed Project is expected to have long-term air quality impacts as shown in Table 4-4. Emission calculations are available in Appendix A.

Table 4-4
Post-Project Max Year (Operational Emissions)

Emissions Source	Pollutant (tons/year)					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Mitigated Emissions						
Operational Emissions	2.57	1.18	8.34	0.02	1.60	0.43
SJVAPCD Threshold	10	10	100	27	15	15
Is Threshold Exceeded After Mitigation?	No	No	No	No	No	No

As shown in Table 4-4, operations-related emissions, as calculated in Appendix A, would not exceed the SJVAPCD significant threshold levels. Therefore, the Project is less-than-significant for operational emissions.

4.3 - Potential Impacts on Sensitive Receptors

Sensitive receptors are defined as locations where young children, chronically ill individuals, the elderly, or people who are more sensitive than the general population reside, such as schools, hospitals, nursing homes, and daycare centers. The nearest residential sensitive receptor to the proposed Project is located adjacent to portions of the Project's sites. Table 4-5 lists the known non-residential sensitive receptors within one mile of the Project site. Discussion of health risks and risks to sensitive receptors is addressed in detail below in Section 4.6.

Table 4-5
Sensitive Receptors Located < 1 miles from Project

Receptor	Type of Facility	Distance from Project (miles)	Direction from Project
Brighten Academy Preschool Grantland	Preschool	0.15	North
Harvest Elementary School	School	0.78	South
Herndon-Barstow Elementary School	School	0.76	North
Justin Garza Highschool	School		South
Penny & Bear Family Childcare	Daycare	0.42	East
Loving Hands Care Home	Assisted Living	0.50	East

4.4 - Potential Impacts to Visibility to Nearby Class 1 Areas

Visibility impact analyses are intended for stationary sources of emissions which are subject to the PSD requirements in 40 CFR Part 60; they are not usually conducted for area sources. Under the PSD program, all international parks, national wilderness areas and national memorial parks that exceed 5,000 acres, and of national parks that exceed 6,000 acres are designated as mandatory federal Class I areas which are provided visibility protection under the Clean Air Act. Because the Project's PM10 emissions increases are predicted to be less

than the PSD threshold levels, an impact at any Class 1 area or military/airspace operation within 100 kilometers of the Project is extremely unlikely. Therefore, based on the Project's predicted less-than significant PM10 emissions, the Project would be expected to have a *less than significant impact* to visibility at any Class 1 area or military/airspace operation.

4.5 - Potential Impacts from Carbon Monoxide

Ambient CO concentrations normally correspond closely to the spatial and temporal distributions of vehicular traffic. Relatively high concentrations of CO would be expected along heavily traveled roads and near busy intersections. CO concentrations are also influenced by wind speed and atmospheric mixing. CO concentrations may be more uniformly distributed when inversion conditions are prevalent in the valley. Under certain meteorological conditions, CO concentrations along a congested roadway or intersection may reach unhealthful levels for sensitive receptors, e.g., children, the elderly, hospital patients, etc. This localized impact can result in elevated levels of CO, or "hotspots," even though concentrations at the closest air quality monitoring station may be below NAAQS and CAAQS.

The localized project impacts depend on whether ambient CO levels in the Project vicinity would be above or below NAAQS. If ambient levels are below the standards, a project is considered to have significant impacts if a project's emissions would exceed one or more of these standards. If ambient levels already exceed a State standard, a project's emissions are considered significant if they would increase 1-hour CO concentrations by 10 ppm or more or 8-hour CO concentrations by 0.45 ppm or more. There are two criteria established by the SJVAPCD's GAMAQI by which CO "hotspot" modeling is required:

1. A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity would be reduced to LOS E or F.
2. A traffic study indicates that the project would substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity.

A traffic study was completed for this Project (Peters, 2020). According to the traffic study, impacted intersections and roadway segments are anticipated to operate at a LOS of D or better. Therefore, CO "hotspot" modeling was not conducted for this Project, and no concentrated excessive CO emissions are expected to be caused once the proposed Project is completed.

4.6 - Predicted Health Impacts

GAMAQI recommends that Lead Agencies consider situations wherein a new or modified source of HAPs is proposed for a location near an existing residential area or other sensitive receptors when evaluating potential impacts related to HAPs.

The proposed Project would result in emissions of HAPs from construction activities and would be located near existing residents; therefore, an assessment of the potential risk to the population attributable to emissions of hazardous air pollutants from the proposed Project is required.

To predict the potential health risk to the population attributable to emissions of HAPs from the proposed Project, ambient air concentrations were predicted with dispersion modeling to arrive at a conservative estimate of increased individual carcinogenic risk that might occur as a result of continuous exposure over the construction period for construction emissions. Similarly, predicted concentrations were used to calculate non-cancer chronic and acute hazard indices, which are the ratio of expected exposure to acceptable exposure. The basis for evaluating potential health risks is the identification of sources with increased HAPs. HAP emissions from anticipated on-site construction activities were evaluated.

Health risk is determined using the Hotspots Analysis and Reporting Program (HARP) software distributed by the CARB. HARP2 requires peak 1-hour emission rates and annual-averaged emission rates for all pollutants for each modeling source. The assumptions used to calculate the emission rates for the proposed Project are outlined below.

The most recent version of EPA's AMS/EPA Regulatory Model – AERMOD (recompiled for the Lakes ISC-AERMOD View) was used to predict the dispersion of emissions from the proposed Project. The analysis employed all of the regulatory default AERMOD model keyword parameters, including elevated terrain options.

Diesel combustion emissions from diesel on-site construction equipment were modeled as an area source for on-site construction activity on the property. Diesel particulate matter was calculated using CalEEMod for on-site construction. A unit emission rate of one gram/second (g/sec) was input to AERMOD for each source.

A fenceline discrete receptor grid was placed around the Project site in order to evaluate residences and businesses within close proximity of the Project site. A three-tier grid was used with 25-meter fenceline spacing. The first tier extended 100 meters with 25-meter tier spacing, the second tier extended an additional 200 meters with 50-meter tier spacing and the third tier extended another 400 meters with a tier spacing of 100 meters. A total of 1,351 discrete off-site receptors were analyzed. Elevated terrain options were employed even though there is not complex terrain in the Project area. The 1-deg DEM terrain data for Fresno-W, CA, was processed with AERMAP to identify elevations for the proposed Project.

SJVAPCD-provided AERMET processed meteorological datasets for the Fresno monitoring station, calendar years 2018 through 2022 were input to AERMOD (SJVAPCD, 2025d). This was the most recent available dataset available at the time the modeling was conducted. Rural dispersion parameters were used because the operation and the majority of the land surrounding the facility are considered "rural" under the Auer land use classification method (Auer, 1978).

Plot files generated by AERMOD were uploaded to the Air Dispersion Modeling and Risk Assessment Tool (ADMRT) program in the Hotspots Analysis and Reporting Program Version 2 (HARP2) (CARB, 2015). ADMRT post-processing was used to assess the potential for excess cancer risk and chronic and acute non-cancer effects using the most recent health effects data from the California EPA Office of Environmental Health Hazard Assessment (OEHHA) using the OEHHA Derived Method. HARP2 site parameters were set for the mandatory minimum pathways of inhalation, homegrown gardens, soil ingestion, dermal, and mother's milk. The non-inhalation pathways used a deposition rate of 0.02 m/s along with all other default parameters. Risk reports were generated using the derived OEHHA analysis method for carcinogenic risk and non-carcinogenic chronic and acute risk. Site parameters are included in the HARP2 output files. Total cancer risk was predicted for the inhalation pathway at each receptor. A hazard index was computed for chronic non-cancer health effects for each applicable endpoint and each receptor. A hazard index for acute non-cancer health effects was not computed since DPM does not have a risk exposure level for acute risk.

SJVAPCD has set the level of significance for carcinogenic risk at twenty in one million, which is understood as the possibility of causing 20 additional cancer cases in a population of one million people. The level of significance for chronic non-cancer risk is a hazard index of 1.0. All receptors were modeled with a 3-year exposure for construction activities.

The carcinogenic risk and the health hazard index (HI) for chronic non-cancer risk at the point of maximum impact (PMI) do not exceed the significance levels of 20 in one million (20 x 10-6) and 1.0, respectively, for the proposed Project. The PMIs are identified by receptor location and risk and are provided in Table 4-6. The electronic AERMOD and HARP2 output files are provided in Appendix B.

Table 4-6
Potential Maximum Impacts Predicted by HARP

	Cancer Risk	Chronic Hazard Index
Construction	5.12E-06	2.69E-03
SJVAPCD Threshold	20.0E-06	1.0
Exceedance?	No	No
Receptor #	215	215
UTM Easting (m)	240253.81	240253.81
UTM Northing (m)	4078000.35	4078000.35

Note: UTM = Universal Transverse Mercator

As shown above in Table 4-6, the maximum predicted cancer risk for the proposed Project is 5.12E-06. The maximum chronic non-cancer hazard index for the proposed Project is 2.69E-03. Since the PMI remained below the significance threshold for cancer and chronic risk, this Project would not have an adverse effect to any of the surrounding communities.

The potential health risk attributable to the proposed Project is determined to be *less than significant* based on the following conclusions:

1. Potential carcinogenic risk from the proposed Project is below the significance level of twenty in a million at each of the modeled receptors.
2. The hazard index for the potential chronic non-cancer risk from the proposed Project is below the significance level of 1.0 at each of the modeled receptors.
3. The hazard index for the potential acute non-cancer risk was not calculated since there is no acute risk associated with DPM emission; therefore, the proposed Project is considered below the significance level.

Therefore, potential risk to the population attributable to emissions of HAPs from the proposed Project would be less than significant.

4.7 - Potential Impacts from Valley Fever

The proposed project has the potential to generate fugitive dust and suspend Valley Fever spores with the dust that could then reach nearby sensitive receptors. It is possible that onsite workers could be exposed to Valley Fever spores as fugitive dust is generated during construction. In order to mitigate potential risk, the proposed Project would provide training and personal protective respiratory equipment to construction workers and provide information to all construction personnel and visitors about Valley Fever. Therefore, the exposure to Valley Fever would be minimized. With the implementation of the mitigation measures, dust from the construction of the proposed project would not add significantly to the existing exposure level of people to this fungus, including construction workers, and impacts would be reduced to less-than-significant levels.

4.8 - Potential Impacts from Asbestos

Naturally occurring asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released into the atmosphere due to vehicular traffic on unpaved roads, during the grading of development projects, and at mining operations.

Serpentinite and/or ultramafic rocks are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the counties associated with the Sierra Nevada foothills, the Klamath Mountains, and the Coast Ranges. However, according to information provided by the Department of Conservation Division of Mines and Geology, the project site is not located in an area where naturally occurring asbestos is likely to be present (CDCDMG, 2025). Therefore, impacts associated with the exposure of construction workers and nearby sensitive receptors to asbestos would be less than significant.

4.9 - Odor Impacts and Mitigation

The SJVAPCD's GAMAQI states, "An analysis of potential odor impacts should be conducted for both of the following two situations:

1. Generators – projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate.
2. Receivers – residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources" (SJVAPCD, 2015).

The GAMAQI also states, "The District has identified some common types of facilities that have been known to produce odors in the San Joaquin Valley Air Basin. These are presented in Table 6 (Screening Levels for Potential Odor Sources), along with a reasonable distance from the source within which the degree of odors could possibly be significant. [Table 6] can be used as a screening tool to qualitatively assess a project's potential to adversely affect area receptors" (SJVAPCD, 2015). Because the Project's anticipated land uses and activities are not listed in Table 6 of the GAMAQI as a source that would create objectionable odors, the Project is not expected to be a source of objectionable odors.

Based on the provisions of the SJVAPCD's GAMAQI, the proposed Project would not exceed any screening trigger levels to be considered a source of objectionable odors or odorous compounds (SJVAPCD, 2015). Furthermore, there does not appear to be any significant source of objectionable odors in close proximity that may adversely impact the Project site when it is in operation. Additionally, the Project emissions estimates indicate that it would not be expected to adversely impact surrounding receptors. As such, the proposed Project would not be a source of any odorous compounds, nor would it likely be impacted by any odorous source.

4.10 - Impacts to Ambient Air Quality

As stated in the GAMAQI (2015, pp 96-97), SJVAPCD has developed screening levels that require an Ambient Air Quality Analysis (AAQA). The SJVAPCD recommends that an AAQA be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project construction or operational activities exceed the 100 pounds per day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures.

Average daily emissions for construction and operational activities associated with this Project would not exceed 100 pounds per day. Therefore, an AAQA is not required for this Project.

4.11 - Impacts to Greenhouse Gases and Climate Change

The proposed Project's construction and operational GHG emissions were estimated using the CalEEMod. The Project's GHG emissions are primarily from mobile source activities. Not

all GHGs exhibit the same ability to induce climate change; as a result, GHG contributions are commonly quantified as CO_2e. Table 4-7 presents the Project's annual GHG emissions.

Table 4-7
Estimated Annual GHG Emissions (MT/Year)

Source	CO_2e
Total Construction Emissions	904
Annualized Construction Emissions[1]	30
Total Operational Emissions	2,215
Total Project Emissions	**2,245**

1 Per South Coast AQMD's Methodology

In the decade after SJVAPCD adopted their Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA, several new laws and executive orders were adopted that require additional reductions in years after 2020. For instance, Senate Bill 32 requires that GHG emissions be 40 percent less than 1990 levels by 2030. More drastic still, Senate Bill 100, which was signed by the Governor recently, requires 100 percent zero-carbon electricity by 2045. On the day SB 100 was signed into law, the Governor also signed Executive Order B-55-18, which commits California to total, economy-wide carbon neutrality by 2045. Clearly, the 2009 Guidance may be somewhat inadequate in producing a meaningful comparison by today's standards, which propose a grand vision that, if achieved, would fundamentally change how business is conducted and citizens live in the State. Thus, as discussed in the most recent updates to the Scoping Plan, the objectives of the Scoping Plan affect entire sectors of the economy, and it no longer makes sense to evaluate GHG emissions on a project level.

For these reasons, Project GHG emissions levels presented in Table 4-7 are primarily for disclosure purposes. The City has recommended use of the BAAQMD's GHG significance threshold for determining GHG impacts from residential projects. Chapter 3 of BAAQMD's 2022 CEQA Guidelines indicates that a land use project will have less than significant impact related to operational GHG emissions if it includes the following project design elements:

- Buildings
    - The project will not include natural gas appliances or natural gas plumbing.
    - The project will not result in any wasteful, inefficient, or unnecessary energy use as determined by the analysis under CEQA Section 21100(b)(3) and Section 15126.2 (b) of the State CEQA Guidelines.
- Transportation
    - The project will achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan or meet a locally adopted Senate Bill 743 VMT target that reflects the recommendation

provided in the Governor's Office Planning and Research's Technical Advisory on Evaluation Transportation Impacts in CEQA.

- The VMT threshold target in the City of Fresno is 13% of the average County VMT per capita which results in less than 14.01 VMT

- The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

The development of the Project will not include natural gas appliances or natural gas plumbing per Project representatives. In addition, the proposed Project will use energy-efficient materials, modern construction practices, and new appliances, following Appliance Efficiency Regulations (Title 20, California Code of Regulations {CCR} Sections 1601-1608). Energy Consumption during construction and operation will align with typical residential usage but will vary based on personal choices and building design. The Project, located in an urban area and residential land use under the Fresno General Plan, will comply with the City's energy efficiency policies (General Plan Policies RC-8-a through RC-8-k), ensuring it does not result in wasteful or inefficient energy consumption. The Project is also subject to CCR, Title 24 building standards which would improve the Project's energy efficiency and consumption. The Title 24 California Building Standards Code is a wide-ranging set of requirements for energy conservation and green design that apply to the structural, mechanical, electrical, and plumbing systems in a building.

The Fresno City Council adopted the CEQA Guidelines for Vehicles Miles Traveled (VMT) on June 25, 2020, which establishes the City's threshold of significance for CEQA transportation studies as it relates to VMT. In addition, Fresno COG's Fresno County SB 743 Implementation Technical Report (March 2021) also establishes threshold of significance for CEQA transportation studies as it relates to VMT. Both documents indicate that projects that generate a low volume of daily traffic are presumed to create a less than significant impact on VMT and GHG emissions. As noted above, the VMT threshold target in the City is 13% of the average County VMT per capita, which results in less than 14.01 VMT.

Fresno COG has developed a VMT screening map as a first step for determining applicability for further VMT analysis. According to the VMT screening map the Project's parcel has an average VMT per capita of 13.65 which is less than the City's VMT per capita threshold of 14.01. Therefore, based on the information outlined above, the Project is considered less than significant for GHG impacts.

SECTION 5 - CUMULATIVE IMPACTS

By its very nature, air pollution has a cumulative impact. The District's non-attainment status is a result of past and present development within the SJVAB. Furthermore, attainment of ambient air quality standards can be jeopardized by increasing emissions-generating activities in the region. No single project would be sufficient in size by itself to result in non-attainment of the regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development within the San Joaquin Valley Air Basin. When assessing whether there is a new significant cumulative effect, the Lead Agency shall consider whether the incremental effects of the project are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects [CCR §15064(h)(1)]. Per CEQA Guidelines §15064(h)(3), a Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (SJVAPCD, 2015).

GAMAQI also states, "If a project is significant based on the thresholds of significance for criteria pollutants, then it is also cumulatively significant. This does not imply that if the project is below all such significance thresholds, it cannot be cumulatively significant." (SJVAPCD, 2015). Based on the analysis conducted for this Project, it is individually less than significant. This AQIA, however, also considered the impacts of the proposed Project in conjunction with the impacts of other projects previously proposed in the area. The following cumulative impacts were considered:

- Cumulative O_3 Impacts (ROG and NOx) from numerous sources within the region, including transport from outside the region. O_3 is formed through chemical reactions of ROG and NOx in the presence of sunlight.
- Cumulative CO Impacts produced primarily by vehicular emissions.
- Cumulative PM_{10} Impacts from within the region and locally from the various projects. Such projects may cumulatively produce a significant amount of PM10 if several projects conduct grading or earthmoving activities at the same time; and
- Hazardous Air Pollutant (HAP) Impacts on sensitive receptors.

5.1 - Cumulative Regional Air Quality Impacts

The most recent, certified SJVAB Emission Inventory data available from the SJVAPCD is based on data gathered for the 2024 annual inventory. This data will be used to assist the SJVAPCD in demonstrating attainment of Federal 1-hour O_3 Standards. Table 5-1 provides a comparative look at the impacts proposed by the proposed Project to the SJVAB Emissions Inventory.

Table 5-1
Comparative Analysis Based on SJVAB 2024 Inventory

Emissions Inventory Source	Pollutant (tons/year)					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Fresno County – 2024[2]	21,698.52	11,242.00	54,483.19	553.34	24,252.06	6,059.00
SJVAB – 2024[2]	108,775.1	51,926.7	215,561.3	2,265.2	97,564.5	23,861.1
Proposed Project	2.57	1.18	8.34	0.02	1.60	0.43
Proposed Project's % of Fresno[1]	0.0118%	0.0105%	0.0153%	0.0036%	0.0066%	0.0071%
Proposed Project's % of SJVAB[1]	0.0024%	0.0023%	0.0039%	0.0009%	0.0016%	0.0018%

Source: CARB, 2025
Notes: 1) Percentages equaling 0.0000 could represent a percent <0.00005.
2) This is the latest inventory available as of November 2025, excluding Natural Sources.

As shown in Table 5-1 the proposed Project does not pose a substantial increase to basin emissions, as such basin emissions would be essentially the same if the Project is approved.

Table 5-2, Table 5-3, and Table 5-4 provide CARB Emissions Inventory projections for the year 2030 for both the SJVAB and the Fresno County portion of the air basin. Looking at the SJVAB Emissions predicted by the CARB year 2030 emissions inventory, the Fresno County portion of the air basin is a moderate source of the emissions. The proposed Project produces a small portion of the total emissions in both Fresno County and the entire SJVAB.

Table 5-2
Emission Inventory SJVAB 2030 Projection – Tons per Year

	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Total Emissions	104,380.5	38,036.3	168,950.5	2,208.6	99,271.2	21,758.7
Percent Stationary Sources	29.98%	15.51%	4.43%	78.83%	4.30%	11.34%
Percent Area-Wide Sources	55.76%	6.01%	27.47%	8.59%	91.44%	76.99%
Percent Mobile Sources	14.26%	78.48%	74.09%	12.58%	4.26%	11.66%
Total Stationary Source Emissions	31,297.7	5,897.7	7,489.8	1,741.1	4,266.9	2,468.5
Total Area-Wide Source Emissions	58,202.9	2,285.6	36,279.9	189.8	90,775.5	16,752.8
Total Mobile Source Emissions	14,880.3	29,852.6	125,181.1	277.8	4,228.9	2,537.5

Source: CARB, 2025
Note: Total may not add due to rounding.

Table 5-3
Emission Inventory Fresno County 2030 Projection – Tons per Year

	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Total Emissions	20,463.36	7,796.40	40,658.81	547.87	24,306.81	5,277.54
Percent Stationary Sources	34.58%	16.47%	2.97%	77.81%	2.82%	6.89%
Percent Area-Wide Sources	49.70%	7.60%	28.34%	10.33%	93.58%	84.31%
Percent Mobile Sources	15.72%	75.93%	68.69%	11.86%	3.60%	8.80%
Total Stationary Source Emissions	7,076.25	1,283.70	1,206.69	426.32	687.66	363.54
Total Area-Wide Source Emissions	10,170.73	592.76	11,524.14	56.58	22,746.07	4,449.72
Total Mobile Source Emissions	3,216.38	5,919.94	27,927.98	64.97	873.08	464.28

Source: CARB, 2025
Note: Total may not add due to rounding.

Table 5-4
2030 Emissions Projections – Proposed Project, Fresno County and SJVAB

	ROG	NO_X	PM_{10}
Proposed Project	2.57	1.18	1.60
Fresno County	20,463.36	7,796.40	24,306.81
SJVAB	104,380.5	38,036.3	99,271.2
Proposed Project Percent of Fresno County	0.013%	0.015%	0.007%
Proposed Project Percent of SJVAB	0.002%	0.003%	0.002%
Fresno County Percent of SJVAB	19.60%	20.50%	24.49%

As shown above, the proposed Project would pose an inconsequential impact on regional O_3 and PM_{10} formation. Therefore, this Project would not be considered cumulatively considerable in its contribution to regional O_3 and PM_{10} impacts.

5.2 - Cumulative Local Air Quality Impacts

SJVAPCD uses a single threshold for the determination of significance for both project-specific and cumulative impacts. Air quality in SJVAB has improved over the past decades, as shown in Section 3.3, which indicates that the single threshold is sufficient for assessing cumulative impacts. The proposed Project would generate less-than-significant impacts to criteria air pollutants; therefore, the Project's incremental contribution to cumulative air quality impacts would not be cumulatively considerable (CEQA Guidelines Section 15064(h)(3); (SJVAPCD, 2015).

5.3 - Cumulative Hazardous Air Pollutants

The GAMAQI also states that when evaluating potential impacts related to HAPs, "*impacts of local pollutants (CO, HAPs) are cumulatively significant when modeling shows that the combined emissions from the project and other existing and planned projects will exceed air quality standards*." Because the Project would not be a significant source of HAPs, the proposed Project would also *not be expected to pose a significant cumulative CO or HAPs impact*.

5.4 - Cumulative Carbon Monoxide (CO) – Mobile Sources

The SJVAPCD's GAMAQI has identified CO impacts from impacted traffic intersections and roadway segments as being potentially cumulatively considerable. Traffic increases and added congestion caused by a project can combine to cause a violation of the SJVAPCD's CO standard, also known as a "hotspot." There are two criteria established by the GAMAQI by which CO "hotspot" modeling is required:

1. A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity would be reduced to LOS E or F.

2. A traffic study indicates that the project would substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity.

A Traffic study was completed for this Project (Peters, 2020). According to the traffic study, impacted intersections and roadway segments are anticipated to operate at a LOS of D or better. Therefore, CO "hotspot" modeling was not conducted for this Project, and no concentrated excessive CO emissions are expected to be caused once the proposed Project is completed.

SECTION 6 - CONSISTENCY WITH THE AIR QUALITY ATTAINMENT PLAN

Air quality impacts from proposed projects within Fresno County are controlled through policies and provisions of the SJVAPCD and the Fresno County General Plan (FCPLU, 2024). In order to demonstrate that a proposed project would not cause further air quality degradation in either the SJVAPCD's plan to improve air quality within the air basin or the federal requirements to meet certain air quality compliance goals, each project should also demonstrate consistency with the SJVAPCD's adopted Air Quality Attainment Plans (AQAP) for O_3 and PM_{10}. The SJVAPCD is required to submit a "Rate of Progress" document to CARB that demonstrates past and planned progress toward reaching attainment for all criteria pollutants. The California Clean Air Act (CCAA) requires air pollution control districts with severe or extreme air quality problems to provide for a five percent reduction in non-attainment emissions per year. The AQAP prepared for the San Joaquin Valley by the SJVAPCD complies with this requirement. CARB reviews, approves, or amends the document and forwards the plan to the EPA for final review and approval within the SIP.

Air pollution sources associated with stationary sources are regulated through the permitting authority of the SJVAPCD under the New and Modified Stationary Source Review Rule (SJVAPCD Rule 2201). Owners of any new or modified equipment that emits, reduces, or controls air contaminants, except those specifically exempted by the SJVAPCD, are required to apply for an Authority to Construct and Permit to Operate (SJVAPCD Rule 2010). Additionally, best available control technology (BACT) is required on specific types of stationary equipment and is required to offset both stationary source emission increases along with increases in cargo carrier emissions if the specified threshold levels are exceeded (SJVAPCD Rule 2201, 4.7.1). Through this mechanism, the SJVAPCD would ensure that all stationary sources within the project area would be subject to the standards of the SJVAPCD to ensure that new developments do not result in net increases in stationary sources of criteria air pollutants.

6.1 - Required Evaluation Guidelines

CEQA Guidelines and the Federal Clean Air Act (Sections 176 and 316) contain specific references on the need to evaluate consistency between a proposed project and the applicable AQAP for the Project site. To accomplish this, CARB has developed a three-step approach to determine project conformity with the applicable AQAP:

1. Determination that an AQAP is being implemented in the area where the project is being proposed. The SJVAPCD has implemented the current, modified AQAP as approved by CARB.
2. The proposed project must be consistent with the growth assumptions of the applicable AQAP. The proposed Project is included in the residential increases projected in the Fresno County General Plan.
3. The project must contain in its design all reasonably available and feasible air quality control measures. The proposed Project incorporates various policy and rule-required implementation measures that will reduce related emissions.

The CCAA and AQAP identify transportation control measures as methods to further reduce emissions from mobile sources. Strategies identified to reduce vehicular emissions such as reductions in vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, and traffic congestion, in order to reduce vehicular emissions, can be implemented as control measures under the CCAA as well. Additional measures may also be implemented through the building process, such as providing electrical outlets on exterior walls of structures to encourage the use of electrical landscape maintenance equipment or measures such as electrical outlets for electrical systems on diesel trucks to reduce or eliminate idling time.

As the growth represented by the proposed Project was anticipated by the Fresno County General Plan and incorporated into the AQAP, conclusions may be drawn from the following criteria:

1. That, by definition, the proposed emissions from the Project are below the SJVAPCD's established emissions impact thresholds.
2. That the primary source of emissions from the Project would be motor vehicles which would be licensed through the State of California and whose emissions are already incorporated into the CARB's Fresno County's Emissions Inventory.

Based on these factors, the Project *is consistent with the AQAP*.

6.2 - Consistency with the Fresno Council of Government's Regional Conformity Analysis

The Fresno Council of Governments (Fresno COG) Conformity Analysis Determination demonstrates that the federal and regional transportation plans in Fresno County portion of the San Joaquin Valley air quality attainment areas would not hinder the efforts set out in the CARB's SIP for each area's non-attainment pollutants (CO, O_3, and PM_{10}). The analysis uses an adopted regional growth forecast prepared by Applied Development Economics (ADE) which was commissioned by Fresno COG to update these forecasts.

The Fresno COG Regional Conformity Analysis considers General Plan Amendments (GPA) and zone changes that were enacted at the time of the analysis as projected growth within the area based on land use designations incorporated within the Fresno County General Plan. Land use designations that are altered based on subsequent GPAs that were not included in the Regional Conformity Analysis were not incorporated into the Fresno COG analysis. Consequently, if a proposed project is not included in the regional growth forecast using the latest planning assumptions, it may not be said to conform to the regional growth forecast.

Under the current West Area Neighborhoods Specific Plan Zoning, the subject property has a land use designation of Residential Medium Density (5.0-12 D.U./acre) and is zoned RS-5 (Residential Single-Family, Medium Density) (see Figure 6-1). Under current policies, only after a GPA is approved, can housing and employment assumptions be updated to reflect the capacity changes. The proposed development does not require a zone change; therefore, the existing growth forecast will not require a modification.

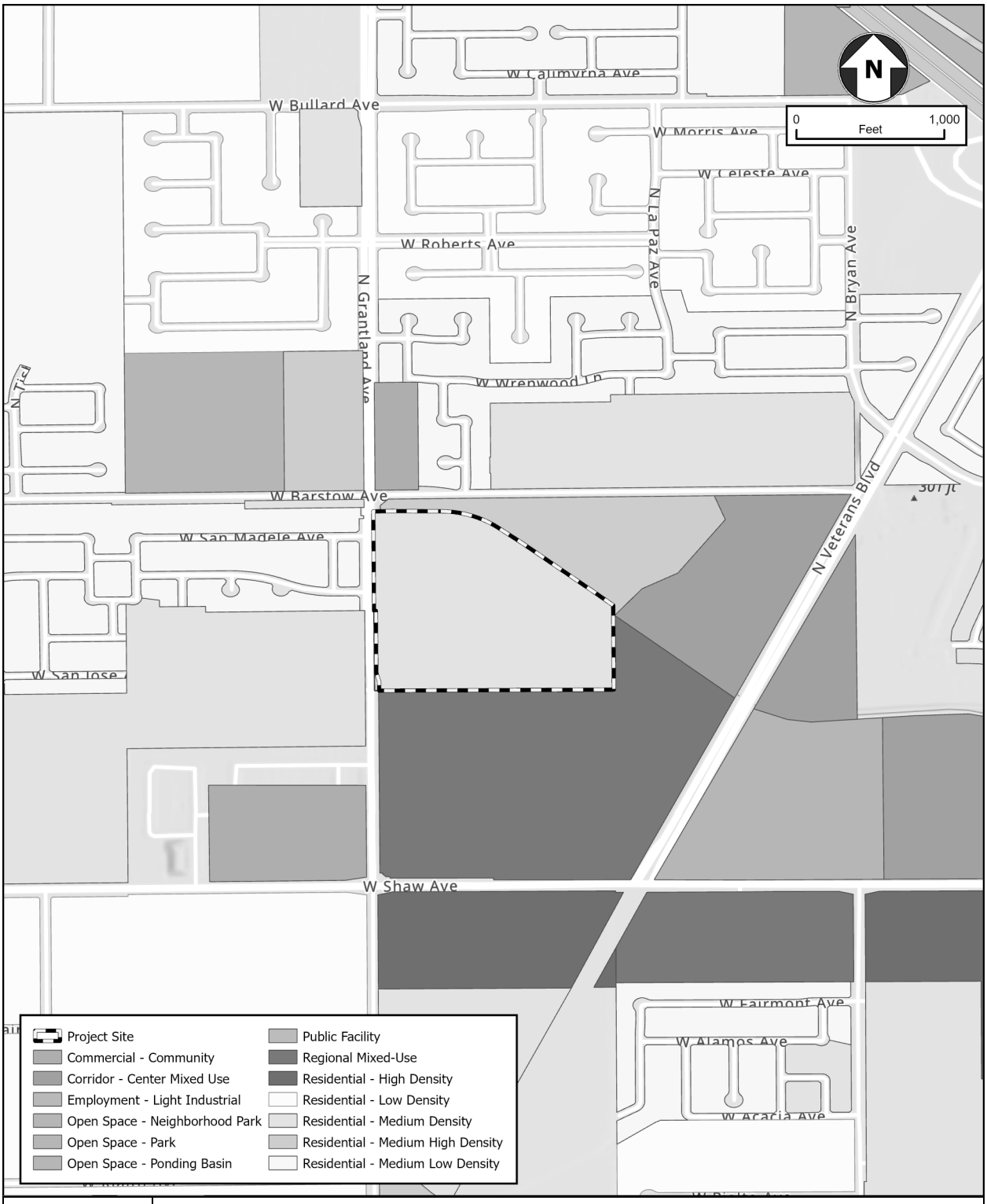


Figure 6-1
West Area Neighborhoods Specific Plan Zoning

SECTION 7 - MITIGATION AND OTHER RECOMMENDED MEASURES

The estimated construction and operational emissions from the proposed Project would be less than significant after the specific mitigation measures listed below. However, to ensure that the Project is in compliance with all applicable SJVAPCD rules and regulations and that emissions are further reduced, the applicant should implement and comply with a number of measures that are either recommended as a "good operating practice" for environmental stewardship, or they are required by regulation. Some of the listed measures are regulatory requirements or construction requirements that would result in further emission reductions through their inclusion in Project construction and long-term design. The following measures either have been applied to the Project through the CalEEMod model and would be incorporated into the Project by design or would be implemented in conjunction with SJVAPCD rules as conditions of approval.

7.1 - Applicable PM_{10} Reduction Measures

As the Project would be completed in compliance with SJVAPCD Regulation VIII, dust control measures would be taken to ensure compliance, specifically during the grading and construction phases. The required Regulation VIII measures are as follows:

- Water previously exposed surfaces (soil) whenever visible dust is capable of drifting from the site or approaches 20 percent opacity.
- Water all unpaved haul roads a minimum of three times/day or whenever visible dust from such roads is capable of drifting from the site or approaches 20 percent opacity.
- Reduce speed on unpaved roads to less than 15 miles per hour.
- Install and maintain a track-out control device that meets the specifications of SJVAPCD Rule 8041 if the site exceeds 150 vehicle trips per day or more than 20 vehicle trips per day by vehicles with three or more axles.
- Stabilize all disturbed areas, including storage piles, which are not being actively utilized for production purposes using water, chemical stabilizers, or by covering with a tarp or other suitable cover.
- Control fugitive dust emissions during land clearing, grubbing, scraping, excavation, leveling, grading, or cut and fill operations with application of water or by presoaking.
- When transporting materials offsite, maintain a freeboard limit of at least 6 inches and cover or effectively wet to limit visible dust emissions.
- Limit and remove the accumulation of mud and/or dirt from adjacent public roadways at the end of each workday. (Use of dry rotary brushes is prohibited except when preceded or accompanied by sufficient wetting to limit visible dust emissions, and use of blowers is expressly forbidden.)
- Stabilize the surface of storage piles following the addition or removal of materials using water or chemical stabilizer/suppressants.
- Remove visible track-out from the site at the end of each workday.
- Cease grading or other activities that cause excessive (greater than 20 percent opacity) dust formation during periods of high winds (greater than 20 mph over a one-hour period).

7.2 - Recommended Measures to Reduce Equipment Exhaust

In addition, the GAMAQI guidance document lists the following measures as approved and recommended for construction activities. These measures are recommended:

- Maintain all construction equipment as recommended by manufacturer manuals.
- Shut down equipment when not in use for extended periods.
- Construction equipment shall operate no longer than eight cumulative hours per day.
- Use electric equipment for construction whenever possible in lieu of diesel or gasoline powered equipment.
- Curtail use of high-emitting construction equipment during periods of high or excessive ambient pollutant concentrations.
- All construction vehicles shall be equipped with proper emissions control equipment and kept in good and proper running order to substantially reduce NOx emissions.
- On-road and Off-road diesel equipment shall use diesel particulate filters if permitted under the manufacturer's guidelines.
- On-road and Off-road diesel equipment shall use cooled exhaust gas recirculation (EGR) if permitted under the manufacturer's guidelines.
- All construction workers shall be encouraged to shuttle (car-pool) to retail establishments or to remain on-site during lunch breaks.

7.3 - Recommended Measures to Reduce Equipment Exhaust

The following measures are recommended to further reduce the potential for long-term emissions from the Project. These measures are required as a matter of regulatory compliance:

- The Project design shall comply with applicable standards set forth in Title 24 of the Uniform Building Code to minimize total consumption of energy.
- The developer shall comply with the provisions of SJVAPCD Rule 4601 - Architectural Coatings, during the construction of all buildings and facilities. Application of architectural coatings shall be completed in a manner that poses the least emissions impacts whenever such application is deemed proficient.
- The applicant shall comply with the provisions of SJVAPCD Rule 4641 during the construction and pavement of all roads and parking areas within the project area. Specifically, the applicant shall not allow the use of:
  - Rapid cure cutback asphalt.
  - Medium cure cutback asphalt.
  - Slow cure cutback asphalt (as specified in SJVAPCD Rule 4641, Section 5.1.3); or Emulsified asphalt (as specified in SJVAPCD Rule 4641, Section 5.1.4).
  - The developer shall comply with applicable provisions of SJVAPCD Rule 9510 (Indirect Source Review).

SECTION 8 - LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed Project would have short-term air quality impacts due to construction activities as well as vehicular emissions. Both of these impacts would be mitigated and *were found to be less than significant before and after mitigation*.

The proposed Project would result in long-term air quality impacts due to operational and related mobile source emissions. These impacts would be mitigated and were found to *be less than significant before and after mitigation*.

The proposed Project would result in impacts to greenhouse gases and climate change due to construction and operational emissions. These impacts *were found to be less than significant*.

The proposed Project, in conjunction with other past, present, and foreseeable future projects, would result in cumulative short-term and long-term impacts to air quality. The proposed Project's incremental contribution to these impacts would be mitigated below thresholds of significance and would not be considered cumulatively considerable. Therefore, the Project's contribution to cumulative impacts *was found to be less than significant*.

The proposed Project, in conjunction with other past, present, and foreseeable future projects, would result in cumulative long-term impacts to global climate change. The proposed Project's incremental contribution to these impacts will be mitigated to the extent feasible and are considered *less than significant*.

SECTION 9 - REFERENCES

California Air Pollution Control Officers Association (CAPCOA). 2024. California Emissions Estimator Model tm (CalEEMod), version 2022.1.1.35, released November 2025.

California Air Resources Board (CARB). 2025. Background Emissions Data. https://www.arb.ca.gov/adam/index.html. Accessed December 2025.

--------. 2024a. California Greenhouse Gas Emissions for 2000 to 2022: Trends of Emissions and Other Indicators. 2024. https://ww2.arb.ca.gov/sites/default/files/2024-09/nc-2000_2022_ghg_inventory_trends.pdf

--------. 2025. Almanac Emission Projection Data. https://ww2.arb.ca.gov/applications/cepam2019v1-04-standard-emission-tool. Accessed 2025.

--------. 2024b. "Ambient Air Quality Standards." July 22, 2024. https://ww2.arb.ca.gov/sites/default/files/2024-08/AAQS%20Table_ADA_FINAL_07222024.pdf

California Environmental Protection Agency (CalEPA). 2006. Climate Action Team (CAT) Report to Governor Schwarzenegger and the Legislature. http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF

California Environmental Quality Act (CEQA) Statute and Guidelines. 2024. (Public Resources Code 21000 to 21177) and CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387).

Enviropedia, 2019. Greenhouse Gas Emissions website, accessed December 2025. http://www.enviropedia.org.uk/Global_Warming/Emissions.php

Fresno Council of Governments (Fresno COG). July 2024. Conformity Analysis for the 2025 Federal Transportation Improvement and the 2022 Regional Transportation Plan

Fresno County Department of Public Works and Planning (FCDPWP). 2024. Fresno County General Plan Policy Document.

Intergovernmental Panel on Climate Change (IPCC). 2017. Climate Change 2013: The Physical Science Basis. http://www.ipcc.ch/report/ar5/wg1/

---------. Climate Change 2014 Synthesis Report. 2014. https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf

Peters Engineering Group (Peters). 2020. Traffic Impact Study Proposed Tract 6294, April 2020.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2025a. Ambient Air Quality Standards & Valley Attainment Status. https://ww2.valleyair.org/air-quality-information/ambient-air-quality-standards-valley-attainmnet-status/, accessed December 2025.

----------. 2024. Air Monitoring Location Map. https://www.valleyair.org/media/3lkhl4ye/2024-network-plan-map.jpg, accessed December 2025.

----------. 2024a. 2024 Plan for the 2012 Annual $PM_{2.5}$ Standard. June 20, 2024. https://ww2.valleyair.org/media/gw5bacvj/2024-pm25-plan.pdf

----------. 2025b. 2024 Annual Report to the Community. https://www.valleyair.org/news-outreach-and-education/news/valley-air-district-releases-the-2024-annual-report-to-the-community/

----------. 2025c. 2024 Annual Report on the District's Indirect Source Review Program. January 7, 2025. https://ww2.valleyair.org/media/vzuixb0n/item-12_2024-isr-annual-report.pdf

----------. 2025d. Meteorological Data Zip Files for Bakersfield 2018-2022. https://www.valleyair.org/permitting/air-dispersion-modeling/meteorological-data-zip-files/

----------. 2022. 2022 Plan for the 2015 8-Hour Ozone Standard. December 15, 2022. https://ww2.valleyair.org/media/q55posm0/0000-2022-plan-for-the-2015-8-hour-ozone-standard.pdf

----------. 2015. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015.

----------. 2023. 2023 Maintenance Plan and Redesignation Request for the Revoked 1-Hour Ozone Standard. June 15, 2023. https://ww2.valleyair.org/media/itoegkch/03-adopted-2023-maintenance-plan-and-redesignation-request-for-the-revoked-1-hour-ozone-standard.pdf

United Nations, 2011. The Millennium Development Goals Report 2011. http://www.un.org/millenniumgoals/pdf/(2011_E)%20MDG%20Report%202011_Book%20LR.pdf

United States Energy Information Administration (U.S. EIA). 2023. International Energy Outlook 2023. https://www.eia.gov/outlooks/ieo/pdf/IEO2023_Narrative.pdf

United States Environmental Protection Agency (U.S. EPA). 2024. Inventory of US Greenhouse Gas Emissions and Sinks 1990–2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf.

United States Geological Survey's (USGS) National Map. 2021. Fresno, CA. 7.5 minute. https://viewer.nationalmap.gov/basic/?basemap=b1&category=ustopo&title=US%20Topo%20Download

United States Global Change Research Program (USGCRP). 2014. Climate Change Impacts in the United States: The Third National Climate Assessment. http://nca2014.globalchange.gov/.

Western Regional Climate Center, 2024. Fresno, California, Period of Record Monthly Climate Summary, 10/1/1937 to 6/09/2016. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0442. Accessed November 2025.

APPENDIX A

PROJECT EMISSION CALCULATIONS

VTTM 6294 Detailed Report

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1.1. Basic Project Information

Data Field	Value
Project Name	VTTM 6294
Construction Start Date	7/1/2026
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.7
Precipitation (days)	23
Location	36.81348448094748, -119.91520744658952
County	Fresno
City	Fresno
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2412
EDFZ	5
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.35

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	187	Dwelling Unit	30	364,650	2,190,304	—	598	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Transportation	T-14*	Provide Electric Vehicle Charging Infrastructure
Energy	E-10-B	Establish Onsite Renewable Energy Systems: Solar Power

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.8	3.2	29	29	0.06	1.2	5.2	6.4	1.1	2.6	3.8	—	6,717	6,717	0.27	0.07	1.8	6,742
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	65	65	27	28	0.06	1.1	2.5	3.6	1.0	0.98	2.0	—	6,704	6,704	0.27	0.08	0.05	6,728
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.5	4.3	7.1	11	0.02	0.24	0.63	0.88	0.22	0.28	0.50	—	2,150	2,150	0.08	0.05	0.55	2,168
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.82	0.79	1.3	1.9	< 0.005	0.04	0.12	0.16	0.04	0.05	0.09	—	356	356	0.01	0.01	0.09	359

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	3.8	3.2	29	29	0.06	1.2	5.2	6.4	1.1	2.6	3.8	—	6,717	6,717	0.27	0.06	0.41	6,742
2027	1.5	1.3	9.9	15	0.03	0.34	0.43	0.77	0.31	0.10	0.42	—	3,041	3,041	0.11	0.07	1.8	3,067
2028	1.5	1.2	9.4	15	0.03	0.30	0.43	0.74	0.28	0.10	0.38	—	3,028	3,028	0.11	0.07	1.6	3,054
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	3.7	3.1	27	28	0.06	1.1	2.5	3.6	1.0	0.98	2.0	—	6,704	6,704	0.27	0.08	0.05	6,728
2027	1.5	1.3	10.0	15	0.03	0.34	0.43	0.77	0.31	0.10	0.42	—	2,998	2,998	0.12	0.07	0.05	3,023
2028	65	65	9.5	15	0.03	0.30	0.43	0.74	0.28	0.10	0.38	—	2,985	2,985	0.12	0.07	0.04	3,010
2029	65	65	0.82	1.4	< 0.005	0.01	0.07	0.09	0.01	0.02	0.03	—	200	200	0.01	< 0.005	0.01	202
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.81	0.68	5.9	6.5	0.01	0.24	0.63	0.88	0.22	0.28	0.50	—	1,406	1,406	0.06	0.02	0.11	1,413
2027	1.1	0.91	7.1	11	0.02	0.24	0.31	0.55	0.22	0.07	0.30	—	2,150	2,150	0.08	0.05	0.55	2,168
2028	4.5	4.3	6.0	9.4	0.02	0.20	0.25	0.45	0.18	0.06	0.24	—	1,853	1,853	0.07	0.04	0.40	1,868
2029	2.8	2.8	0.04	0.06	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.7	8.7	< 0.005	< 0.005	< 0.005	8.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.15	0.12	1.1	1.2	< 0.005	0.04	0.12	0.16	0.04	0.05	0.09	—	233	233	0.01	< 0.005	0.02	234
2027	0.19	0.17	1.3	1.9	< 0.005	0.04	0.06	0.10	0.04	0.01	0.05	—	356	356	0.01	0.01	0.09	359
2028	0.82	0.79	1.1	1.7	< 0.005	0.04	0.05	0.08	0.03	0.01	0.04	—	307	307	0.01	0.01	0.07	309
2029	0.51	0.51	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.4	1.4	< 0.005	< 0.005	< 0.005	1.5

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2026	3.8	3.2	29	29	0.06	1.2	5.2	6.4	1.1	2.6	3.8	—	6,717	6,717	0.27	0.06	0.41	6,742
2027	1.5	1.3	9.9	15	0.03	0.34	0.43	0.77	0.31	0.10	0.42	—	3,041	3,041	0.11	0.07	1.8	3,067
2028	1.5	1.2	9.4	15	0.03	0.30	0.43	0.74	0.28	0.10	0.38	—	3,028	3,028	0.11	0.07	1.6	3,054
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	3.7	3.1	27	28	0.06	1.1	2.5	3.6	1.0	0.98	2.0	—	6,704	6,704	0.27	0.08	0.05	6,728
2027	1.5	1.3	10.0	15	0.03	0.34	0.43	0.77	0.31	0.10	0.42	—	2,998	2,998	0.12	0.07	0.05	3,023
2028	65	65	9.5	15	0.03	0.30	0.43	0.74	0.28	0.10	0.38	—	2,985	2,985	0.12	0.07	0.04	3,010
2029	65	65	0.82	1.4	< 0.005	0.01	0.07	0.09	0.01	0.02	0.03	—	200	200	0.01	< 0.005	0.01	202
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.81	0.68	5.9	6.5	0.01	0.24	0.63	0.88	0.22	0.28	0.50	—	1,406	1,406	0.06	0.02	0.11	1,413
2027	1.1	0.91	7.1	11	0.02	0.24	0.31	0.55	0.22	0.07	0.30	—	2,150	2,150	0.08	0.05	0.55	2,168
2028	4.5	4.3	6.0	9.4	0.02	0.20	0.25	0.45	0.18	0.06	0.24	—	1,853	1,853	0.07	0.04	0.40	1,868
2029	2.8	2.8	0.04	0.06	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.7	8.7	< 0.005	< 0.005	< 0.005	8.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.15	0.12	1.1	1.2	< 0.005	0.04	0.12	0.16	0.04	0.05	0.09	—	233	233	0.01	< 0.005	0.02	234
2027	0.19	0.17	1.3	1.9	< 0.005	0.04	0.06	0.10	0.04	0.01	0.05	—	356	356	0.01	0.01	0.09	359
2028	0.82	0.79	1.1	1.7	< 0.005	0.04	0.05	0.08	0.03	0.01	0.04	—	307	307	0.01	0.01	0.07	309
2029	0.51	0.51	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.4	1.4	< 0.005	< 0.005	< 0.005	1.5

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	16	15	6.3	59	0.11	0.22	8.9	9.1	0.21	2.2	2.5	104	13,759	13,863	11	0.53	37	14,343
Mit.	16	15	6.3	59	0.11	0.22	8.9	9.1	0.21	2.2	2.5	104	13,759	13,863	11	0.53	37	14,343

% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	14	14	6.9	41	0.10	0.21	8.9	9.1	0.21	2.2	2.4	104	12,727	12,831	11	0.58	3.5	13,292
Mit.	14	14	6.9	41	0.10	0.21	8.9	9.1	0.21	2.2	2.4	104	12,727	12,831	11	0.58	3.5	13,292
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	15	14	6.5	46	0.10	0.21	8.5	8.8	0.21	2.2	2.4	104	12,810	12,914	11	0.54	17	13,377
Mit.	15	14	6.5	46	0.10	0.21	8.5	8.8	0.21	2.2	2.4	104	12,810	12,914	11	0.54	17	13,377
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.7	2.6	1.2	8.3	0.02	0.04	1.6	1.6	0.04	0.39	0.43	17	2,121	2,138	1.9	0.09	2.8	2,215
Mit.	2.7	2.6	1.2	8.3	0.02	0.04	1.6	1.6	0.04	0.39	0.43	17	2,121	2,138	1.9	0.09	2.8	2,215
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	6.4	5.9	4.3	48	0.10	0.06	8.9	8.9	0.06	2.2	2.3	—	10,356	10,356	0.56	0.47	34	10,545
Area	9.4	9.4	0.10	11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	0.00	28	28	< 0.005	< 0.005	—	28
Energy	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	3,309	3,309	0.36	0.02	—	3,325

Water	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Waste	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	16	15	6.3	59	0.11	0.22	8.9	9.1	0.21	2.2	2.5	104	13,759	13,863	11	0.53	37	14,343
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.6	5.1	5.1	40	0.09	0.06	8.9	8.9	0.06	2.2	2.3	—	9,352	9,352	0.64	0.52	0.88	9,523
Area	8.4	8.4	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	3,309	3,309	0.36	0.02	—	3,325
Water	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Waste	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	14	14	6.9	41	0.10	0.21	8.9	9.1	0.21	2.2	2.4	104	12,727	12,831	11	0.58	3.5	13,292
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.6	5.1	4.6	40	0.09	0.06	8.5	8.6	0.06	2.2	2.2	—	9,421	9,421	0.58	0.48	14	9,594
Area	8.9	8.9	0.05	5.2	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	14	14	< 0.005	< 0.005	—	14
Energy	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	3,309	3,309	0.36	0.02	—	3,325
Water	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Waste	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	15	14	6.5	46	0.10	0.21	8.5	8.8	0.21	2.2	2.4	104	12,810	12,914	11	0.54	17	13,377
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.0	0.93	0.84	7.2	0.02	0.01	1.6	1.6	0.01	0.39	0.40	—	1,560	1,560	0.10	0.08	2.4	1,588
Area	1.6	1.6	0.01	0.95	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.3	2.3	< 0.005	< 0.005	—	2.3
Energy	0.04	0.02	0.34	0.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	548	548	0.06	< 0.005	—	550
Water	—	—	—	—	—	—	—	—	—	—	—	2.4	11	13	0.25	0.01	—	21
Waste	—	—	—	—	—	—	—	—	—	—	—	15	0.00	15	1.5	0.00	—	52

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
Total	2.7	2.6	1.2	8.3	0.02	0.04	1.6	1.6	0.04	0.39	0.43	17	2,121	2,138	1.9	0.09	2.8	2,215

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	6.4	5.9	4.3	48	0.10	0.06	8.9	8.9	0.06	2.2	2.3	—	10,356	10,356	0.56	0.47	34	10,545
Area	9.4	9.4	0.10	11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	0.00	28	28	< 0.005	< 0.005	—	28
Energy	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	3,309	3,309	0.36	0.02	—	3,325
Water	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Waste	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	16	15	6.3	59	0.11	0.22	8.9	9.1	0.21	2.2	2.5	104	13,759	13,863	11	0.53	37	14,343
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.6	5.1	5.1	40	0.09	0.06	8.9	8.9	0.06	2.2	2.3	—	9,352	9,352	0.64	0.52	0.88	9,523
Area	8.4	8.4	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	3,309	3,309	0.36	0.02	—	3,325
Water	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Waste	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	14	14	6.9	41	0.10	0.21	8.9	9.1	0.21	2.2	2.4	104	12,727	12,831	11	0.58	3.5	13,292
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.6	5.1	4.6	40	0.09	0.06	8.5	8.6	0.06	2.2	2.2	—	9,421	9,421	0.58	0.48	14	9,594
Area	8.9	8.9	0.05	5.2	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	14	14	< 0.005	< 0.005	—	14

Energy	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	3,309	3,309	0.36	0.02	—	3,325
Water	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Waste	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	15	14	6.5	46	0.10	0.21	8.5	8.8	0.21	2.2	2.4	104	12,810	12,914	11	0.54	17	13,377
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.0	0.93	0.84	7.2	0.02	0.01	1.6	1.6	0.01	0.39	0.40	—	1,560	1,560	0.10	0.08	2.4	1,588
Area	1.6	1.6	0.01	0.95	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.3	2.3	< 0.005	< 0.005	—	2.3
Energy	0.04	0.02	0.34	0.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	548	548	0.06	< 0.005	—	550
Water	—	—	—	—	—	—	—	—	—	—	—	2.4	11	13	0.25	0.01	—	21
Waste	—	—	—	—	—	—	—	—	—	—	—	15	0.00	15	1.5	0.00	—	52
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
Total	2.7	2.6	1.2	8.3	0.02	0.04	1.6	1.6	0.04	0.39	0.43	17	2,121	2,138	1.9	0.09	2.8	2,215

3. Construction Emissions Details

3.1. Site Preparation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.7	3.1	29	29	0.05	1.2	—	1.2	1.1	—	1.1	—	5,298	5,298	0.21	0.04	—	5,316
Dust From Material Movement	—	—	—	—	—	—	5.1	5.1	—	2.6	2.6	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.6	1.6	< 0.005	0.07	—	0.07	0.06	—	0.06	—	290	290	0.01	< 0.005	—	291
Dust From Material Movement	—	—	—	—	—	—	0.28	0.28	—	0.14	0.14	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.29	0.29	< 0.005	0.01	—	0.01	0.01	—	0.01	—	48	48	< 0.005	< 0.005	—	48
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.60	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	104	104	< 0.005	< 0.005	0.36	106
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.2	5.2	< 0.005	< 0.005	0.01	5.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.7	3.1	29	29	0.05	1.2	—	1.2	1.1	—	1.1	—	5,298	5,298	0.21	0.04	—	5,316
Dust From Material Movement	—	—	—	—	—	—	5.1	5.1	—	2.6	2.6	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.6	1.6	< 0.005	0.07	—	0.07	0.06	—	0.06	—	290	290	0.01	< 0.005	—	291
Dust From Material Movement	—	—	—	—	—	—	0.28	0.28	—	0.14	0.14	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.29	0.29	< 0.005	0.01	—	0.01	0.01	—	0.01	—	48	48	< 0.005	< 0.005	—	48
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.04	0.60	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	104	104	< 0.005	< 0.005	0.36	106
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.2	5.2	< 0.005	< 0.005	0.01	5.3

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.87	0.87	< 0.005	< 0.005	< 0.005	0.88
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.6	3.0	27	28	0.06	1.1	—	1.1	1.0	—	1.0	—	6,599	6,599	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	2.4	2.4	—	0.95	0.95	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.6	3.0	27	28	0.06	1.1	—	1.1	1.0	—	1.0	—	6,599	6,599	0.27	0.05	—	6,621

Dust From Material Movement	—	—	—	—	—	—	2.4	2.4	—	0.95	0.95	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.45	0.38	3.4	3.4	0.01	0.14	—	0.14	0.13	—	0.13	—	814	814	0.03	0.01	—	816
Dust From Material Movement	—	—	—	—	—	—	0.30	0.30	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.61	0.62	< 0.005	0.03	—	0.03	0.02	—	0.02	—	135	135	0.01	< 0.005	—	135
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.04	0.68	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	119	119	< 0.005	0.01	0.41	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.55	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	105	105	< 0.005	0.01	0.01	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13	13	< 0.005	< 0.005	0.02	14
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.2	2.2	< 0.005	< 0.005	< 0.005	2.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.4. Grading (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.6	3.0	27	28	0.06	1.1	—	1.1	1.0	—	1.0	—	6,599	6,599	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	2.4	2.4	—	0.95	0.95	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.6	3.0	27	28	0.06	1.1	—	1.1	1.0	—	1.0	—	6,599	6,599	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	2.4	2.4	—	0.95	0.95	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.45	0.38	3.4	3.4	0.01	0.14	—	0.14	0.13	—	0.13	—	814	814	0.03	0.01	—	816
Dust From Material Movement	—	—	—	—	—	—	0.30	0.30	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.61	0.62	< 0.005	0.03	—	0.03	0.02	—	0.02	—	135	135	0.01	< 0.005	—	135
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.04	0.68	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	119	119	< 0.005	0.01	0.41	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.55	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	105	105	< 0.005	0.01	0.01	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13	13	< 0.005	< 0.005	0.02	14
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.2	2.2	< 0.005	< 0.005	< 0.005	2.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.3	1.1	9.9	13	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.93	1.2	< 0.005	0.04	—	0.04	0.03	—	0.03	—	225	225	0.01	< 0.005	—	226
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	37	37	< 0.005	< 0.005	—	37
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.24	0.17	1.9	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	355	355	0.01	0.02	0.04	360
Vendor	0.02	0.01	0.44	0.19	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	259	259	0.01	0.04	0.02	270
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.02	0.02	0.01	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	35	35	< 0.005	< 0.005	0.06	35
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	24	24	< 0.005	< 0.005	0.02	25
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.7	5.7	< 0.005	< 0.005	0.01	5.8
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.0	4.0	< 0.005	< 0.005	< 0.005	4.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.3	1.1	9.9	13	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.93	1.2	< 0.005	0.04	—	0.04	0.03	—	0.03	—	225	225	0.01	< 0.005	—	226
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Roa Equipment	0.02	0.02	0.17	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	37	37	< 0.005	< 0.005	—	37
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.24	0.17	1.9	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	355	355	0.01	0.02	0.04	360
Vendor	0.02	0.01	0.44	0.19	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	259	259	0.01	0.04	0.02	270
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	35	35	< 0.005	< 0.005	0.06	35
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	24	24	< 0.005	< 0.005	0.02	25
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.7	5.7	< 0.005	< 0.005	0.01	5.8
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.0	4.0	< 0.005	< 0.005	< 0.005	4.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Roa Equipment	1.2	1.0	9.4	13	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Roa d Equipm ent	1.2	1.0	9.4	13	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Roa d Equipm ent	0.88	0.74	6.7	9.2	0.02	0.24	—	0.24	0.22	—	0.22	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Roa d Equipm ent	0.16	0.13	1.2	1.7	< 0.005	0.04	—	0.04	0.04	—	0.04	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.25	0.12	2.1	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	391	391	0.01	0.02	1.3	398
Vendor	0.02	0.01	0.40	0.18	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	0.04	0.53	264
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	0.15	1.7	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	348	348	0.01	0.02	0.03	353
Vendor	0.02	0.01	0.42	0.19	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	0.04	0.01	264
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.16	0.10	1.3	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	257	257	0.01	0.01	0.39	261
Vendor	0.01	0.01	0.29	0.13	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	181	181	< 0.005	0.03	0.16	189
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.23	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	43	43	< 0.005	< 0.005	0.06	43
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30	30	< 0.005	< 0.005	0.03	31
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.2	1.0	9.4	13	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Roa Equipment	1.2	1.0	9.4	13	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.88	0.74	6.7	9.2	0.02	0.24	—	0.24	0.22	—	0.22	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.13	1.2	1.7	< 0.005	0.04	—	0.04	0.04	—	0.04	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.25	0.12	2.1	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	391	391	0.01	0.02	1.3	398
Vendor	0.02	0.01	0.40	0.18	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	0.04	0.53	264
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	0.15	1.7	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	348	348	0.01	0.02	0.03	353
Vendor	0.02	0.01	0.42	0.19	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	0.04	0.01	264
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.17	0.16	0.10	1.3	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	257	257	0.01	0.01	0.39	261
Vendor	0.01	0.01	0.29	0.13	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	181	181	< 0.005	0.03	0.16	189
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.23	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	43	43	< 0.005	< 0.005	0.06	43
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30	30	< 0.005	< 0.005	0.03	31
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.2	0.99	8.9	13	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.2	0.99	8.9	13	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	0.67	0.56	5.0	7.3	0.01	0.17	—	0.17	0.16	—	0.16	—	1,351	1,351	0.05	0.01	—	1,356
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.92	1.3	< 0.005	0.03	—	0.03	0.03	—	0.03	—	224	224	0.01	< 0.005	—	224
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.23	0.11	2.0	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	384	384	0.01	0.02	1.1	390
Vendor	0.02	0.01	0.38	0.17	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	246	246	0.01	0.04	0.47	258
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.20	0.14	1.6	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	341	341	0.01	0.02	0.03	346
Vendor	0.02	0.01	0.41	0.18	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	247	247	0.01	0.04	0.01	258
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.07	0.92	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	199	199	0.01	0.01	0.27	202
Vendor	0.01	0.01	0.22	0.10	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	139	139	< 0.005	0.02	0.11	145
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.17	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	33	33	< 0.005	< 0.005	0.05	33
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	23	23	< 0.005	< 0.005	0.02	24

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.2	0.99	8.9	13	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.2	0.99	8.9	13	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.67	0.56	5.0	7.3	0.01	0.17	—	0.17	0.16	—	0.16	—	1,351	1,351	0.05	0.01	—	1,356
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	0.12	0.10	0.92	1.3	< 0.005	0.03	—	0.03	0.03	—	0.03	—	224	224	0.01	< 0.005	—	224
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.23	0.11	2.0	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	384	384	0.01	0.02	1.1	390
Vendor	0.02	0.01	0.38	0.17	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	246	246	0.01	0.04	0.47	258
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.20	0.14	1.6	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	341	341	0.01	0.02	0.03	346
Vendor	0.02	0.01	0.41	0.18	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	247	247	0.01	0.04	0.01	258
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.07	0.92	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	199	199	0.01	0.01	0.27	202
Vendor	0.01	0.01	0.22	0.10	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	139	139	< 0.005	0.02	0.11	145
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.17	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	33	33	< 0.005	< 0.005	0.05	33
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	23	23	< 0.005	< 0.005	0.02	24
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.82	0.69	6.6	9.9	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.64	0.95	< 0.005	0.02	—	0.02	0.02	—	0.02	—	145	145	0.01	< 0.005	—	145
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.12	0.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24	24	< 0.005	< 0.005	—	24
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.36	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	76	76	< 0.005	< 0.005	0.01	77
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.5	7.5	< 0.005	< 0.005	0.01	7.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.2	1.2	< 0.005	< 0.005	< 0.005	1.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.82	0.69	6.6	9.9	0.01	0.26	—	0.26	0.24	—	0.24	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.64	0.95	< 0.005	0.02	—	0.02	0.02	—	0.02	—	145	145	0.01	< 0.005	—	145
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.12	0.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24	24	< 0.005	< 0.005	—	24
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.36	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	76	76	< 0.005	< 0.005	0.01	77
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.5	7.5	< 0.005	< 0.005	0.01	7.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.2	1.2	< 0.005	< 0.005	< 0.005	1.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.1	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	65	65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.3	7.3	< 0.005	< 0.005	—	7.3
Architectural Coatings	3.6	3.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.2	1.2	< 0.005	< 0.005	—	1.2
Architectural Coatings	0.65	0.65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.32	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	68	68	< 0.005	< 0.005	0.01	69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.9	3.9	< 0.005	< 0.005	0.01	3.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.64	0.64	< 0.005	< 0.005	< 0.005	0.65
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. Architectural Coating (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.81	1.1	< 0.005	0.02	—	0.02	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	65	65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.3	7.3	< 0.005	< 0.005	—	7.3
Architectural Coatings	3.6	3.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.2	1.2	< 0.005	< 0.005	—	1.2
Architectural Coatings	0.65	0.65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.32	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	68	68	< 0.005	< 0.005	0.01	69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.9	3.9	< 0.005	< 0.005	0.01	3.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.64	0.64	< 0.005	< 0.005	< 0.005	0.65
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2029) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.79	1.1	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	65	65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.7	5.7	< 0.005	< 0.005	—	5.8
Architectural Coatings	2.8	2.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.95	0.95	< 0.005	< 0.005	—	0.95

Architectural Coating	0.51	0.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.30	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	67	67	< 0.005	< 0.005	0.01	68
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.0	3.0	< 0.005	< 0.005	< 0.005	3.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.49	0.49	< 0.005	< 0.005	< 0.005	0.50
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.16. Architectural Coating (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.79	1.1	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	65	65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	< 0.005	0.03	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.7	5.7	< 0.005	< 0.005	—	5.8
Architectural Coatings	2.8	2.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.95	0.95	< 0.005	< 0.005	—	0.95
Architectural Coatings	0.51	0.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.30	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	67	67	< 0.005	< 0.005	0.01	68
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.0	3.0	< 0.005	< 0.005	< 0.005	3.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.49	0.49	< 0.005	< 0.005	< 0.005	0.50
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	6.4	5.9	4.3	48	0.10	0.06	8.9	8.9	0.06	2.2	2.3	—	10,356	10,356	0.56	0.47	34	10,545
Total	6.4	5.9	4.3	48	0.10	0.06	8.9	8.9	0.06	2.2	2.3	—	10,356	10,356	0.56	0.47	34	10,545
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	5.6	5.1	5.1	40	0.09	0.06	8.9	8.9	0.06	2.2	2.3	—	9,352	9,352	0.64	0.52	0.88	9,523
Total	5.6	5.1	5.1	40	0.09	0.06	8.9	8.9	0.06	2.2	2.3	—	9,352	9,352	0.64	0.52	0.88	9,523
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.0	0.93	0.84	7.2	0.02	0.01	1.6	1.6	0.01	0.39	0.40	—	1,560	1,560	0.10	0.08	2.4	1,588
Total	1.0	0.93	0.84	7.2	0.02	0.01	1.6	1.6	0.01	0.39	0.40	—	1,560	1,560	0.10	0.08	2.4	1,588

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	6.4	5.9	4.3	48	0.10	0.06	8.9	8.9	0.06	2.2	2.3	—	10,356	10,356	0.56	0.47	34	10,545
Total	6.4	5.9	4.3	48	0.10	0.06	8.9	8.9	0.06	2.2	2.3	—	10,356	10,356	0.56	0.47	34	10,545
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	5.6	5.1	5.1	40	0.09	0.06	8.9	8.9	0.06	2.2	2.3	—	9,352	9,352	0.64	0.52	0.88	9,523

Total	5.6	5.1	5.1	40	0.09	0.06	8.9	8.9	0.06	2.2	2.3	—	9,352	9,352	0.64	0.52	0.88	9,523
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.0	0.93	0.84	7.2	0.02	0.01	1.6	1.6	0.01	0.39	0.40	—	1,560	1,560	0.10	0.08	2.4	1,588
Total	1.0	0.93	0.84	7.2	0.02	0.01	1.6	1.6	0.01	0.39	0.40	—	1,560	1,560	0.10	0.08	2.4	1,588

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Total	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Total	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	162	162	0.03	< 0.005	—	163
Total	—	—	—	—	—	—	—	—	—	—	—	—	162	162	0.03	< 0.005	—	163

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Total	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Total	—	—	—	—	—	—	—	—	—	—	—	—	977	977	0.16	0.02	—	986
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	162	162	0.03	< 0.005	—	163
Total	—	—	—	—	—	—	—	—	—	—	—	—	162	162	0.03	< 0.005	—	163

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339

Total	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339
Total	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.34	0.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	386	386	0.03	< 0.005	—	387
Total	0.04	0.02	0.34	0.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	386	386	0.03	< 0.005	—	387

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339
Total	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339
Total	0.21	0.11	1.8	0.78	0.01	0.15	—	0.15	0.15	—	0.15	—	2,332	2,332	0.21	< 0.005	—	2,339
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	0.04	0.02	0.34	0.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	386	386	0.03	< 0.005	—	387
Total	0.04	0.02	0.34	0.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	386	386	0.03	< 0.005	—	387

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	7.8	7.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.63	0.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.99	0.94	0.10	11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	28	28	< 0.005	< 0.005	—	28
Total	9.4	9.4	0.10	11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	0.00	28	28	< 0.005	< 0.005	—	28
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	7.8	7.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architect Coatings	0.63	0.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	8.4	8.4	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.4	1.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.11	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.09	0.08	0.01	0.95	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.3	2.3	< 0.005	< 0.005	—	2.3
Total	1.6	1.6	0.01	0.95	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.3	2.3	< 0.005	< 0.005	—	2.3

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	7.8	7.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.63	0.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape	0.99	0.94	0.10	11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	28	28	< 0.005	< 0.005	—	28
Total	9.4	9.4	0.10	11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	0.00	28	28	< 0.005	< 0.005	—	28
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	7.8	7.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.63	0.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	8.4	8.4	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.4	1.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.11	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.09	0.08	0.01	0.95	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.3	2.3	< 0.005	< 0.005	—	2.3
Total	1.6	1.6	0.01	0.95	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.3	2.3	< 0.005	< 0.005	—	2.3

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Total	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Total	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2.4	11	13	0.25	0.01	—	21
Total	—	—	—	—	—	—	—	—	—	—	—	2.4	11	13	0.25	0.01	—	21

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Total	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Total	—	—	—	—	—	—	—	—	—	—	—	14	66	81	1.5	0.04	—	129
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2.4	11	13	0.25	0.01	—	21
Total	—	—	—	—	—	—	—	—	—	—	—	2.4	11	13	0.25	0.01	—	21

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Total	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Total	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	15	0.00	15	1.5	0.00	—	52
Total	—	—	—	—	—	—	—	—	—	—	—	15	0.00	15	1.5	0.00	—	52

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Total	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Total	—	—	—	—	—	—	—	—	—	—	—	89	0.00	89	8.9	0.00	—	313
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	15	0.00	15	1.5	0.00	—	52
Total	—	—	—	—	—	—	—	—	—	—	—	15	0.00	15	1.5	0.00	—	52

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.6	2.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipm Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	8/13/2026	9/10/2026	5.0	20	—
Grading	Grading	9/11/2026	11/13/2026	5.0	45	—
Building Construction	Building Construction	11/14/2026	10/14/2028	5.0	500	—
Paving	Paving	10/15/2028	12/3/2028	5.0	35	—
Architectural Coating	Architectural Coating	12/4/2028	1/22/2029	5.0	35	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.0	8.0	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.0	8.0	84	0.37
Grading	Excavators	Diesel	Average	2.0	8.0	36	0.38
Grading	Graders	Diesel	Average	1.00	8.0	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.0	367	0.40
Grading	Scrapers	Diesel	Average	2.0	8.0	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.0	8.0	84	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.0	367	0.29
Building Construction	Forklifts	Diesel	Average	3.0	8.0	82	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.0	14	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.0	7.0	84	0.37
Building Construction	Welders	Diesel	Average	1.00	8.0	46	0.45
Paving	Pavers	Diesel	Average	2.0	8.0	81	0.42
Paving	Paving Equipment	Diesel	Average	2.0	8.0	89	0.36

Paving	Rollers	Diesel	Average	2.0	8.0	36	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.0	37	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.0	8.0	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.0	8.0	84	0.37
Grading	Excavators	Diesel	Average	2.0	8.0	36	0.38
Grading	Graders	Diesel	Average	1.00	8.0	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.0	367	0.40
Grading	Scrapers	Diesel	Average	2.0	8.0	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.0	8.0	84	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.0	367	0.29
Building Construction	Forklifts	Diesel	Average	3.0	8.0	82	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.0	14	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.0	7.0	84	0.37
Building Construction	Welders	Diesel	Average	1.00	8.0	46	0.45
Paving	Pavers	Diesel	Average	2.0	8.0	81	0.42
Paving	Paving Equipment	Diesel	Average	2.0	8.0	89	0.36
Paving	Rollers	Diesel	Average	2.0	8.0	36	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.0	37	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix

Site Preparation	Worker	18	7.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	4.0	HHDT,MHDT
Site Preparation	Hauling	0.00	20	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	Worker	20	7.7	LDA,LDT1,LDT2
Grading	Vendor	—	4.0	HHDT,MHDT
Grading	Hauling	0.00	20	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	Worker	67	7.7	LDA,LDT1,LDT2
Building Construction	Vendor	20	4.0	HHDT,MHDT
Building Construction	Hauling	0.00	20	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	Worker	15	7.7	LDA,LDT1,LDT2
Paving	Vendor	—	4.0	HHDT,MHDT
Paving	Hauling	0.00	20	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	Worker	13	7.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	4.0	HHDT,MHDT
Architectural Coating	Hauling	0.00	20	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	Worker	18	7.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	4.0	HHDT,MHDT
Site Preparation	Hauling	0.00	20	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	Worker	20	7.7	LDA,LDT1,LDT2

Grading	Vendor	—	4.0	HHDT,MHDT
Grading	Hauling	0.00	20	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	Worker	67	7.7	LDA,LDT1,LDT2
Building Construction	Vendor	20	4.0	HHDT,MHDT
Building Construction	Hauling	0.00	20	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	Worker	15	7.7	LDA,LDT1,LDT2
Paving	Vendor	—	4.0	HHDT,MHDT
Paving	Hauling	0.00	20	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	Worker	13	7.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	4.0	HHDT,MHDT
Architectural Coating	Hauling	0.00	20	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	738,416	246,139	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	30	0.00	0.00
Grading	—	—	135	0.00	0.00
Paving	0.00	0.00	0.00	0.00	2.1

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Phase Name	Land Use	Area Paved (acres)	% Asphalt
Paving	Single Family Housing	2.1	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	204	0.03	< 0.005
2027	0.00	204	0.03	< 0.005
2028	0.00	204	0.03	< 0.005
2029	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	1,765	1,784	1,599	636,624	12,511	12,643	11,331	4,511,889

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	1,765	1,784	1,599	636,624	12,511	12,643	11,331	4,511,889

5.10. Operational Area Sources

5.10.1. Hearths

Land Use	Hearth Type	Unmitigated (number)	Mitigated (number)
Single Family Housing	Wood Fireplaces	0	0
Single Family Housing	Gas Fireplaces	0	0
Single Family Housing	Propane Fireplaces	0	0
Single Family Housing	Electric Fireplaces	0	0
Single Family Housing	No Fireplaces	187	187
Single Family Housing	Conventional Wood Stoves	0	0
Single Family Housing	Catalytic Wood Stoves	0	0
Single Family Housing	Non-Catalytic Wood Stoves	0	0
Single Family Housing	Pellet Wood Stoves	0	0

5.10.2. Architectural Coatings

—	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
undefined	738,416	246,139	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,747,811	204	0.0330	0.0040	7,276,604

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,747,811	204	0.0330	0.0040	7,276,604

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	7,535,352	36,748,269

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	7,535,352	36,748,269

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	166	0.00

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	166	0.00

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.5	2.5	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.14.2. Mitigated

Land Use	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.5	2.5	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	32	annual days of extreme heat
Extreme Precipitation	1.1	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	1	1	4
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	1	1	1	2
Drought	1	1	1	2

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	77
AQ-PM	93
AQ-DPM	89
Drinking Water	93
Lead Risk Housing	32
Pesticides	88
Toxic Releases	66
Traffic	64
Effect Indicators	—
CleanUp Sites	29
Groundwater	0.00
Haz Waste Facilities/Generators	65
Impaired Water Bodies	24
Solid Waste	78

Sensitive Population	—
Asthma	83
Cardio-vascular	60
Low Birth Weights	40
Socioeconomic Factor Indicators	—
Education	74
Housing	56
Linguistic	61
Poverty	67
Unemployment	81

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	41.5629411
Employed	46.86256897
Median HI	54.54895419
Education	—
Bachelor's or higher	30.70704478
High school enrollment	100
Preschool enrollment	16.32234056
Transportation	—
Auto Access	71.35891184
Active commuting	11.25368921
Social	—
2-parent households	24.91979982
Voting	29.71897857

Neighborhood	—
Alcohol availability	79.37892981
Park access	12.78070063
Retail density	26.40831515
Supermarket access	21.87860901
Tree canopy	2.55357372
Housing	—
Homeownership	62.4534839
Housing habitability	70.99961504
Low-inc homeowner severe housing cost burden	89.76004106
Low-inc renter severe housing cost burden	65.18670602
Uncrowded housing	32.04157577
Health Outcomes	—
Insured adults	52.48299756
Arthritis	83.7
Asthma ER Admissions	30.8
High Blood Pressure	70.1
Cancer (excluding skin)	85.3
Asthma	37.3
Coronary Heart Disease	83.6
Chronic Obstructive Pulmonary Disease	68.2
Diagnosed Diabetes	55.5
Life Expectancy at Birth	24.5
Cognitively Disabled	41.3
Physically Disabled	60.6
Heart Attack ER Admissions	20.7
Mental Health Not Good	37.4
Chronic Kidney Disease	79.8

Obesity	44.9
Pedestrian Injuries	43.0
Physical Health Not Good	48.3
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	48.9
Current Smoker	47.6
No Leisure Time for Physical Activity	34.5
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	19.9
Elderly	85.6
English Speaking	37.8
Foreign-born	34.4
Outdoor Workers	35.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	70.6
Traffic Density	57.6
Traffic Access	0.0
Other Indices	—
Hardship	71.3
Other Decision Support	—
2016 Voting	26.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	90

Healthy Places Index Score for Project Location (b)	35
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

8.1. Justifications

Screen	Justification
Land Use	Adjusted to match actual acreage
Construction: Construction Phases	Adjusted to match anticipated construction dates
Operations: Fleet Mix	ADjusted Fleet Mix to approved SJVAPCD Residential Fleet Mix for year 2026
Operations: Hearths	No Fireplaces or woodstoves

APPENDIX B

HEALTH RISK ASSESSMENT MODELING FILES (ELECTRONIC)

BIOLOGICAL RESOURCE EVALUATION

LENNAR HOMES OF CALIFORNIA

VTTM 6294 PROJECT



NOVEMBER 2025

BIOLOGICAL RESOURCE EVALUATION

VTTM 6294 PROJECT

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November 2025

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Project #200124.03

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EXECUTIVE SUMMARY

This Biological Resource Evaluation (BRE) report provides the results of a biological survey conducted by QK for the VTTM 6294 Project (Project) on behalf of Lennar Homes of California (Lennar). In order to comply with the California Environmental Quality Act (CEQA), a biological evaluation was conducted to identify the potential for sensitive biological resources to occur on or near the Project site.

The Project site is located southeast of the intersection of Grantland Avenue and Barstow Avenue in the City of Fresno (City), California. The proposed project consists of a new residential development.

A review of available literature and agency databases was conducted to obtain information about natural communities, special-status plant and wildlife species, waters and wetlands, and other sensitive resources in the vicinity of the Project site. QK conducted a biological reconnaissance survey on October 15, 2025, to determine land use and potential presence of natural vegetation communities, special-status species, wetlands, and State and/or federal jurisdictional waters. The Biological Study Area (BSA) includes the Project site and a 250-foot survey buffer surrounding the Project disturbance footprint.

No observations of special-status plant species were documented during the site survey. No diagnostic sign or observations of special-status wildlife species were observed near the Project site. No wetlands or other sensitive biological resources were observed on the Project site; however, two water features are near the Project site that will not be impacted by Project activities.

Based on literature and database research and the survey results, there is a potential for special-status wildlife species to be impacted by construction site activities; western burrowing owl (*Athene cunicularia hypugaea*) and American badger (*Taxidea taxus*) could potentially use the existing wildlife dens and burrows in or near the Project disturbance footprint. Swainson's hawks (*Buteo swainsoni*) could potentially nest in nearby resources (trees, power poles, etc.) near the Project site (within 0.5 miles). There is potential for nesting migratory birds and other raptors species, protected by the Migratory Bird Treaty Species Act, to occur on or near the Project site and surrounding areas.

With the implementation of Best Management Practices and recommended avoidance measures, the Project will have minimal impacts to special-status species, Swainson's hawks, migratory birds, and raptors. There is expected to be no impact on special-status plant species, sensitive natural communities, wetlands or water features, or any other sensitive biological resources.

SECTION 1 - INTRODUCTION

Lennar (the Applicant) proposes to develop a 30-acre property of medium density housing within the City of Fresno. To comply with the California Environmental Quality Act (CEQA), a biological evaluation was conducted to identify the potential for sensitive biological resources to occur on or near the Project site. This Biological Resource Evaluation (BRE) provides the basic biological information needed for the permitting process.

1.1 - Project Location

The Project site is located southeast of the intersection of Grantland Avenue and Barstow Avenue in the City of Fresno, California. The Project site is identified by Assessor Parcel Numbers (APN) 505-060-07, within Section 9, Township 13 South, Range 19 East, Mount Diablo Base and Meridian (MDB&M).

1.2 - Project Description

The Applicant proposes to develop 185 single-family residences, a 0.61-acre park, and associated entitlements located southeast of Grantland Avenue and Barstow Avenue in the City of Fresno, California (Project). The parcel is within the boundaries of the proposed West Area Neighborhoods Specific Plan (WANSP) area. The land is currently undeveloped and identified as Open Space/Agriculture and Regional Mixed Use (RMX).

1.3 - Purpose, Goals, and Objectives for this Report

This BRE report includes the results of a biological survey and available biological and natural resource database search conducted by QK biologists at the Project site. This report is consistent with the requirements for an analysis of impacts to biological resources needed of an Initial Study/ Mitigated Negative Declaration following guidelines established by CEQA.

The primary focus of this report is to provide information about the presence of sensitive biological resources on the Project and develop measures to avoid and minimize impacts of the Project on those resources. To accomplish that goal, this BRE provides information on the condition and sensitivity of the sensitive biological resources present or potentially present on and adjacent to the Project site and evaluates Project impacts to those resources. This BRE focuses on providing information and sensitive natural communities, special-status species, wildlife movement corridors, and wetlands and waters by conducting a desktop analysis of site conditions and verifying those findings with an on-site biological survey.

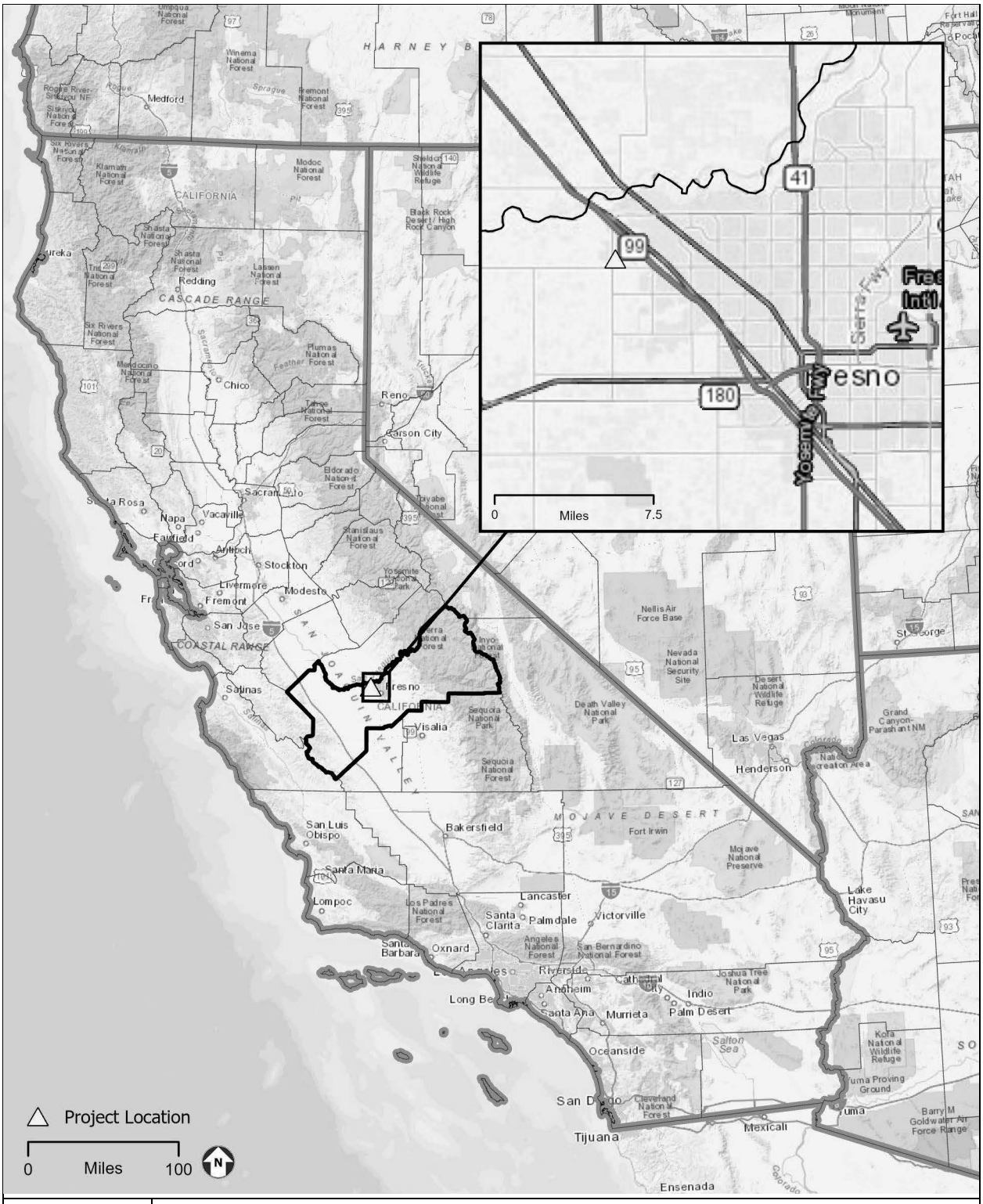




Figure 1-1
Regional Map
VTTM 6294 Project,
Fresno, California



Figure 1-2
Project Location Map
VTTM 6294 Project,
Fresno, California

SECTION 2 - METHODS

2.1 - Definition of Biological Study Area

The Biological Study Area (BSA) includes the Project site and a 250-foot survey buffer surrounding the Project disturbance footprint, where feasible (Figure 2-1).

2.2 - Literature Review and Database Analysis

The following online resources were reviewed for information on special-status biological resources in the Project vicinity:

- California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB; CDFW 2025a).
- CDFW's Biogeographic Information and Observation System (BIOS; CDFW 2025b).
- CDFW's Special Animals List (CDFW 2025c).
- CDFW's California Wildlife Habitat Relationships (CWHR) System (Mayer and Laudenslayer 1988).
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2025).
- United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation System (IPaC; USFWS 2025a).
- USFWS Critical Habitat Mapper (USFWS 2025b).
- USFWS National Wetlands Inventory (NWI; USFWS 2025c).
- USGS National Hydrography Dataset (NHD; USGS 2025).
- Federal Emergency Management Agency (FEMA) flood zone maps (FEMA 2025).
- United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2025)
- Current and historical aerial imagery (Google LLC 2025, Esri 2025).

The CNDDB and CNPS queries focused on the *Herndon* USGS 7.5-minute quadrangle in which the Project is located, plus the surrounding eight quadrangles: *Madera, Gregg, Lanes Bridge, Biola, Fresno North, Kerman, Kearney Park,* and *Fresno South.* To satisfy other standard search criteria, CNDDB records within a 10-mile radius of the Project site were queried separately from the broader database search.



Figure 2-1
Biological Study Area
VTTM 6294 Project, Fresno, California

CNDDB provides element-specific spatial information on individual documented occurrences of special-status species and sensitive natural vegetation communities. The CNPS database provides similar information, but at a much lower spatial resolution, for additional sensitive plant species tracked by the CNPS. The CDFW Special Animals List and USFWS IPaC provide no spatial data on wildlife occurrences and provide only lists of species potentially present. Wildlife species designated as "Fully Protected" by California Fish and Game Code Sections 5050 (Fully Protected reptiles and amphibians), 3511 (Fully Protected birds), and 4700 (Fully Protected mammals) are also included on the final list of evaluated species. The database search results can be found in Appendix A.

A review of the NWI was completed to identify whether wetlands have previously been documented on or adjacent to the Project site. The NWI, which is operated by the USFWS, is a collection of wetland and riparian maps that depicts graphic representations of the type, size, and location of wetland, deep water, and riparian habitats in the United States. In addition to the NWI, regional hydrologic information from the NHD was obtained from the USGS to evaluate the potential occurrence of blueline streams within or near the Project site.

Soils data were obtained from the USDA NRCS Web Soil Survey, climate information was obtained from the Western Regional Climate Center, and land use information was obtained from available aerial imagery (NRCS 2025; WRCC 2025; Google LLC 2025). Information about flood zones was obtained from the Federal Emergency Management Agency, Department of Homeland Security (FEMA 2025).

The results of the database inquiries were reviewed to extract pertinent information on site conditions and evaluate the potential for sensitive biological resources to occur within or near the proposed Project site. Only those resources with the potential to be present and affected by the Project were included and considered in this document. The potential presence of natural communities and special-status species was based on distributional ranges overlapping the Project site and the presence of habitat and/or primary constituent habitat elements.

2.3 - Reconnaissance-Level Field Surveys

A biological reconnaissance survey of the BSA was conducted by QK Environmental Scientists Eric Madueno and Dylan Burkey on October 15, 2025. The survey consisted of meandering pedestrian transects spaced 50 to 100 feet apart throughout the BSA, where accessible. Areas with suitable habitat that could not be accessed, such as private residences or adjacent agricultural fields, were surveyed by use of high-power binoculars.

Tasks completed during the survey included determining and documenting current land use, developing an inventory of plant species, wildlife species, and wildlife sign (e.g., scat, burrows, nests, feathers, tracks, etc.), characterizing vegetation associations and habitat conditions within the BSA, assessing the potential for federal, State-listed and other special-status plant and wildlife species that may occur on and near the Project site based on existing conditions, and assessing the potential for migratory birds and raptors to nest on and near the Project site. In addition, all historical wetland and water features documented by NWI

and NHD were field verified. All spatial data were recorded using Environmental Systems Research Institute (ESRI) Field Maps for ArcGIS software installed on an iPad. Site conditions were documented with representative photographs (Appendix B).

SECTION 3 - ENVIRONMENTAL SETTING

This section identifies the regional and local environmental setting of the Project and describes existing baseline conditions. The environmental setting of the BSA was obtained from various sources of literature, databases, and aerial photographs. Site conditions were verified and updated during the site reconnaissance survey conducted by QK Environmental Scientists (Table 3-1).

Table 3-1
Field Survey Personnel and Timing

Date	Personnel	Time	Weather Conditions	Temperature
10/15/2025	Eric Madueno, Dylan Burkey	0845 – 1100	Partially Cloudy	55 - 63F

3.1 - Topography

The Project site is on the floor of the San Joaquin Valley west of the Sierra Nevada foothills. The topography on the site is relatively flat, with an elevation range of approximately 290 to 300 feet above mean sea level.

3.2 - Climate

The region in which the Project is located is characterized by a Mediterranean climate of hot summers and wet, mild winters. Average high temperatures range from 54.6°F in January to 98.3°F in July, and it is not uncommon for temperatures to exceed 100°F during the summer (WRCC, 2025). Average low temperatures range from 37.3°F in December to 65.7°F in July. Precipitation occurs primarily as rain, most of which falls between November and April. Precipitation may also occur as dense fog during the winter known as Tule Fog. Rain rarely falls during the summer months.

3.3 - Land Use

Land use surrounding the Project area consists of residential housing, agriculture, non-native grassland, and the Herndon Canal. Land use within the Project boundary consists of non-native annual grassland and previous orchard; the property owner has uprooted the trees and they will be removed. It is bounded by Herndon Canal to the north, Grantland Avenue to the west, Herndon Canal to the east, and agricultural crop production and residential housing to the south.

3.4 - Soils

The Project site is underlain by one soil type, San Joaquin sandy loam (NRCS 2025). This soil series is described by the NRCS and is listed below.

San Joaquin sandy loam (0 to 3 percent slopes): The San Joaquin series consists of well and moderately well drained soils that formed in alluvium derived from mixed but dominantly granitic rock sources and is moderately deep to a duripan (NRCS 2025). This soil type occurs on undulating low terraces with slopes of 0 to 9 percent. San Joaquin soils are on hummocky, nearly level to undulating terraces at elevations of about 20 to 500 feet. Some areas have been leveled. They formed in alluvium from mixed but mainly granitic rock sources. The climate is dry with hot dry summers and cool moist and foggy winters. Well and moderately well drained. Some areas are subject to rare or occasional flooding. It is used for cropland and livestock grazing (NRCS 2025).

3.5 - Hydrology

There are two water features within the BSA, as defined by the NHD and NWI and they were confirmed present during the survey (USGS 2025; USFWS 2025c). The Herndon Canal is classified as a riverine intermittent streambed with seasonal flooding and excavated wetland. The Epstein canal is classified as a riverine unknown perennial stream with an unconsolidated bottom, semi-permanently flooding, and excavated wetland (USGS 2025; USFWS 2025c). The Epstein canal flows south into the Herndon Canal which bounds the Project site along the northern boundary.

According to FEMA, the BSA resides within an Area of Minimal Flood Hazard.



Figure 3-1
NHD NWI Map
VVTM 6294 Project, Fresno, California

3.6 - General Biological Conditions

The Project site is a 30-acre parcel that consists of an orchard where the trees have been uprooted for removal. The rest of the site is recently disked non-native grasslands. There were no sensitive vegetative communities or special-status plant species observed. The urban development surrounding the Project site contains valley oak (*Quercus lobata*) and various ornamental shrubs and trees including pines (*Pinus* sp.) and sycamore (*Platanus* sp.) within the BSA.

There are several large trees within the BSA that could support nesting birds and/or raptors, but no nests were observed during the site visit which was conducted outside of the nesting bird season. Smaller ornamental trees associated with the private residences surrounding the Project site could support nesting passerine bird species. Common migratory bird species observed during the survey included mourning dove (*Zenaida macroura*) and common raven (*Corvus corax*). A red-tailed hawk (*Buteo jamaicensis*) was observed perching on a utility pole within the BSA.

Small mammal burrows are present within the BSA and Project site in the orchard, non-native grasslands, and both banks of the Herndon Canal. Numerous California ground squirrels (*Otospermophilus beecheyi*) and desert cottontails (*Sylvilagus audubonii*) were observed in the orchard. No dens suitable for special-status species such as San Joaquin kit fox (*Vulpes macrotis*), American badger (*Taxidea taxus*), and western burrowing owl (*Athene cunicularia hypugaea*) were present within the BSA. Sign (den, burrow, scat, tracks, etc.) of domestic dog (*Canis familiaris*), deer mouse (*Peromyscus maniculatus*), and coyote (*Canis latrans*) were observed in the Project site.

A complete list of plant and wildlife species observed within the BSA during the biological reconnaissance survey is included in Appendix C.

SECTION 4 - FINDINGS

4.1 - Sensitive Natural Communities

4.1.1 - RESULTS OF LITERATURE REVIEW AND DATABASE SEARCHES

Literature results from the surrounding nine-quadrangle queries for the Project site identified four sensitive natural vegetation communities that may occur in the vicinity: Northern Hardpan Vernal Pool, Northern Claypan Vernal Pool, and Great Valley Mixed Riparian Forest.

4.1.2 - PRESENCE OF SENSITIVE NATURAL COMMUNITIES

Northern Hardpan Vernal Pool, Northern Claypan Vernal Pool, and Great Valley Mixed Riparian Forest communities were not present within the BSA or the Project site. In addition, the BSA does not provide habitat that would support these communities.

4.2 - Special-Status Plants

4.2.1 - Results of Literature Review and Database Searches

There were fifteen special-status plant species identified in the literature and database review that are known or have the potential to occur within the surrounding nine-quadrangles centered on the Project site (Table 4-1). None of the special-status plant species have historical CNDDB or CNPS records occurring on or overlapping the BSA or were observed during the site survey.

Table 4-1
Special-Status Plant Species Occurring in the Region of the BSA
(Source: CNDDB 2025, CNPS 2025, and USFWS 2025)

Scientific Name	Common Name	Status
Atriplex cordulata var. *cordulata*	heartscale	1B.2
Atriplex minuscula	lesser saltscale	1B.1
Caulanthus californicus	California jewelflower	FE, SE, 1B.1
Chloropyron palmatum	palmate-bracted bird's beak	FE, SE, 1B.1
Delphinium recurvatum	recurved larkspur	1B.2
Eryngium spinosepalum	spiny-sepaled button-celery	1B.2
Imperata breyifolia	California satintail	2B.1
Lasthenia chrysantha	alkali-sink goldfields	1B.2
Layia munzii	Munz's tidy-tips	1B.2
Leptosiphon serrulatus	Madera leptosiphon	1B.2
Navarretia myersii ssp. myersii	pincushion navarretia	1B.1
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	FT, SE, 1B.1
Orcuttia pilosa	hairy Orcutt grass	FT, SE, 1B.1
Puccinellia simplex	California alkali grass	1B.2
Sagittaria sanfordii	Sanford's arrowhead	1B.2

FE Federally Endangered
FT Federally Threatened
SE State Endangered
CRPR (California Rare Plant Rank):
1B Rare, Threatened, or Endangered in California and elsewhere.
2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere.
CRPR Threat Code Extension:
.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)

4.2.2 - Presence of Special-Status Plants

No special-status plant species were present within the BSA. The survey coincided with some, but not all, of the plant species' optimal blooming periods; but none of the species identified in the CNDDB or IPaC database queries are expected to occur on-site due to the lack of suitable habitat conditions (previously disked agricultural field) and/or because the BSA is located outside of the species' known range. The Project site is degraded from

historical agricultural uses, and the adjacent lands have been equally disturbed for residential development and as transportation corridors.

A complete list of plant species observed during the biological reconnaissance survey is included in Appendix C.

4.3 - Special-Status Wildlife

4.3.1 - Results of Literature Review and Database Searches

There were 21 special-status wildlife species identified in the literature and database review that are known or have the potential to occur within the surrounding nine-quad search area centered on the Project (Table 4-2). None of the special-status wildlife species have historical CNDDB records occurring on or overlapping the BSA or were observed during the site survey.

Table 4-2
Special-Status Wildlife Species Occurring in the Region of the BSA
(Source: CNDDB 2025, and USFWS 2025)

Scientific Name	Common Name	Status
Invertebrates		
Bombus crotchii	Crotch's bumble bee	SCE
Danaus plexippus	monarch butterfly	FPT
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT
Aquatic Invertebrates		
Branchinecta lynchi	vernal pool fairy shrimp	FT
Fish		
Mylopharodon conocephalus	hardhead	SSC
Amphibians		
Ambystoma californiense pop 1	California tiger salamander central California DPS	FT, ST, WL
Spea hammondii	western spadefoot	FPT, SSC
Reptiles		
Actinemys marmorata	northwestern pond turtle	FPT, SSC
Anniella pulchra	northern California legless lizard	SSC
Arizona elegans occidentalis	California glossy snake	SSC
Gambelia sila	blunt-nosed leopard lizard	FE, SE, SFP
Phrynosoma blainvillii	coast horned lizard	SSC
Birds		
Agelaius tricolor	tricolored blackbird	ST, SSC
Athene cunicularia hypugaea	burrowing owl	SCE, SSC
Buteo swainsoni	Swainson's hawk	ST
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FT, SE

Scientific Name	Common Name	Status
Mammals		
Antrozous pallidus	pallid bat	SSC
Dipodomys nitratoides exilis	Fresno kangaroo rat	FE, SE
Eumops perotis californicus	western mastiff bat	SSC
Taxidea taxus	American badger	SSC
Vulpes macrotis mutica	San Joaquin kit fox	FE, ST

Abbreviations:
FE Federally Endangered
FT Federally Threatened
FPT Federally Proposed Threatened
SE State Endangered
ST State Threatened
SCE State Candidate Endangered
SFP State Fully Protected, CDFW
SSC Species of Special Concern, CDFW
WL Watch List, CDFW

4.3.2 - PRESENCE OF SPECIAL-STATUS WILDLIFE

Invertebrates:

There is low quality nesting habitat present within the BSA for Crotch's bumblebee (*Bombus crotchii*). The dead trees and small mammal burrows present within the BSA could be used as nesting habitat. The BSA lacks suitable foraging habitat for Crotch's bumble bee. Although the site survey was not conducted during the optimal blooming period for some of the required foraging plant species, none of the primary plant species that Crotch's bumble bee feeds on were observed within the BSA during the survey or in historical imagery.

The BSA lacks suitable roosting habitat for monarch butterfly (*Danaus plexippus*). The BSA does not contain any milkweed to support monarch butterflies and there are no CNDDB records within 10 miles of the Project site. The BSA is outside of the accepted distribution range of valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). The BSA contains no elderberry required by this species. Both species are expected to be absent from the site.

Aquatic Invertebrates:

The BSA lacks vernal pool habitats required by vernal pool fairy shrimp (*Branchinecta lynchi*). This species is unlikely to occur within the BSA.

Fish:

There is no stream habitat present within the BSA to support hardhead (*Mylopharodon conocephalus*). This species is unlikely to occur within the BSA.

Amphibians:

There is no suitable breeding habitat or vernal pools present within the BSA to support California tiger salamander (*Ambystoma californiense*) or western spadefoot (*Spea hammondii*). The Project site has been cultivated and provides no suitable habitat to support these species.

Reptiles:

There are no native grasslands or native shrub habitats that would support blunt-nosed leopard lizard (*Gambelia sila*) within the BSA. There are no CNDDB records for this species within 10 miles of the BSA. This species is unlikely to occur within the BSA.

There is no suitable habitat for the Northern California legless lizard (*Anniella pulchra*), California glossy snake (*Arizona elegans occidentalis*), or coast horned lizard (*Phrynosoma blainvillii*) within the BSA. The nearest CNDDB occurrences for these species (EONDX 107017; 103150; 104841) are from 1880 and 1893. These species are unlikely to occur within the BSA.

Poor habitat and nesting areas for the northwestern pond turtle (*Actinemys marmorata*) exists within the BSA. There are no CNDDB records for this species within 10 miles of the BSA. This species is unlikely to occur within the BSA

Birds:

The BSA lacks suitable habitat for foraging and nesting tricolored blackbirds (*Agelaius tricolor*). The most recent CNDDB occurrence (EONDX 98806) is from 1975 and approximately 8.48 miles east of the Project site.

Western burrowing owls (*Athene cunicularia hypugaea*) inhabit grassland, open bare ground, and utilize existing small mammal burrows, typically created by California ground squirrels (*Otospermophilus beecheyi*), for breeding and shelter. There was no diagnostic sign (e.g., whitewash, tracks, prey remains) of burrowing owl observed during the site survey, although appropriately sized small mammal burrows are present within the BSA. Burrowing owls may be present as transient foragers and may inhabit appropriately sized burrows at any time. No CNDDB records of the western burrowing owl are recorded within 10 miles of the BSA. Implementation of Avoidance and Minimization Measures BIO-1 through BIO-5 , BIO -7 and BIO-9 would reduce or eliminate impacts to this species.

The BSA provides low quality nesting and moderate quality foraging habitat for Swainson's hawks (*Buteo swainsoni*). There are large trees located within the northern boundary of the BSA, outside of the Project site that could potentially support nesting raptors including Swainson's hawks, but no nests were observed during the survey. California ground squirrels and desert cottontails, both prey species, are numerous throughout the project site. The nearest CNDDB record (EONDX 91594) for Swainson's hawk is from 1956 and approximately 2.76 miles southeast of the Project site. Implementation of Avoidance and Minimization Measures BIO-1 BIO-3 and BIO-6 would reduce or eliminate impacts to this species.

The BSA does not provide suitable nesting and foraging habitat for western yellow-billed cuckoo (*Coccyzus americanus occidentalis*). There is one historic CNDDB record (EONDX 96983) from 1883 located 7.73 miles northeast of the Project site. The population from the record is presumed extirpated.

Mammals:

No suitable foraging or roosting habitat for bats exists within the BSA. Pallid bats (*Antrozous pallidus*) and mastiff bats (*Eumops perotis*) are unlikely to occur within the BSA.

Due to the historic and ongoing disturbance of small mammal burrows and lack of any sign, the BSA cannot support the Fresno kangaroo rat (*Dipodomys nitratoides exilis*). There is no connectivity of suitable habitat between the BSA for kangaroo rat species.

The American badger (*Taxidea taxus*) may be present as transient foragers within the BSA. No diagnostic sign (e.g., tracks, scat, prey remains) or potential dens are present within the BSA; however, California ground squirrels, a prey species for badgers, and burrow complexes are present throughout the BSA. The closest CNDDB record (EONDX 56599) is from 1988 and approximately 1.92 miles northeast of the Project site. Implementation of Avoidance and Minimization Measures BIO-1, BIO-3, BIO -4, BIO-8 and BIO-9 would reduce or eliminate impacts to this species.

The San Joaquin kit fox (*Vulpes macrotis mutica*) is unlikely to be present within the BSA. The nearest CNDDB record (EONDX 53873) is from 1993 and is 0.69 miles northeast of the Project site. The Project site lacks suitable habitat due to the past and current level of disturbance and the surrounding BSA has been similarly degraded. No San Joaquin kit fox, diagnostic sign (e.g., tracks, scat, prey remains), or potential dens were present within the BSA during the site survey. Implementation of Avoidance and Minimization Measures BIO-1, BIO-3, BIO -4 and BIO-9 would reduce or eliminate impacts to this species

4.3.3 - Nesting Migratory Birds and Raptors

There are five inactive mud swallow nests in the BSA outside of the Project site under Grantland Avenue bridge on the Herndon Canal. No other nests were observed, but suitable nesting habitat for mud nesting swallow species is present. The orchard area within the Project site presents suitable habitat for ground nesting species. Migratory birds and raptors could build nests in the large trees, utility poles, and residential landscaping in the BSA surrounding the Project site. Implementation of Avoidance and Minimization Measures BIO-1 through BIO-3, and BIO-9 would reduce or eliminate impacts to migratory bird species.

4.4 - Critical Habitat, Movement Corridors, and Linkages

4.4.1 - Presence of Critical Habitat

The BSA is not within any USFWS designated critical habitat. The closest critical habitat is located approximately 8.2 miles north of the BSA and is designated for San Joaquin Valley

Orcutt grass, hairy Orcutt grass, Fleshy owl's clover, vernal pool fairy shrimp, and California tiger salamander (Figure 4-1).

4.4.2 - Presence of Movement Corridors and Linkages

The BSA is not within any designated wildlife linkage or movement corridors. The nearest wildlife movement corridor is located approximately 15.38 miles northeast of the BSA and the nearest wildlife linkage area is approximately 17.50 miles northwest. The Project is in an area developed for urban and agricultural use and does not provide a linkage between suitable natural habitats for most wildlife species. Due to the disturbed condition of the Project and surrounding area, there is no substantial movement of wildlife onto or off the BSA.

4.5 - Wetlands and Other Waters

No wetland or non-wetland water features exist on the Project site. The NHD and NWI identify two water features in the surrounding BSA: Herndon Canal, which borders the north side of the Project site, and Epstein Canal, which flows into Herndon Canal from the north (Figure 3-1). The Project is designed to completely avoid these waterways, and neither water feature will be impacted.

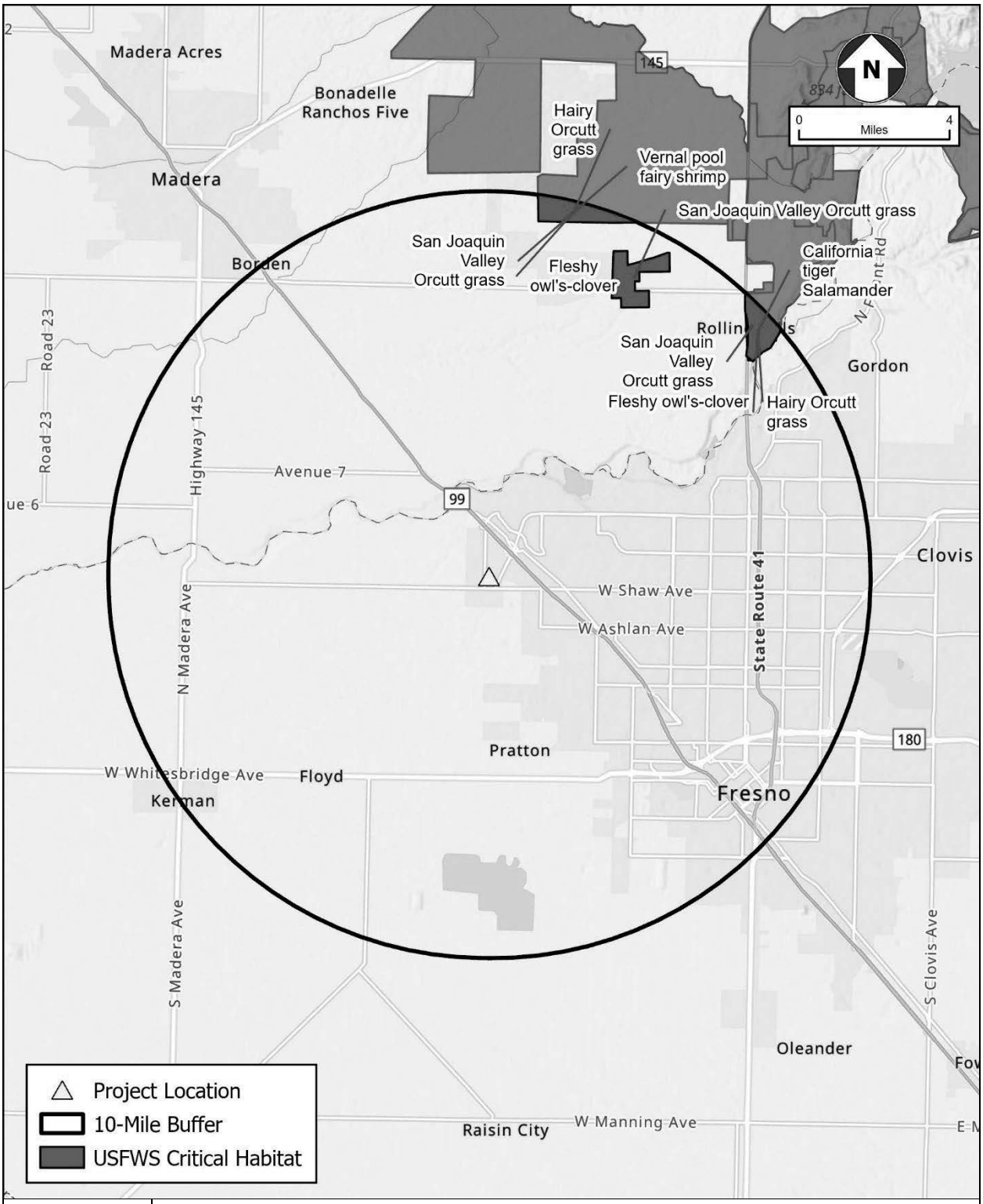


Figure 4-1
Mapped Critical Habitat in the Project Vicinity
VTTM 6294 Project, Fresno, California

SECTION 5 - POTENTIAL PROJECT IMPACTS

The purpose of this section is to present an evaluation of the potential for Project-related impacts to sensitive biological resources to occur resulting from Project construction activities. Although the potential for impacts of the Project is anticipated to be minor due to the current condition of the site, there are some risks of Project impacts. These are discussed below.

5.1 - Potential Impacts to Sensitive Vegetation Communities

No sensitive vegetation communities occur within the BSA. The Project would not impact sensitive natural communities.

5.2 - Potential Impacts to Special-Status Plant Species

No special-status plant species occur within the BSA and there is no suitable habitat for any special-status plant species on or near the BSA. The Project would not impact any special-status plant species.

5.3 - Potential Impacts to Special-Status Wildlife Species

Three special-status wildlife species; Swainson's hawk, western burrowing owl, and American badger have potential to occur within the BSA as transients. Nesting birds and raptors have the potential to occur on or near the Project site and surrounding the BSA during nesting season. Several burrows are located in the BSA that can be utilized by burrowing owls or American badgers, and these species may be a transient forager at any time. Avoidance and minimization measures listed below will eliminate or reduce project impacts to special-status species to a less than significant level.

Any special-status species that use the Project as a movement corridor or use the multiple dens and burrows located on the Project site or vicinity may be directly or indirectly impacted by Project activities.

5.4 - Potential Impacts to Nesting Birds and Raptors

The inactive swallow nests under the bridge may become active during the nesting season, but they will not be directly impacted by Project activities. The mud nesting swallows are located on the west side of the Grantland Ave bridge and are not in the visual line of site of Project site. Nearby construction activities will include noise, dust and other human disturbances which may impact nesting behavior if the project occurs during the nesting season. No other nests were observed within the BSA. There is potential for birds to nest on the ground in the orchard within the Project site or within trees located within the BSA but outside of the Project site. If there are active nests present during Project activities, nests could be impacted by Project activities that interfere with normal breeding behaviors, which could discourage breeding or lead to nest abandonment or failure. Avoidance and

minimization measures listed below will eliminate or reduce impacts to nesting birds to a less than significant level.

SECTION 6 - AVOIDANCE AND MINIMIZATION MEASURES

Avoidance and minimization measures have been developed for the Project to reduce or eliminate impacts to a less than significant level. The Project is anticipated to have no impacts on sensitive natural communities, special-status plants, wetlands and non-wetland water features, Critical Habitat, or migratory corridors. There is potential for Project activities to result in impacts to three of the special-status wildlife species and nesting birds and raptors listed in Sections 4 and 5. While the potential for impacts to special-status wildlife species is low, we recommend that the following be implemented as Avoidance and Minimization Measures BIO-1 through BIO-9 and Best Management Practices (BMPs) during Project activities:

BIO-1: Pre-Construction Survey: A pre-construction clearance survey of the Project footprint should be conducted for special-status wildlife species and nesting migratory birds and raptors. The survey should occur no less than 14 days prior to the start of construction activities. If construction is delayed beyond 30 days from the time of the survey, then another survey would need to be conducted. The survey should be conducted by a biologist with adequate training and prior experience conducting surveys for special-status wildlife species. If no special-status species are observed, no further action is warranted. If dens or burrows that could support special-status species and/or nesting birds and raptors are discovered during the pre-construction survey, appropriate avoidance buffers should be established. If no special-status species are observed on or near the Project site, no further surveys are required.

BIO-2: Nesting Bird Survey: If construction is planned during the nesting season for migratory birds (February 15 to August 31) and nesting birds are identified during the survey, active Swainson's hawk nest shall be avoided by 0.5 miles, other raptor nests shall be avoided by 500 feet and all other migratory bird nests shall be avoided by 250 feet. Avoidance buffers may be reduced if a qualified biological monitor determines that encroachment into the buffer area is not affecting nest building, the rearing of young, or otherwise affecting the breeding behaviors of the resident birds. Because nesting birds can establish new nests or produce a second or even third clutch at any time during the nesting season, nesting bird surveys shall be repeated every 30 days as construction activities are occurring throughout the nesting season. If no nesting birds are observed on or near the Project site, no further surveys are required.

BIO-3: Worker Environmental Awareness Program. A Worker Environmental Awareness Program shall be developed and implemented for all personnel that could access the site prior to commencing any disturbance activities. The program shall consist of an on-site or center presentation that will describe the locations and types of sensitive plant, wildlife, and sensitive natural communities (collectively, "Biological Resources") on and near the site, an overview of the laws and regulations governing the protection of Biological Resources, the reasons for protecting the Biological Resources, the specific protection and avoidance measures that are applicable to the site, and the identity of designated points of contact should questions or issues arise, including the qualified biologist. The program shall provide

training to recognize, avoid, and report to applicable qualified biologists any Biological Resources on the site.

a. The Worker Environmental Awareness Program shall emphasize the need to avoid contact with on-site wildlife and avoid entry into areas where Biological Resources have been identified based on pre-disturbance field surveys and to implement the buffer avoidance or other protection measures established by the United States Fish and Wildlife Service shall be identified California Department of Fish and Wildlife or required by the Biological Resource mitigation measures. The training shall emphasize the importance of not feeding or domesticating wildlife and the need to avoid any trash, micro trash, or potential food disposal on-site except in animal-proof containers emptied daily to avoid attracting or causing adverse impacts to special status wildlife.
b. All on-site personnel must sign a statement verifying that they have completed the Worker Environmental Awareness Program and that they understand and agree to implement the biological requirements for the worksite. If signed employee statements are not available, documentation may be provided by Worker Environmental Awareness Program training records, which shall be kept by the applicant for a minimum of five years. Each applicant shall maintain a list of all persons who have completed the training program and shall provide the list to the County or to State and federal wildlife agency representatives upon request.

BIO-4: Disturbance Buffers for Sensitive Resources: If protected or special-status species are identified on the Project site during pre-construction surveys, protective buffers shall be used, where effective in the opinion of the qualified biologist. These measures are created to avoid any unauthorized incidental take of these species and to minimize any incidental take. Protective buffers shall be delineated using brightly colored stakes and/or flagging or similar materials and remain until construction activities are complete, at which time of completion, the buffers must be removed. Protective buffers shall be established around active dens and/or burrows of special-status animal species or populations of special-status plant species to avoid unauthorized take of Protected Species as listed in the table below. The protective buffer distance shall be increased if required to avoid unauthorized incidental take of any Protected Species as determined by a qualified biologist. Protective buffer distances and other avoidance measures that may be implemented to avoid impacts to Protected Species or Sensitive Species must be consistent with the United States Fish and Wildlife Service and/or the California Department of Fish and Wildlife requirements and shall be implemented and overseen by the qualified biologist.

Table 6-1
Disturbance Buffers for Sensitive Resources

Sensitive Resource	Buffer Zone from Disturbance (feet)
Potential San Joaquin kit fox den	50
Known San Joaquin kit fox den	100
Natal San Joaquin kit fox den	500
Atypical San Joaquin kit fox den	50

Sensitive Resource	Buffer Zone from Disturbance (feet)
Rodent burrows	50
Special-status bird species' active nests	500 feet to 0.5 miles depending on species and sight line
American badger: Non-maternity dens	50
American badger: Maternity dens	200

BIO-5: Avoidance and Minimization Measures for Swainson's Hawk: If Project activities must occur during the Swainson's hawk nesting season (February 15 to September 31), pre-activity surveys should be conducted for Swainson's hawk nests in accordance with the *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California* (CDFW 2010). The surveys would be conducted on the Project site plus a 0.5-mile buffer. To meet the minimum level of protection for the species, surveys should be conducted during at least two survey periods prior to the start of construction. The survey will be conducted in accordance with the methodology outlined in existing protocols and should be phased with the construction of the Project.

If no Swainson's hawk nests are found, no further action is required.

BIO-6: Swainson's Hawk Nest Avoidance: If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist should complete an assessment of the potential for current construction activities to impact the nest. The assessment would consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this Project. Based on this assessment, the biologist will determine if construction activities can proceed and the level of nest monitoring required. Construction activities should not occur within 500 feet of an active nest, but depending upon conditions at the site, this distance may be reduced. Full-time monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist should have the authority to stop work if it is determined that Project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nesting Swainson's hawk to disturbances and at the discretion of the qualified biologist.

BIO-7: Standard Avoidance and Minimization Measures for Western Burrowing Owl: If burrows that could support this species are discovered during the pre-construction clearance survey conducted under Measure BIO-1, the avoidance buffers outlined below should be established, and burrow monitoring will be conducted in accordance with the California Department of Fish and Game (CDFG) *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). No work would occur within these buffers. If occupied burrowing owl burrows cannot be avoided by the appropriate buffer below, an ITP issued by the CDFW under the California Endangered Species Act (CESA) to authorize "take" that is incidental to an otherwise lawful activity, may be required before any work within the buffer.

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1 -Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16 – Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16- Mar 31	50 m	100 m	500 m

*Meters (m)

BIO-8: Avoidance and Minimization Measures for the Protection of American badger: Occupied American badger dens detected during pre-disturbance surveys shall be flagged, and ground-disturbing activities avoided within 50 feet of the den. Maternity dens shall be avoided, and a minimum 200-foot buffer from disturbance shall be maintained during the pup-rearing season (February 15 through July 1). Maternity dens must be avoided to the maximum extent feasible in the opinion of a qualified biologist. If an active maternity den is proposed to be disturbed, the qualified biologist shall consult with the California Department of Fish and Wildlife to identify any appropriate additional minimization measures which the qualified biologist determines, with the wildlife agencies, can actually be implemented based on field conditions. All such measures must be implemented for Project activities.

BIO-9: General Measures: The following additional measures shall be implemented to avoid and minimize potential significant adverse impacts to Protected and Sensitive Species:

a. All vehicles shall observe a 20-mile-per-hour speed limit in all areas of disturbance and on unpaved roads unless otherwise posted. Off-road traffic outside of designated access routes is prohibited. Speed limit signs shall be posted in visible locations at the point of site entry and at regular intervals on all unpaved access roads.
b. All disturbance activities, except emergency situations or drilling that may require continuous operations, shall only occur during daylight hours. Nighttime disturbance activity for drilling purposes shall use directed lighting and shielding methods and comply with applicable lighting mitigation measures.
c. All food-related trash items and all forms of micro trash, such as wrappers, cans, bottles, bottle tops, and food scraps, shall be disposed of in closed, animal-proof containers and removed daily from the site.
d. Excavations, spoils piles, access roadways, and parking and staging areas shall be subject to dust control as set forth in the dust control mitigation measures.
e. The use of herbicides for vegetation control shall be restricted to those approved by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife. No rodenticides shall be used on any site unless approved by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife and shall observe label and other restrictions mandated by the United States Environmental Protection Agency, California Department of Food and Agriculture, and State and federal laws and regulations. For split estates, no herbicides for vegetation control may occur in Tier 2 areas without surface owner approval.
f. No plants or wildlife shall be collected, taken, or removed from the site or any adjacent locations except as necessary for Project-related vegetation removal or

wildlife relocation by a qualified biologist and subject to all applicable permits and authorizations.

g. All open trenches or excavations shall be covered at the end of each workday to prevent wildlife entrapment. If an excavation is too large to cover, escape ramps shall be installed at an incline ratio of no greater than 2:1. All trenches and pipes shall be inspected for the presence of wildlife each day prior to the commencement of work.
h. To enable San Joaquin kit foxes and other wildlife to pass through the Project site, any perimeter fencing shall include a four- to eight-inch opening between the fence mesh and the ground, or the fence shall be raised four inches above the ground except blunt-nosed leopard lizard exclusion fencing. The bottom of the fence fabric shall be knuckled (wrapped back to form a smooth edge) to protect wildlife.
i. All vertical tubes used in Project construction and chain link fencing poles shall be temporarily or permanently capped to avoid the entrapment and death of special-status wildlife and birds. All pipes 1.5 inches or greater in diameter stored overnight on a Project location must have end caps or other physical barriers that prevent wildlife from entering the pipe.
j. All dead or injured special-status wildlife shall be left in place and reported to the United States Fish and Wildlife Service and the California Department of Fish and Wildlife within 48 hours of discovery for rescue or salvage. Discovery of State or federal listed species that are injured or dead shall also be managed consistent with regulatory requirements, including being reported immediately via telephone and within 24 hours in writing, and with a copy to City of Fresno Planning Division.
k. All drilling installations and operations will comply at all times with the applicable federal, State, County, and local law ordinances and regulations.
l. During pre-construction surveys, the qualified biologist shall delineate previously disturbed areas to be used by the applicant to minimize the amount of new disturbance.
m. All concrete and asphalt debris should be removed from the site for recycling or disposal at an authorized, permitted facility.
n. No vehicles or construction equipment shall be parked within a wetland or waterbody/dry wash.
o. Tracked vehicles and other construction equipment must be washed or maintained to be weed-free prior to entering and working within areas of a new disturbance.
p. All washing of trucks, paint, equipment, or similar activities should occur in areas where runoff is fully contained for collection and off-site disposal. Wash water may not be discharged from the site and shall be located at least 100 feet from any water body or sensitive Biological Resources.
q. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries or waterbody, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.
r. All areas that must be avoided as a result of the pre-disturbance surveys and areas where new disturbance will occur shall be clearly delineated by fencing or staking and flagging and/or rope or cord.
s. No pets shall be allowed on any site.
t. No smoking may occur except in designated areas.

SECTION 7 - SUMMARY AND CONCLUSIONS

Land within the Project site is disturbed by agriculture but contains low quality habitat that may support special-status wildlife species and nesting birds. No special status plant species or sensitive natural communities were observed or have potential to occur within the Project site. There are no designated Critical Habitats or movement corridors that would be impacted by the Project. The Project has been designed to completely avoid the water features Herndon Canal and Epstein Canal. Therefore, impacts to these waterways will not occur as a result of the Project development.

Based on the literature and database searches and results of the site survey, there is potential for three special-status species to occur on the site: Swainson's hawk, western burrowing owl, and American badger. Nesting birds and raptors have the potential for occurrence on or near the Project site. Implementation of the recommended BMPs and avoidance and minimization measures BIO-1 through BIO- 9 as outlined in Section 6 would reduce or eliminate any Project impacts to these species.

This Biological Resource Evaluation report has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The findings and opinions conveyed in this report are based on findings derived from specified historical and literary sources and a biological survey of the Project site and surrounding area. The biological investigation was limited by the scope of work performed. The biological survey may not have been performed during blooming periods or periods of seasonal or daily wildlife activity that would provide positive identification if resources were present, and therefore the findings of this report might not be definitive. The biological survey was also limited by the environmental conditions present at the time of the survey. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the site. Mobile animal species could occupy the site on a transient basis or re-establish populations in the future. No other guarantees or warranties, expressed or implied, are provided.

SECTION 8 - REFERENCES

California Department of Fish and Wildlife (CDFW). 2025a. California Natural Diversity Database (CNDDB), Accessed via: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx.

California Department of Fish and Wildlife (CDFW). 2025b. Biogeographic Information and Observation System (BIOS). Accessed via: www.wildlife.ca.gov/data/BIOS.

California Department of Fish and Wildlife (CDFW). 2025c. CDFW's Special Animals List

California Native Plant Society (CNPS). 2025. Inventory of Rare and Endangered Plants. Accessed via: www.rareplants.cnps.org.

Federal Emergency Management Agency (FEMA) 2025. On-line Map Service Center.

Google LLC. 2025. Google Earth Pro.

Mayer, K.E. and W.F. Laudenslayer, Jr. 1988. *A guide to wildlife habitats of California. State of California*. Resources Agency, Department of Fish and Game. Sacramento, CA. 166 pp. Accessed via: https://www.wildlife.ca.gov/Data/CWHR/Wildlife-Habitats.

United States Department of Agriculture, Natural Resources Conservation Service (NRCS). 2025. Web Soil Survey. Accessed via: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

United States Fish and Wildlife Service (USFWS). 2025a. Information for Planning and Consultation (IPaC) online project planning tool. Accessed via: https://ecos.fws.gov/ipac/.

United States Fish and Wildlife Service (USFWS). 2025b. Critical Habitat Portal. Accessed via: https://ecos.fws.gov/ecp/report/table/critical-habitat.html.

United States Fish and Wildlife Service (USFWS). 2025c. National Wetlands Inventory Wetlands Mapper (NWI). U.S. Geological Survey.

United States Geological Survey (USGS). 2025. National Hydrography Dataset (NHD). Accessed via: https://www.usgs.gov/core-science-systems/ngp/national-hydrography.

Western Regional Climate Center (WRCC). 2025. Cooperative Climatological Data Summaries, NOAA Cooperative Station Fresno Yosemite INTL AP, California (043257). Accessed via: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3257.

APPENDIX A

SPECIAL-STATUS SPECIES DATABASE SEARCH RESULTS

VTTM 6294 PROJECT

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: 06/18/2025 18:31:06 UTC
Project Code: 2025-0111284
Project Name: Clement Ranch

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

PROJECT SUMMARY

Project Code: 2025-0111284
Project Name: Clement Ranch
Project Type: Residential Construction
Project Description: The Project site is located southeast of the City of Visalia (City), adjacent to the city limits (Urban Growth Boundary II). The site consists of two separate APNs, which total roughly 75 acres. These parcels will be developed by D.R. Horton into homes.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.3031601,-119.25803373631454,14z



Counties: Tulare County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Buena Vista Lake Ornate Shrew *Sorex ornatus relictus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1610	Endangered
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered
Tipton Kangaroo Rat *Dipodomys nitratoides nitratoides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7247	Endangered

BIRDS

NAME	STATUS
California Condor *Gymnogyps californianus* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	Endangered

REPTILES

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Northwestern Pond Turtle *Actinemys marmorata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

AMPHIBIANS

NAME	STATUS
Western Spadefoot *Spea hammondii* Population: Northern DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRUSTACEANS

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi*	Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/498

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: QK
Name: Mattole Whitaker
Address: 601 E Pollasky Ave Suite 301
City: Clovis
State: CA
Zip: 93612
Email mattole.whitaker@qkinc.com
Phone: 5594492400

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE **RareFind**

Query Summary:
Quad IS (Visalia (3611933) OR Monson (3611943) OR Traver (3611944) OR Goshen (3611934) OR Paige (3611924) OR Tulare (3611923) OR Cairns Corner (3611922) OR Exeter (3611932) OR Ivanhoe (3611942))

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Actinemys marmorata	northwestern pond turtle	Reptiles	ARAAD02031	1160	1	Proposed Threatened	None	G2	SNR	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	null
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	960	1	None	Threatened	G1G2	S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Ambystoma californiense pop. 1	California tiger salamander - central California DPS	Amphibians	AAAAA01181	1329	7	Threatened	Threatened	G2G3T3	S3	null	CDFW_WL-Watch List, IUCN_VU-Vulnerable	Cismontane woodland, Meadow & seep, Riparian woodland, Valley & foothill grassland, Vernal pool, Wetland
Andrena macswaini	An andrenid bee	Insects	IIHYM35130	7	1	None	None	G2	S2	null	null	null
Anniella pulchra	Northern California legless lizard	Reptiles	ARACC01020	386	2	None	None	G3	S2S3	null	CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	Chaparral, Coastal dunes, Coastal scrub
Antrozous pallidus	pallid bat	Mammals	AMACC10010	425	1	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive	Chaparral, Coastal scrub, Desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Riparian woodland, Sonoran desert scrub,

												Upper montane coniferous forest, Valley & foothill grassland
Athene cunicularia	burrowing owl	Birds	ABNSB10010	2133	10	None	Candidate Endangered	G4	S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Atriplex cordulata var. cordulata	heartscale	Dicots	PDCHE040B0	66	1	None	None	G3T2	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland
Atriplex cordulata var. erecticaulis	Earlimart orache	Dicots	PDCHE042V0	23	4	None	None	G3T1	S1	1B.2	BLM_S-Sensitive	Valley & foothill grassland
Atriplex depressa	brittlescale	Dicots	PDCHE042L0	60	2	None	None	G2	S2	1B.2	null	Alkali playa, Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool, Wetland
Atriplex minuscula	lesser saltscale	Dicots	PDCHE042M0	52	8	None	None	G2	S2	1B.1	SB_CalBG/RSABG-California/ Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Valley & foothill grassland
Atriplex persistens	vernal pool smallscale	Dicots	PDCHE042P0	41	2	None	None	G2	S2	1B.2	null	Vernal pool, Wetland
Atriplex subtilis	subtle orache	Dicots	PDCHE042T0	24	2	None	None	G1	S1	1B.2	BLM_S-Sensitive	Valley & foothill grassland
Bombus crotchii	Crotch's bumble bee	Insects	IIHYM24480	640	1	None	Candidate Endangered	G2	S2	null	IUCN_EN-Endangered	null
Bombus pensylvanicus	American bumble bee	Insects	IIHYM24260	810	3	None	None	G3G4	S2	null	IUCN_VU-Vulnerable	Coastal prairie, Great Basin grassland, Valley & foothill grassland
Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	ICBRA03030	804	14	Threatened	None	G3	S3	null	IUCN_VU-Vulnerable	Valley & foothill grassland, Vernal pool, Wetland
Buteo swainsoni	Swainson's hawk	Birds	ABNKC19070	2585	34	None	Threatened	G5	S4	null	BLM_S-Sensitive, IUCN_LC-Least Concern	Great Basin grassland, Riparian forest, Riparian woodland, Valley &

												foothill grassland
Caulanthus californicus	California jewelflower	Dicots	PDBRA31010	67	1	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/ Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley	Chenopod scrub, Pinon & juniper woodlands, Valley & foothill grassland
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Birds	ABNRB02022	165	1	Threatened	Endangered	G5T2T3	S1	null	BLM_S-Sensitive, USFS_S-Sensitive	Riparian forest
Delphinium recurvatum	recurved larkspur	Dicots	PDRAN0B1J0	119	4	None	None	G2?	S2	1B.2	BLM_S-Sensitive, SB_SBBG-Santa Barbara Botanic Garden	Chenopod scrub, Cismontane woodland, Valley & foothill grassland
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	Insects	IICOL48011	271	1	Threatened	None	G3T3	S3	null	null	Riparian scrub
Dipodomys nitratoides nitratoides	Tipton kangaroo rat	Mammals	AMAFD03152	81	1	Endangered	Endangered	G2T1T2	S2	null	IUCN_VU-Vulnerable	Chenopod scrub
Eryngium spinosepalum	spiny-sepaled button-celery	Dicots	PDAPI0Z0Y0	108	7	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_SBBG-Santa Barbara Botanic Garden	Valley & foothill grassland, Vernal pool, Wetland
Eumops perotis californicus	western mastiff bat	Mammals	AMACD02011	296	2	None	None	G4G5T4	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Euphorbia hooveri	Hoover's spurge	Dicots	PDEUP0D150	29	5	Threatened	None	G1	S1	1B.2	null	Vernal pool, Wetland
Great Valley Valley Oak Riparian Forest	Great Valley Valley Oak Riparian Forest	Riparian	CTT61430CA	33	1	None	None	G1	S1.1	null	null	Riparian forest
Helianthus winteri	Winter's sunflower	Dicots	PDAST4N260	55	7	None	None	G2?	S2?	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/ Rancho Santa Ana Botanic Garden	Cismontane woodland, Valley & foothill grassland
Imperata brevifolia	California satintail	Monocots	PMPOA3D020	32	1	None	None	G3	S3	2B.1	SB_CalBG/RSABG-California/ Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden, USFS_S-Sensitive	Chaparral, Coastal scrub, Meadow & seep, Mojavean desert scrub, Riparian scrub, Wetland

Lanius ludovicianus	loggerhead shrike	Birds	ABPBR01030	110	1	None	None	G4	S4	null	CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened	Broadleaved upland forest, Desert wash, Joshua tree woodland, Mojavean desert scrub, Pinon & juniper woodlands, Riparian woodland, Sonoran desert scrub
Lasthenia chrysantha	alkali-sink goldfields	Dicots	PDAST5L030	55	6	None	None	G2	S2	1B.1	null	Vernal pool
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Dicots	PDAST5L0A1	109	1	None	None	G4T2	S2	1B.1	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Alkali playa, Marsh & swamp, Salt marsh, Vernal pool, Wetland
Lepidurus packardi	vernal pool tadpole shrimp	Crustaceans	ICBRA10010	336	9	Endangered	None	G3	S3	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
Linderiella occidentalis	California linderiella	Crustaceans	ICBRA06010	508	4	None	None	G2G3	S2S3	null	IUCN_NT-Near Threatened	Vernal pool
Lithobates pipiens	northern leopard frog	Amphibians	AAABH01170	19	2	None	None	G5	S2	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Freshwater marsh, Great Basin flowing waters, Great Basin standing waters, Marsh & swamp, Wetland
Lytta hoppingi	Hopping's blister beetle	Insects	IICOL4C010	5	1	None	None	G1G2	S2	null	null	null
Northern Claypan Vernal Pool	Northern Claypan Vernal Pool	Herbaceous	CTT44120CA	21	1	None	None	G1	S1.1	null	null	Vernal pool, Wetland
Northern Hardpan Vernal Pool	Northern Hardpan Vernal Pool	Herbaceous	CTT44110CA	126	3	None	None	G3	S3.1	null	null	Vernal pool, Wetland
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Monocots	PMPOA4G060	47	2	Threatened	Endangered	G1	S1	1B.1	null	Vernal pool, Wetland
Pseudobahia peirsonii	San Joaquin adobe sunburst	Dicots	PDAST7P030	51	1	Threatened	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Cismontane woodland, Valley & foothill grassland
Puccinellia simplex	California alkali grass	Monocots	PMPOA53110	80	5	None	None	G2	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool

Sagittaria sanfordii	Sanford's arrowhead	Monocots	PMALI040Q0	143	2	None	None	G3	S3	1B.2	BLM_S-Sensitive	Marsh & swamp, Wetland
Spea hammondii	western spadefoot	Amphibians	AAABF02020	1445	30	Proposed Threatened	None	G2G3	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened	Cismontane woodland, Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland
Talanites moodyae	Moody's gnaphosid spider	Arachnids	ILARA98020	6	3	None	None	G2G3	S2S3	null	null	Ultramafic
Taxidea taxus	American badger	Mammals	AMAJF04010	648	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Alkali marsh, Alkali playa, Alpine, Alpine dwarf scrub, Bog & fen, Brackish marsh, Broadleaved upland forest, Chaparral, Chenopod scrub, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Desert dunes, Desert wash, Freshwater marsh, Great Basin grassland, Great Basin scrub, Interior dunes, Ione formation, Joshua tree woodland, Limestone, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Mojavean desert scrub, Montane dwarf scrub, North coast coniferous forest, Oldgrowth, Pavement plain,

												Redwood, Riparian forest, Riparian scrub, Riparian woodland, Salt marsh, Sonoran desert scrub, Sonoran thorn woodland, Ultramafic, Upper montane coniferous forest, Upper Sonoran scrub, Valley & foothill grassland
Valley Sacaton Grassland	Valley Sacaton Grassland	Herbaceous	CTT42120CA	9	2	None	None	G1	S1.1	null	null	Valley & foothill grassland
Vulpes macrotis mutica	San Joaquin kit fox	Mammals	AMAJA03041	1020	21	Endangered	Threatened	G4T2	S3	null	null	Chenopod scrub, Valley & foothill grassland

CALIFORNIA NATIVE PLANT SOCIETY

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▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Atriplex cordulata var. *cordulata*	heartscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G3T2	S2	1B.2	Yes	1988-01-01	 © 1994 Robert E. Preston, Ph.D.
Atriplex cordulata var. *erecticaulis*	Earlimart orache	Chenopodiaceae	annual herb	Aug-Sep(Nov)	None	None	G3T1	S1	1B.2	Yes	2001-01-01	 © 2009 Robert E. Preston, Ph.D.
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	Yes	1994-01-01	 © 2009 Zoya Akulova
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	None	None	G2	S2	1B.1	Yes	1994-01-01	 © 2000 Robert E. Preston, Ph.D.
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	Jun-Oct	None	None	G2	S2	1B.2	Yes	2001-01-01	No Photo Available

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Atriplex subtilis	subtle orache	Chenopodiaceae	annual herb	(Apr)Jun-Sep(Oct)	None	None	G1	S1	1B.2	Yes	1994-01-01	 © 2000 Robert E. Preston, Ph.D.
Caulanthus californicus	California jewelflower	Brassicaceae	annual herb	Feb-May	FE	CE	G1	S1	1B.1	Yes	1984-01-01	No Photo Available
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	None	None	G2?	S2	1B.2	Yes	1988-01-01	No Photo Available
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual/ perennial herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	1980-01-01	No Photo Available
Euphorbia hooveri	Hoover's spurge	Euphorbiaceae	annual herb	(May-Jun)Jul-Sep(Oct)	FT	None	G1	S1	1B.2	Yes	1974-01-01	 © 2020 Neal Kramer
Helianthus winteri	Winter's sunflower	Asteraceae	perennial shrub	Jan-Dec	None	None	G2?	S2?	1B.2	Yes	2014-10-15	 © 2014 Chris Winchell
Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	Sep-May	None	None	G3	S3	2B.1		2006-12-26	 © 2020 Matt C. Berger
Lasthenia chrysantha	alkali-sink goldfields	Asteraceae	annual herb	Feb-Apr	None	None	G2	S2	1B.1	Yes	2019-09-30	 © 2009 California State University, Stanislaus

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	None	None	G4T2	S2	1B.1		1994-01-01	 © 2013 Keir Morse
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Poaceae	annual herb	Apr-Sep	FT	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Pseudobahia peirsonii	San Joaquin adobe sunburst	Asteraceae	annual herb	Feb-Apr	FT	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	None	None	G2	S2	1B.2		2015-10-15	 © 2017 Chris Winchell
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	Yes	1984-01-01	 ©2013 Debra L. Cook

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APPENDIX B

REPRESENTATIVE PHOTOGRAPHS

VTTM 6294 PROJECT



Photograph 1. View of Project Site from northwest corner.
Coordinates: 36.814706°N, -119.916428 °W facing southeast.
Photograph taken by Eric Madueno on October 15, 2025.



Photograph 2. View of Project Site from northeast corner.
Coordinates: 36.812948°N, -119.912092 °W facing southwest.
Photograph taken by Eric Madueno on October 15, 2025.



Photograph 3. View of Project Site from southeast corner.
Coordinates: 36.811622°N, -119.912145 °W facing northwest.
Photograph taken by Eric Madueno on October 15, 2025.



Photograph 4. View of Project Site from southwest corner.
Coordinates: 36.811719°N, -119.916428 °W facing northeast.
Photograph taken by Eric Madueno on October 15, 2025.



Photograph 5. Unmaintained grassland habitat within BSA.
Coordinates: 36.812974 °N, -119.914464 °W facing east.
Photograph taken by Eric Madueno on October 15, 2025.



Photograph 6. Potential coyote den within Project Site.
Coordinates: 36.812208 °N, -119.914642 °W facing east.
Photograph taken by Eric Madueno on October 15, 2025.



Photograph 7. California ground squirrel burrows present in Project Site.
Coordinates: 36.814097 °N, -119.914751 °W facing southeast.
Photograph taken by Eric Madueno on October 15, 2025.

APPENDIX C

PLANT AND WILDLIFE SPECIES OBSERVED

VTTM 6294 PROJECT

Table C - 1
Plant and Wildlife Species Observed within the BSA

Scientific Name	Common Name	Status
Plants		
Amsinckia intermedia	common fiddleneck	None
Centromadia pungens	common tarweed	None
Cynodon dactylon	Bermuda grass	None
Datura wrightii	jimsonweed	None
Dittrichia graveolens	stinkwort	None
Hirschfeldia incana	shortpod mustard	None
Murdannia nudiflora	doveweed	None
Pyrus calleryana	Callery pear	None
Quercus lobata	valley oak	None
Salix gooddingii	Goodding's willow	None
Ornamental shrubs/trees		None
Birds		
Aphelocoma californica	California scrub jay	None
Branta canadensis	Canada goose	None
Buteo jamaicensis	red-tailed hawk	None
Cathartes aura	turkey vulture	None
Charadrius vociferus	killdeer	None
Columba livia	rock dove	None
Corvus corax	common raven	None
Haemorhous mexicanus	house finch	None
Mimus polyglottos	Northern mockingbird	None
Passer domesticus	house sparrow	None
Passerculus sandwichensis	Savannah sparrow	None
*Petrochelidon pyrrhonota**	cliff swallow	None
Sturnella neglecta	western meadowlark	None
Sturnus vulgaris	European starling	None
Zenaida macroura	mourning dove	None
Mammals		
*Canis familiaris**	domestic dog	None
*Canis latrans**	coyote	None
*Peromyscus maniculatus**	deer mouse	None
Otospermophilus beecheyi	California ground squirrel	None
Sylvilagus audubonii	desert cottontail	None

* Indicates that only sign (e.g., tracks, scat, burrows, dens, vocalizations) of the species was observed.

APPENDIX D

SPECIAL-STATUS SPECIES DATABASE SEARCH RESULTS AND EVALUATION TABLE

Table D-1
Special-Status Plant and Wildlife Species in the Regional Vicinity of the Project Site
Commercial Development at 7th Standard Road and Calloway Drive, Kern County, California

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
Sensitive Natural Communities				
Great Valley Mixed Riparian Forest	-/- -/-	This community consists of medium to tall (to 100 feet), broad-leaved winter-deciduous trees. This community usually occupies sites that are farther from the active river channel or that are at somewhat higher elevations.	No	Suitable habitat for this community is absent from the Project site. There are no CNDDB records within 10 miles of the Project site.
Northern Claypan Vernal Pool	-/- -/-	This community consists of a low, herbaceous community dominated by annual herbs and grasses. Germination and growth begin with winter rains, often continuing even when inundated. Rising spring temperatures evaporate the pools, leaving concentric bands of vegetation. Claypan vernal pools are typically small and contain less cover than northern hardpan vernal pools.	No	Suitable habitat for this community is absent from the Project site. The only CNDDB recorded occurrence (EONDX 26474) within 10 miles of the Project site is from 1980 and approximately 6.83 miles northeast of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
Northern Hardpan Vernal Pool	-/- -/-	This community occurs on old, very acidic, Fe-Si cemented hardpan soils (Redding, San Joaquin, and similar series). The microrelief on these soils typically is hummocky, with mounds intervening between localized depressions. Winter rainfall perches on the hardpan, forming pools in the depressions. Evaporation (not runoff) empties pools in the spring.	No	Suitable habitat for this community is absent from the Project site. The only CNDDB recorded occurrence (EONDX 6673) within 10 miles of the Project site is from 1986 and approximately 5.0 miles northeast of the Project site.
Plants				
Atriplex cordulata var. *cordulata* heartscale	-/- 1B.2/-	This is an annual herb that is endemic to California and blooms from April to October. It occurs in saline and alkaline soils, chenopod scrub, meadows and seeps, and sandy soils in valley foothill grassland habitats. It occurs at elevations ranging from sea level to approximately 1,835 feet and is known to occur in Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Madera, Merced, San Joaquin, Solano, Stanislaus, Tulare, and Yolo counties. This species is threatened by competition from non-native plants and possibly threated by trampling.	No	Suitable habitat for this species is absent from the BSA. There are no CNDDB records within 10 miles of the Project site.
Atriplex minuscula lesser saltscale	-/- 1B.1/-	This is an annual herb that is endemic to California and blooms between May and October. It occurs on alkaline and sandy soils in chenopod scrub, playas, and valley and	No	Suitable habitat for this species is absent from the BSA. There are no CNDDB records within 10 miles of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		foothill grassland. It occurs at elevations ranging from 50 to 655 feet and is known to occur in Alameda, Butte, Fresno, Kings, Kern, Madera, Merced, Stanislaus, and Tulare counties. It is threatened by agriculture and solar energy development; documented primarily on Central Valley floor with some lower foothill occurrences.		
Caulanthus californicus California jewelflower	FE/SE 1B.1/-	This is an annual herb that blooms between February and May. It occurs in slightly alkaline sandy soils in chenopod scrub, valley and foothill grassland, and pinyon and juniper woodland, typically at elevations from approximately 200 to 3,280 feet. It occurs in the San Joaquin Valley, Carrizo Plain, and Cuyama Valley from Fresno County south to Santa Barbara County and many occurrences are presumed extirpated. It is threatened by development, grazing, and competition from non-native plants.	No	Suitable habitat for this species is absent from the BSA. The only CNDDB recorded occurrence (EONDX 63230) within 10 miles of the Project site is from 1986 and presumed extirpated.
Chloropyron palmatum palmate-bracted bird's beak	FE/SE 1B.1/-	This is an annual herb that blooms from May to October. It occurs on alkaline soils (usually Pescadero silty clay) in chenopod scrub, valley and foothill grasslands, meadows and seeps, and wetlands at elevations under 500 feet. It is threatened by	No	Suitable habitat for this species is absent from the BSA. There are no CNDDB records within 10 miles of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		agriculture, urbanization, vehicles, altered hydrology, grazing, and development.		
Delphinium recurvatum recurved larkspur	-/- 1B.2/-	This is a perennial herb that blooms between March and June. It occurs in alkaline conditions in chenopod scrub, cismontane woodland, and valley and foothill grassland. It occurs at elevations ranging from approximately 10 to 2,590 feet. This species is endemic to California. It occurs throughout the Central Valley and Coast Ranges from Butte County south. Few occurrences are in the Antelope Valley. This species is threatened by agriculture and competition from non-native plants.	No	Suitable habitat for this species is absent from the BSA. There are no CNDDB records within 10 miles of the Project site.
Eryngium spinosepalum spiny-sepaled button-celery	-/- 1B.2/-	This annual-to-perennial herb is endemic to California and blooms between April and June. It occurs in vernal pools and mesic grassland in the Central Valley and foothills between 260 and 3,200 feet. It has been documented primarily in the foothills of the Sierra Nevada mountains with scattered occurrences on the Central Valley floor and western foothills and lower mountains. The species is threatened by development, grazing, road maintenance, hydrological alterations, and agriculture.	No	Suitable habitat for this species is absent from the BSA. There are no CNDDB records within 10 miles of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
Imperata brevifolia California satintail	-/- 2B.1/-	This perennial rhizomatous herb blooms between September and May. It occurs in chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps, and riparian scrub on mesic or alkali soils. It is found at elevations from approximately sea level up to 3,985 feet. The species is threatened by development and agriculture.	No	Suitable habitat for this species is absent from the BSA. The only CNDDB recorded occurrence (EONDX 69854) within 10 miles is from 1893 and approximately 7.80 miles southeast of the Project site.
Lasthenia chrysantha alkali-sink goldfields	-/- 1B.2/-	This California endemic annual herb blooms between February and April. It occurs on alkaline soils in vernal pools and on wet saline flats at elevations of 655 feet and lower. It has been documented in the Central Valley from Sacramento south to Bakersfield and in the foothills on the western margin of the Valley. Threats to the species include habitat loss, agriculture, urbanization, and development.	No	Suitable habitat for this species is absent from the BSA. The closest CNDDB occurrence (EOINDX 118682) is from 1936 and approximately 8.92 miles southwest of the Project site. It is listed as possibly extirpated.
Layia munzii Munz's tidy-tips	-/- 1B.2/-	This is an annual herb endemic to California that blooms from March to April. It occurs in chenopod scrub and valley and foothill grassland. It occurs at elevations from approximately 492 to 2,297 feet. It is threatened by non-native plants and it possibly threatened by vehicles and foot traffic.	No	Suitable habitat for this species is absent from the BSA. There are no CNDDB records within 10 miles of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
Leptosiphon serrulatus Madera leptosiphon	-/- 1B.2/-	This is an annual herb endemic to California that blooms between April and May. It occurs on dry slopes and often on decomposed granite in cismontane woodland and lower montane coniferous forest. It occurs at elevations from approximately 985 to 4,265 feet. It is threatened by road maintenance, exotic plant control, and erosion.	No	
Navarretia myersii ssp. myersii pincushion navarretia	-/- 1B.1/-	This is an annual herb endemic to California that blooms from April to May. It often occurs in acidic conditions within vernal pools at elevations from approximately 65 to 1,080 feet. It is documented primarily on Sierra Nevada foothills from Merced County north and is threatened by development and possibly threatened by non-native plants.	No	Suitable habitat for this species is absent from the BSA. There are no CNDDB recorded occurrences for this species within 10 miles of the BSA.
Orcuttia inaequalis San Joaquin Valley Orcutt grass	FT/SE 1B.1/-	This is an annual herb endemic to California that blooms from April to September. It occurs in vernal pools at elevations from approximately 32 to 2,500 feet. It is documented primarily on the eastern Central Valley floor and foothills from Visalia north and is seriously threatened by agriculture, development, overgrazing, channelization, and non-native plants.	No	Suitable habitat for this species is absent from the BSA. The closest CNDDB occurrence (EONDX 22388) is from 1927 and approximately 7.45 miles northeast of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
Orcuttia pilosa hairy Orcutt grass	FE/SE 1B.1/-	This is an annual herb endemic to California that blooms from May to September. It often occurs in acidic and saline-alkaline soils in vernal pools at elevations from approximately 150 to 655 feet. It is only known from a few locations on the Central Valley floor and lower foothills in Madera, Merced, and Stanislaus counties, and the very northern portion of the valley in Butte, Glenn, and Tehama counties. It is seriously threatened by agriculture, urbanization, overgrazing, non-native plants, and trampling.	No	Suitable habitat for this species is absent from the BSA. The closest CNDDB occurrence (EONDX 32752) is from 1986 and approximately 4.12 miles north of the Project site.
Puccinellia simplex California alkali grass	-/- 1B.2/-	This is an annual grass that blooms between March and May. It usually occurs on sinks, flats, and lake margins in vernally moist, alkaline conditions of chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools. It occurs at elevations from approximately 5 to 3,050 feet. It is threatened by hydrological alterations, urbanization, agricultural conversion, development, and habitat fragmentation, disturbance alteration and loss. It is potentially threatened by solar energy development and is possibly threatened by grazing and proximity to roads.	No	Suitable habitat for this species is absent from the BSA. The closest CNDDB occurrence (EONDX 100171) is from 1936 and approximately 8.94 miles southwest of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
Sagittaria sanfordii Sanford's arrowhead	-/- 1B.2/-	This is an emergent perennial rhizomatous herb endemic to California that blooms from May to October, and sometimes into November. It occurs in sandy loam and clay soils of assorted shallow freshwater marshes and swamps and slow-moving waterways. It occurs at elevations from approximately sea level to 2,130 feet. It is thought to be extirpated from southern California and mostly extirpated from the Central Valley. It is threatened by grazing, development, recreational activities, non-native plants, road widening, and channel alteration and maintenance.	No	The BSA was surveyed during the blooming period for Sanford's arrowhead, but no plants were observed. Suitable habitat for this species is absent from the BSA, as the banks of Herndon canal are concrete lined or armored with rock slope protection. The closest CNDDB occurrence (EONDX 121181) is from 2020 and approximately 0.56 miles south of the Project site; however, the occurrence was within an irrigation canal that lacked armoring.
Invertebrates				
Bombus crotchii Crotch's bumble bee	-/SCE -/-	This bee occurs in relatively warm and dry environments, including the inner Coast Range of California and the margins of the Mojave Desert. It inhabits grassland and scrub habitats, where it nests in abandoned rodent burrows, occasionally nesting above ground in tufts of grass, rock piles, or cavities in dead trees. This species is classified as a short-tongued species, whose food plants include *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia,* and *Salvia*. The species is threatened by habitat loss and	No	Although the survey was not done during the optimal blooming period, none of the primary plant species that the Crotch's bumble bee feeds on were observed within the BSA during the survey or through historical imagery. The dead trees and small mammal burrows present within the BSA offer low quality nesting habitat, but there is no suitable foraging

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		degradation, including agricultural intensification and rapid urbanization.		habitat in or near the BSA. The closest CNDDB record (EONDX 98701) is from 2019 and approximately 5.57 miles east of the Project site.
Branchinecta lynchi vernal pool fairy shrimp	FT/- -/-	Occur a variety of vernal pool habitats that range from small, clear pools to large, turbid and alkaline pools; more common in pools less than 0.05 acre, typically as part of larger vernal pool complexes; adults active from early December to early May; pools must hold water for at least 18 days, the minimum to complete the life cycle if temperatures are optimal; eggs laid in spring and persist through dry season as cysts; current California distribution includes the Central Valley and coast ranges; threatened by habitat loss, degradation, and fragmentation, and interference with vernal pool hydrology.	No	There is no vernal pool habitat in the BSA. The closest CNDDB occurrence (EONDX 95307) is from 2006 and approximately 7.04 miles northeast of the Project site
Danaus plexippus monarch butterfly	FPT/- -/-	This butterfly species occurs in various open habitats including fields, meadows, weedy areas, marshes, and roadsides. Adults make massive migrations from August to October, flying thousands of miles south to hibernate along the California coast and in central Mexico. Eggs are laid and larvae feed on plants in the milkweed family, primarily *Asclepias* sp., but also other genera including	No	No suitable breeding habitat is present within the BSA or nearby. There are no CNDDB occurrences within 10 miles of the project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		Calotropis, Cynanchum, Gonolobus, and *Sarcostemma.* Adult butterflies typically live from two to six weeks, but overwintering individuals may live as long as nine months. Overwintering migratory adults will roost in large colonies in forested sites in California and Mexico, which must provide protection from the elements and assist with thermoregulation.		
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT-/ -/-	This beetle species is closely associated with elderberry shrubs (Sambucus sp.) for food and reproduction. This species usually occurs along rivers and streams and eggs are laid on the bark of elderberry shrubs and larvae hatch and burrow into the stems. Adults eat elderberry leaves and flowers. Stem diameter must be a minimum of one inch and exit holes in stems are the most common methods for identification. This species ranges from southern Shasta County to Fresno County.	No	The site is outside of the species' accepted distribution range and contains no elderberry. The closest CNDDB record (EONDX 34387) is from 1989 and approximately 2.26 miles north of the Project site.
Fish				
Mylopharodon conocephalus hardhead	-/- -/SSC	This is a large cyprinid that is found in small to large streams at low- to mid-elevations in relatively undisturbed habitats, as well as lakes and reservoirs. They prefer clear, deep pools and runs with sand-gravel-boulder	No.	There is no stream habitat present within the BSA. The only CNDDB record (EONDX 2311) is from 1981 and approximately

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		substrates and low velocities. The species is omnivorous, mainly gleaning food materials from bottom substrates. It is suspected that hardhead spawn on gravel substrates. The species is known to occur in the Sacramento-San Joaquin and Russian River drainages, with the distribution extending from the Kern River north to the Pit River in Modoc County. It can be found in tributary streams in the San Joaquin drainage but is absent from the valley reaches, and in the Sacramento drainage it is found in most tributaries as well as the Sacramento River.		8.0 miles northeast of the Project site.
Amphibians				
Ambystoma californiense pop. 1 California tiger salamander – Central California DPS	FT/ST -/WL	This stocky salamander spends the majority of its life aestivating in upland habitat in abandoned small mammal burrows, such as those of ground squirrels. After a sufficient winter rain event, adults emerge to breed in ephemeral pools or artificial ponds, which must remain inundated for at least 12 weeks for reproductive success. Young hatch as larvae with external gills and feed on benthic invertebrates and smaller tadpoles; adults feed on a variety of terrestrial invertebrates, small fish, and small mammals. Upland habitat typically consists of valley and foothill grasslands but can also include oak	No	No suitable breeding habitat is present within the BSA. The closest CNDDB occurrence (EONDX 108190) is from 2017 and approximately 2.2 miles southeast of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		woodlands and uncommonly riparian habitats. The species is found in the Central Valley and Central Coast at elevations up to 3,200 feet. Threatened by habitat loss, predation by larger amphibians and fish, and hybridization with other tiger salamander species.		
Spea hammondii western spadefoot	FPT/- -/SSC	This species relies on vernal pools for breeding where predators cannot become established. It occurs in open areas with sand or gravelly soils in a variety of habitats: grasslands, coastal scrub, woodlands, chaparral, sandy washes, lowland river floodplains, alkali flats, foothills, and mountains. This species is endemic to California and northern Baja California with a distribution from Redding south throughout Central Valley and foothills, throughout the South Coast mountain range into coastal southern California to Transverse mountains and Peninsular mountains. This species occurs at elevations ranging from sea level to 4,500 feet.	No	No suitable breeding habitat is present within the BSA. The closest CNDDB occurrence (EONDX 124121) is from 2023 and approximately 5.81 miles southeast of the Project site.
Reptiles				
Actinemys marmorata	FPT/- -/SSC	This species is highly aquatic and diurnally active. It is found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation	No	Suitable habitat for this species is absent from the BSA, as the banks of Herndon canal are

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
northwestern pond turtle		ditches with vegetation and rocky or muddy bottoms in a wide variety of habitats. It needs basking areas near water (logs, rocks, vegetation mats, banks). This species may enter brackish water and even seawater and it digs a nest on land near water. It ranges from north of the San Francisco Bay area south, including the Central Valley.		concrete lined or armored with rock slope protection There are no CNDDB records within 10 miles of the Project site
Anniella pulchra Northern California legless lizard	-/- -/SSC	This secretive species burrows in moist, warm, loose soils with sparse vegetation in areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Individuals can be found under leaf litter from trees and shrubs or under objects such as rocks, boards, driftwood, and logs. Soil moisture is an important characteristic of suitable habitat. Breeding occurs between early spring and July, with live young born between September and November.	No	Suitable habitat for this species is absent from the BSA. The nearest CNDDB occurrence (EONDX 107017) is from an unknown date in the 1880s and approximately 2.80 miles east of the Project site.
Arizona elegans occidentalis California glossy snake	-/- -/SSC	This subspecies of glossy snake occurs from the eastern part of the San Francisco Bay south to northwestern Baja, California. It appears to prefer microhabitats of open areas with soil loose enough for easy burrowing. It inhabits arid scrub, rocky washes, grasslands, and chaparral. This	No	Suitable habitat for this species is absent from the BSA. The nearest CNDDB occurrence (EONDX 104841) is from 1893 and approximately 2.80 miles east of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		species is nocturnal and hides under rocks, in existing burrows, or creates its own burrow during daylight hours. It is usually active from late February until November.		
Gambelia sila blunt-nosed leopard lizard	FE/SE SFP	This large lizard occurs in semiarid habitats within the southern Central Valley, Cuyama Valley, and Panoche Valley, at elevations between 100 and 2,400 feet. Preferred habitats are typically flat, sparsely vegetated grasslands with large open areas with scattered shrubs for cover, and sandy washes. The species spends most of the year underground in abandoned small mammal burrows, with adults surfacing in the spring and early summer to breed and feed. Young hatch in July and August, and both adults and young recede to refugia between August and November. Individuals feed primarily on grasshoppers and smaller lizards. The species is threatened mainly by habitat loss and fragmentation.	No	Suitable habitat for this species is absent from the BSA due to historical and current disturbance. No CNDDB occurrences are present within 10 miles of the Project site.
Phrynosoma blainvillii coast horned lizard	-/- -/SSC	This cryptic lizard prefers sandy, loose soils in grasslands, forests, woodlands, and open chaparral. Individuals are often found along sandy washes and dirt roads with scattered shrubs for cover. This species feeds almost exclusively on ants. It is found in coastal California from Baja California north to the	No	Suitable habitat for this species is absent from the BSA. The nearest CNDDB occurrence (EONDX 103150) is from 1893 and approximately 2.8 miles east of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		Bay Area, southeastern desert regions, southern Central Valley flats and foothills and the surrounding mountains on drier, warmer slopes, at elevations up to 8,000 feet. The species is threatened by habitat loss and fragmentation and the spread of invasive ant species displacing native prey.		
Birds				
Agelaius tricolor tricolored blackbird	-/ST -/SSC	This species is a year-round resident that is a colonial breeder. It occurs in freshwater, emergent wetlands with tall, dense cattails or tule, but also thickets of willow, blackberry, wild rose, and tall herbs. Breeding colonies consist of a minimum of approximately 50 pairs. This species forages for mostly insects and spiders and less often seeds and cultivated grains in pastures, grain fields, cropland, and similar habitats near breeding areas.	No	Suitable habitat for this species is absent from the BSA. The most recent CNDDB occurrence (EONDX 98806) is from 1975 and approximately 8.48 miles east of the Project site.
Athene cunicularia hypugaea western burrowing owl	-/SCE -/SSC	This species occupies a variety of open, semi-arid to arid habitats throughout Central and Southern California, including desert regions. It prefers open habitats with few shrubs or trees and low-growing vegetation. It is most active around sunrise and sunset and utilizes burrows constructed	Yes	Although no individuals or sign of the species were observed during the survey, the BSA contains open habitat, canals, and a large population of California ground squirrels. No CNDDB occurrences are present

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		by mammals year-round for shelter and nesting. This species is well documented in urban areas where patches of undeveloped areas are present (e.g., canals, airports, drainage basins), and in areas of dense agricultural development, particularly where canals provide burrow habitat. It forages primarily for rodents and insects within several miles of its burrow, usually in open grassy habitats if available. It has been observed hunting bats and insects around parking lot lights. Threats to this species include development resulting in habitat loss/fragmentation.		within 10 miles of the Project site.
Buteo swainsoni Swainson's hawk	-/ST -/-	This species occurs in grassland, desert and agricultural landscapes in the Central Valley and Antelope Valley. These hawks may be resident or migrant, and nest and breed in stands with few trees in juniper-sage flats, riparian areas, and oak savannah habitats. This species has also been observed nesting and breeding in large eucalyptus trees along freeways and in trees over rural residences surrounded by agriculture. Nests are a platform of sticks, bark, and fresh leaves at or near the top of trees. This species breeds from late March to late August. It forages in	Yes	There is suitable low quality foraging habitat throughout the BSA. California ground squirrels, a prey species, are present throughout the project site. The edge of the BSA and nearby residential areas have some mature trees that could provide nesting habitat. No individuals or sign of the species were observed during the survey. The closest CNDDB record (EONDX 91594) is from 1956 and

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		grassland, open scrub, and grain fields, primarily for rodents.		approximately 2.76 miles southeast of the Project site.
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT/SE -/-	This migratory species nests in open riparian woodlands along broad lower flood bottoms of larger river systems. It prefers willows, often mixed with cottonwood, with an understory of blackberry, nettles or wild grape. Its nest is most often placed in willows with cottonwoods used extensively for foraging and also occasionally nests in orchards adjacent to river bottoms.	No	No suitable foraging or nesting habitat is present within the BSA for this species. The closest CNDDB record (EONDX 96983) is from 1883 and approximately 7.73 miles northeast of the Project site.
Mammals				
Antrozous pallidus pallid bat	-/- -/SSC	This species occurs at low elevations throughout California in a wide variety of habitats including grasslands, shrublands, woodlands, forests, and mixed conifer. It occurs most commonly in open, dry habitats with rocky areas for roosting. It is a yearlong nocturnal resident that hibernates during winter. It forages in open areas mainly on insects and arachnids, occasionally on the ground. Day roosts occur in caves, crevices, mines, and occasionally hollow trees, buildings, and bridges and night roosts occur in more open sites. Maternity colonies form in early April with young volant by July or	No	No suitable roosting habitat is present within the BSA. The closest CNDDB record (EONDX 66606) is from 1909 and approximately 8.76 miles southeast of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		August. This bat species is very sensitive to disturbance of roosting sites.		
Dipodomys nitratoides exilis Fresno kangaroo rat	FE/SE -/-	This is a subspecies of the San Joaquin kangaroo rat (*Dipodomys nitratoides*) that occurs on bare alkaline clay-based soils typically within alkali desert scrub and open grassland. Historically, this species occurred on the valley floor in Kings, Fresno, Madera, and Merced counties, but may be extirpated within most of the historical range. This species is nocturnal that excavates burrows for temperature regulation, litter-rearing, shelter, and escape from predators typically with tunnels approximately 12 to 15 inches below ground. It eats seeds of annual forbs and grasses. It is threatened by predation and disease.	No	The BSA has been an orchard for at least 30 years and has undergone regular tilling until the trees were uprooted in 2017. It is unlikely that a source population is nearby as the closest CNDDB recorded occurrence (EONDX 23963) is from 1898 and approximately 3.30 miles southeast of the BSA.
Eumops perotis californicus western mastiff bat	-/- -/SSC	This species occurs in open, semi-arid to arid habitats throughout southeastern San Joaquin Valley and Coast Ranges from Monterey County southward. It can also occur in urban areas. It feeds on insects captured in flight and roosts in cliff faces, high buildings, trees, and tunnels. The maternity season begins in March with young typically volant by September.	No	No suitable roosting habitat is present within the BSA. The closest CNDDB record (EONDX 66373) is from 1991 and approximately 4.48 miles southeast of the Project site.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		Nursery roosts most often occur in tight rock crevices or crevices in buildings.		
Taxidea taxus American badger	-/- -/SSC	This species occurs mostly in open, drier stages of shrub, forest, and herbaceous habitats, with friable soils. It feeds mostly on fossorial rodents. It digs burrows for cover and reproduction and can dig a new den each night. Litters are typically born in March and April. This species can be somewhat tolerant of human activities but generally avoids cultivated agricultural habitats.	Yes	This species may be a transient forager through the Project site. No potential dens are present within the BSA. California ground squirrels, a prey species for badgers, and burrow complexes are present throughout the BSA. The closest CNDDB record (EONDX 56599) is from 1988 and approximately 1.92 miles northeast of the Project site.
Vulpes macrotis mutica San Joaquin kit fox	FE/ST -/-	This fox species is endemic to the Central Valley and primarily occurs in arid to semi-arid grasslands, open shrublands, savannahs, and grazed lands with loose-textured soils within the San Joaquin Valley, Carrizo Plain, Salinas Valley, Cuyama Valley, and other small valleys in western foothills. Intensively-maintained agricultural areas are typically avoided. It is highly adaptable and documented in developed urban areas. It uses burrows year-round for shelter, escape from predators, and rearing young and it will use man-made structures, such as pipes, for denning. Kit fox feed primarily on small	No	Although California ground squirrels, a prey species for kit foxes, and burrow complexes were observed within the BSA, there is only one CNDDB recorded occurrence within 10 miles of the Project site. The only record (EONDX 53873) is approximately 0.69 miles northeast of the Project site and is from 1993.

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Habitat Requirements	Potential to Occur	Rationale
		mammals, but will also consume birds, reptiles, insects, and scavenge for human food. It is threatened by habitat loss and fragmentation, vehicle strikes, and disease such as the current mange outbreak in urban population in Bakersfield and in nearby natural areas.		

CRPR (California Rare Plant Rank):

- 1A Presumed Extinct in California
- 1B Rare, Threatened, or Endangered in California and elsewhere
- 2A Plants presumed extirpated in California, but more common elsewhere
- 2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension:

- .1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- .2 Fairly endangered in California (20-80% occurrences threatened)
- .3 Not very endangered in California (<20% of occurrences threatened)

FE	Federally Endangered
FT	Federally Threatened
FPT	Federally Proposed Threatened
SE	State Endangered
ST	State Threatened
SCE	State Candidate Endangered
SSC	State Species of Special Concern
SFP	State Fully Protected
WL	Watch List

TECHNICAL MEMORANDUM

Date: September 30, 2025

Project: Cultural resources records search- **Lennar Homes Vesting Tentative Tract Map No. 6294 Project**

To: Jaymie Brauer, Principal Planner

From: Robert Parr, MS, RPA, Senior Archaeologist

Subject: Cultural Resources Records Search Results (RS#25-405)

Background

A cultural resource records search (#25-405) was conducted at the Southern San Joaquin Valley Information Center at California State University, Bakersfield for the Lennar Homes VTTM No. 6294 Project in the city of Fresno, Fresno County, California. The purpose of the search was to determine whether any known cultural resources were located on or near the proposed project that might be impacted by project development and/or activities.

Project Location

The Project subject property is approximately 30 acres (APN 505-060-07 / 5326 North Grantland Avenue) located at the southeast corner of North Grantland Avenue and West Barstow Avenue in the City of Fresno. The project is located in a portion of the northwest ¼ of the southwest ¼ of Section 9, T.13S, R.19E (MDBM) (see Attachment A).

Project Description

The Project subject property is approximately 30 acres (APN 505-060-07) located at the southeast corner of North Grantland Avenue and West Barstow Avenue in the City of Fresno. Vesting Tentative Tract Map No. 6294 (VTTM 6294) will subdivide the subject property into a 187-lot single-family residential subdivision with five (5) outlots for open space, recreation, landscaping and a pedestrian trail. The Project also includes on- and off-site improvements including external city circulation roads, interior local streets, curbs, gutters, storm drains, sidewalks, pedestrian walking trail for future connection, open space, landscaping, lighting and retaining walls, all of which will be developed to City standards by the Project developer. The Project will connect to existing City of Fresno water and sewer service systems. All residential units will be equipped with 410-watt solar panels, utilize all electric appliances and will be EV-ready (pre-wired during construction to allow for installation of EV residential charger in the future).

The subject property is zoned Residential Medium Density (5.0-12 D.U./acre) within the West Area Neighborhoods Specific Plan (WANSP) and historically has been a commercial orchard.

Construction of the residential development would start Q3 2026 and full buildout will be completed February 2029.

Results

The records search covered an area within one-half mile of the project and included a review of the *National Register of Historic Places*, *California Points of Historical Interest*, *California Registry of Historic Resources*, *California Historical Landmarks*, *California State Historic Resources Inventory*, and cultural resource reports on file.

The records search indicated that the project had never been surveyed for cultural resources, and it is not known if any exist on it.

Six cultural resource studies have been conducted within a half mile of the project (Jackson 1990; Bissonnette 1994; Brady 2008; Hibma 2010; Whitehouse and Blind 2010; Sauls 2022).

Twelve historic-era cultural resources have been recorded within one half mile of the project. These include a segment of the Herndon Canal (Primary no. P-10-005573) which runs adjacent to the northern project boundary, the Epstein Canal (P-10-005829), and ten residential and commercial buildings that date prior to 1980 (P-10-005816, P-10-006002 through -006010). No additional cultural resources have been identified within half a mile of the project.

A Sacred Lands File request was also submitted to the Native American Heritage Commission (NAHC). A response dated September 30, 2025, indicates *negative* results (see Attachment B).

Conclusions

Based on the results of cultural records search findings and the lack of significant historical or archaeological resources previously identified within a half mile radius of the proposed Project, the potential to encounter subsurface cultural resources is minimal. The potential to uncover subsurface historical or archaeological deposits would be considered unlikely.

However, there is still a possibility that historical or archaeological materials may be exposed during construction. Grading and trenching, as well as other ground-disturbing actions have the potential to damage or destroy these previously unidentified and potentially significant cultural resources within the project area, including historical or archaeological resources. Disturbance of any deposits that have the potential to provide significant cultural data would be considered a significant impact. To reduce the potential impacts of the Project on cultural resources, the following measures are recommended to be included as Conditions of Approval. With implementation of CUL-1 and CUL-2, the Project would have a less than significant impact related to cultural resources.

CUL-1: If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from Project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. Implementation of the mitigation measure below would ensure that the proposed Project would not cause a substantial adverse change in the significance of a historical resource.

CUL-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code. The specific protocol, guidelines, and channels of communication outlined by the Native American Heritage Commission, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed. Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the county coroner.

Robert E. Parr, MS, RPA
Senior Archaeologist

Attachment A- Figures
Attachment B- NAHC Response Letter

200124.03

References
(Alpha-numeric designation in parentheses following citation refers to IC report reference number)

Bissonnette, Linda Dick
1994 Grantland Avenue Sewer Trunk and Herndon Expressway Cultural Resources Assessment. Cultural Resources Consulting. (FR-00302)

Brady, Jon L.
2008 Historic Property Survey for the Horizon Enterprises Property 6785 & 6825 West Barstow Avenue in the City of Fresno, California. J&R Environmental Services (FR-02336)

Hibma, Michael
2010 Historical Resources Evaluation Report for the Veterans Boulevard/State Route 99 Interchange and Grade Separations Project, Fresno, Fresno County, California. LSA Associates, Inc. (FR-02431)

Jackson, Scott R.
1990 Environmental Impact Evaluation: An Archaeological Assessment of God's Family Church Property, Fresno County, California. Cultural Resource Facility, California State University Bakersfield. (FR-00447)

Saul, Consuelo Y.
2022 Phase I Cultural Resources Assessment for the Mander Villas Project, City of Fresno, Fresno County, California. Taylored Archaeology. (FR-03099)

Whitehouse, John and Heather Blind
2010 Historic Property Survey Report for the Veterans Boulevard/ State Route 99 Interchange and Grade Separations Project., Fresno, Fresno County, California, Caltrans District 6, EA#06-OH3600. California Department of Transportation. (FR-02454)

TECHNICAL MEMORANDUM

Attachment A -
Figures

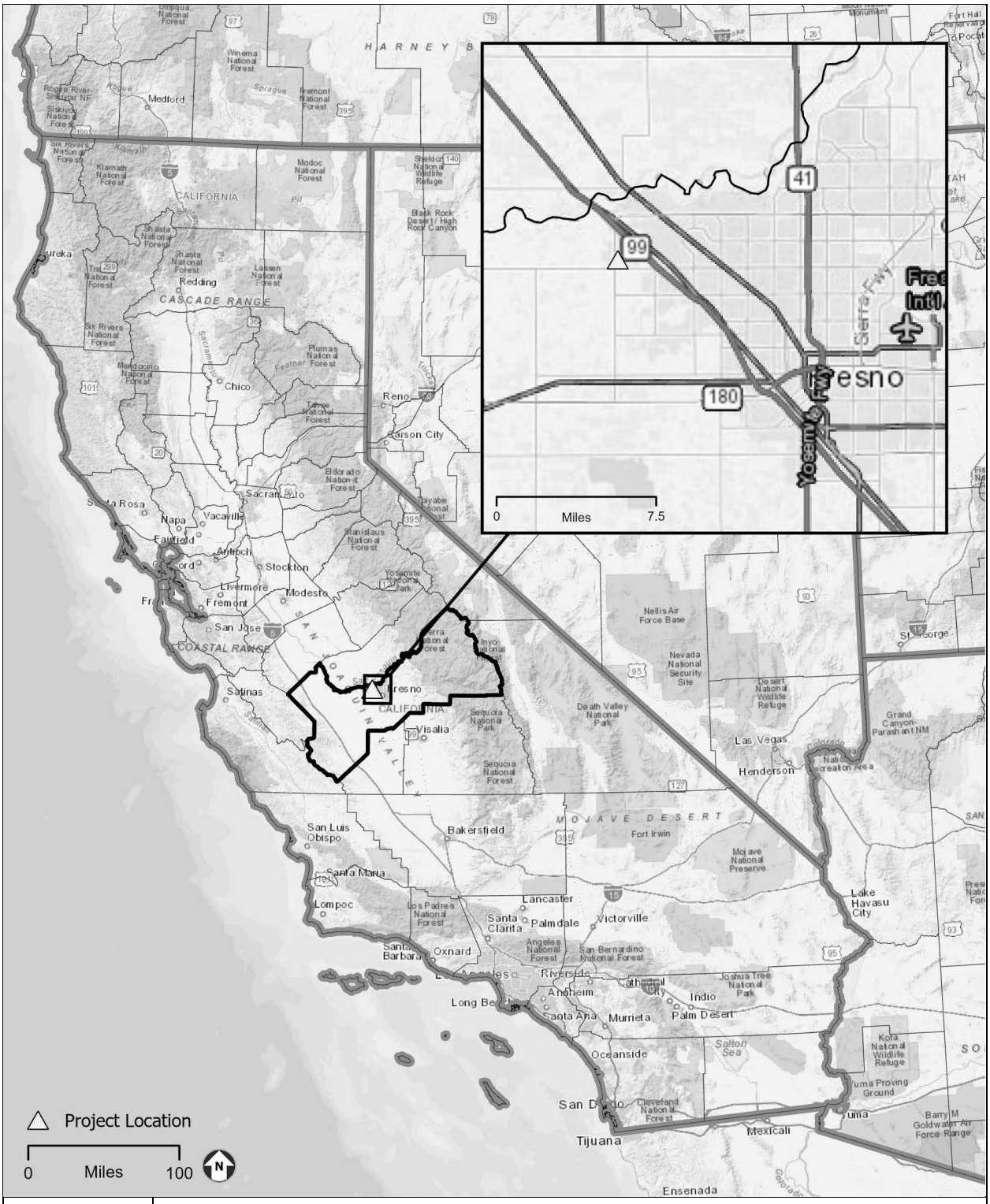


Figure 1
Regional Location



Figure 2
Project Site



Figure 3
PLSS/USGS Quad

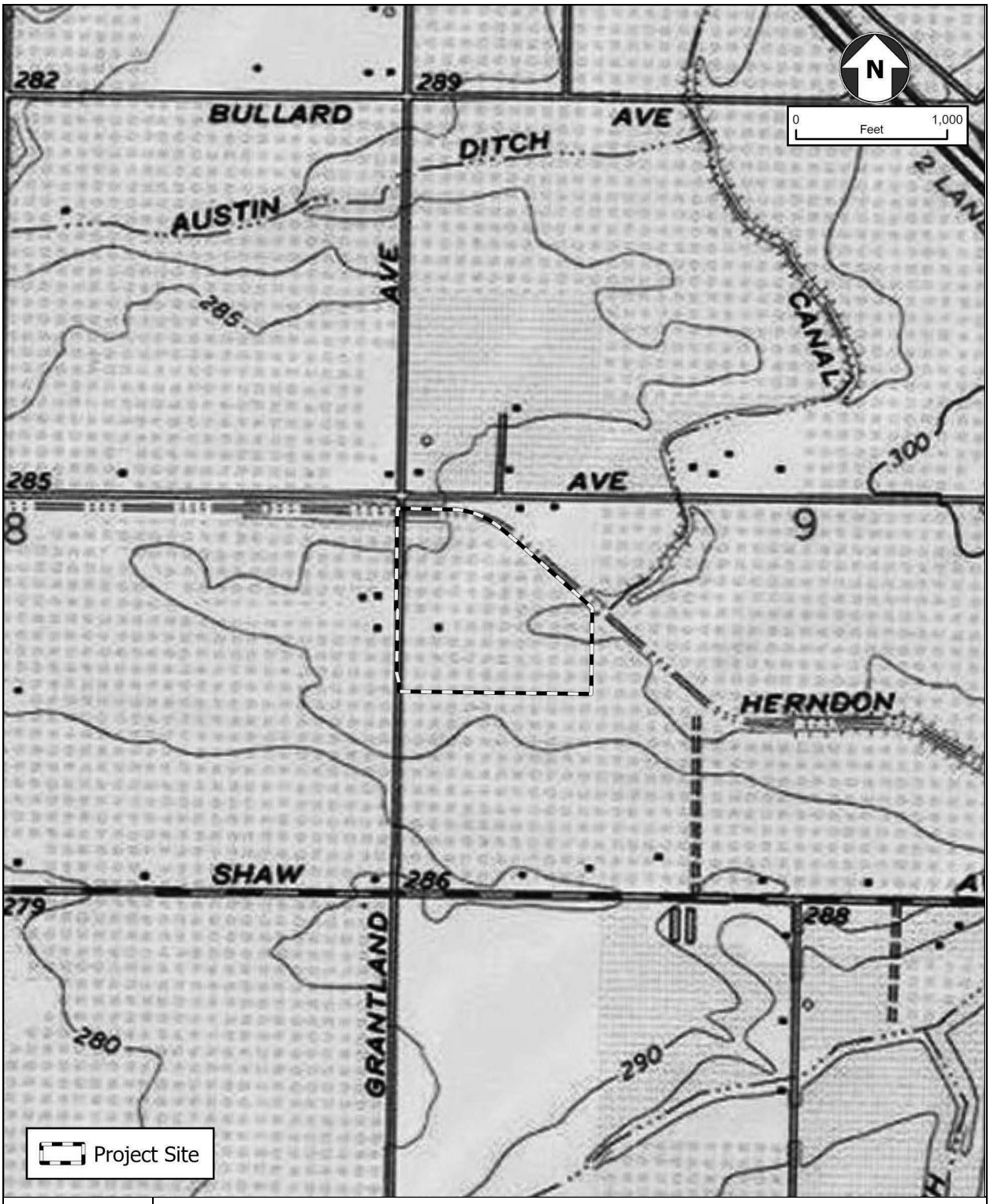


Figure 4
Topo

Attachment B -
NAHC Response Letter

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
REGINALD PAGALING
CHUMASH

VICE-CHAIRPERSON
BUFFY MCQUILLEN
YOKAYO POMO, YUKI, NOMLAKI

SECRETARY
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COMMISSIONER
BENNAE CALAC
PAUMA-YUIMA BAND OF LUISEÑO INDIANS

COMMISSIONER
VACANT

COMMISSIONER
VACANT

ACTING EXECUTIVE SECRETARY
MICHELLE CARR

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(916) 373-3710
NAHC@NAHC.CA.GOV

September 30, 2025

Bella Hedtke
QK Inc.

Submitted via Electronic
Via Email to: bella.hedtke@qkinc.com

Re: Tribal Consultation Under CEQA, Lennar Homes VTTM No. 6294 (200124.03) Project, Fresno County

To Whom It May Concern:

Pursuant to your request, attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Additionally, a search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed based on the information submitted for the above referenced project. The results were negative. Be aware that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, an SLF search is not a substitute for consultation with all tribes that are traditionally and culturally affiliated with a project's geographic area. Please contact all of the listed tribes as they may have information about sacred sites within the project area that is not listed with the NAHC.

Additionally, the NAHC recommends that agencies include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (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 that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- 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;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the 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 measures.

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 public disclosure in accordance with Government Code section 6254.10.

3. The result of the Sacred Lands File check conducted through the Native American Heritage Commission.

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

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

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

This information will aid tribes in determining whether to request formal consultation. If consultation is requested, having the information beforehand will help to facilitate the process.

If you receive notification of a change of address or phone number from a tribe, please inform the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions or require additional information, please contact me at: Pricilla.Torres-Fuentes@nahc.ca.gov.

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

Attachment

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
N. GRANTLAND AVE NEAR BARSTOW AVE
FRESNO, CALIFORNIA

PROJECT NO. 012-19206
NOVEMBER 18, 2019

Prepared for:

MS. WENDY ERICKSON
LENNAR CENTRAL VALLEY
8080 N. PALM, SUITE 110
FRESNO, CALIFORNIA 93711

Prepared by:

KRAZAN & ASSOCIATES, INC.
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Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

November 18, 2019

Project No. 012-19206

Ms. Wendy Erickson
Lennar Central Valley
8080 N. Palm Avenue, Suite 110
Fresno, California 93711

RE: Geotechnical Engineering Investigation
Proposed Residential Development
N. Grantland Avenue near Barstow Avenue
Fresno, California

Dear Ms. Erickson:

In accordance with your request, we have completed a Geotechnical Engineering Investigation for the above-referenced site. The results of our investigation are presented in the attached report.

If you have any questions or if we may be of further assistance, please do not hesitate to contact our office at (559) 348-2200.



Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

David R. Jarosz, II
Managing Engineer
RGE No. 2698/RCE No. 60185

DRJ:ht

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November 18, 2019 Project No. 012-19206

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
NORTH GRANTLAND AVENUE NEAR BARSTOW AVENUE
FRESNO, CALIFORNIA

INTRODUCTION

This report presents the results of our Geotechnical Engineering Investigation for the proposed Residential Development to be located at Grantland Avenue near Barstow Avenue in Fresno, California. Discussions regarding site conditions are presented herein, together with conclusions and recommendations pertaining to site preparation, Engineered Fill, utility trench backfill, drainage and landscaping, foundations, concrete floor slabs and exterior flatwork, retaining walls, soil cement reactivity, and pavement design.

A site plan showing the approximate boring locations is presented following the text of this report. A description of the field investigation, boring logs, and the boring log legend are presented in Appendix A. Appendix A contains a description of the laboratory-testing phase of this study; along with the laboratory test results. Appendices B and C contain guides to earthwork and pavement specifications. When conflicts in the text of the report occur with the general specifications in the appendices, the recommendations in the text of the report have precedence.

PURPOSE AND SCOPE

This investigation was conducted to evaluate the soil and groundwater conditions at the site, to make geotechnical engineering recommendations for use in design of specific construction elements, and to provide criteria for site preparation and Engineered Fill construction.

Our scope of services was outlined in our proposal dated October 29, 2019 (KA Proposal No. P696-19) and included the following:

- A site reconnaissance by a member of our engineering staff to evaluate the surface conditions at the project site.
- A field investigation consisting of drilling 9 borings to depths ranging from approximately 10 to 20 feet for evaluation of the subsurface conditions at the project site.
- Performing laboratory tests on representative soil samples obtained from the borings to evaluate the physical and index properties of the subsurface soils.

- Evaluation of the data obtained from the investigation and an engineering analysis to provide recommendations for use in the project design and preparation of construction specifications.

- Preparation of this report summarizing the results, conclusions, recommendations, and findings of our investigation.

PROPOSED CONSTRUCTION

We understand that design of the proposed development is currently underway; structural load information and other final details pertaining to the structures are unavailable. On a preliminary basis, it is understood that development will include the construction of single-family residential lots. It is anticipated the buildings will be single- or two-story wood-framed structures supported on conventional foundations utilizing concrete slab-on-grade. On-site paved areas and landscaping are also planned in the development of the project.

In the event, these structural or grading details are inconsistent with the final design criteria, the Soils Engineer should be notified so that we may update this writing as applicable.

SITE LOCATION, SITE HISTORY AND SITE DESCRIPTION

The site is irregular in shape and encompasses approximately 29.84 acres. The site is located approximately 50 feet south of Barstow Avenue, just east of Grantland Avenue in Fresno, California. Single-family residential developments are located west of the site. A canal trends along the northern and northeastern edges of the site. Several single-family residential developments, vacant land and agricultural land are located south of the site.

Site history was obtained by reviewing historical aerial photographs taken in 1998, 2007 and 2018. Review of the 1998 aerial photograph indicates that the project site was utilized as an orchard. A small residential development was located in the central-west portion of the site.

Review of the 2007 aerial photograph indicates that the project site conditions appeared to be relatively similar to that noted in the 1998 aerial photograph, with the structure removed from the central-west portion of the site.

Review of the 2018 aerial photograph indicates that the project site conditions appeared to be relatively similar to that noted in the 2007 aerial photograph.

Presently, the site predominately consists of an orchard that has been partially removed. The stumps and root systems had not yet been removed. It appears a water well is located in the western portion of the middle of the site. Buried utility lines are located along the edges of the site and may extend into the project site. The site is covered by a moderate weed growth and the surface soils have a loose consistency. The site is relatively level with no major changes in grade.

GEOLOGIC SETTING

The San Joaquin Valley, which includes the Fresno area, is a topographic and structural basin that is bounded on the east by the Sierra Nevada Mountains and on the west by the Coast Ranges. The Sierra Nevada, a fault block dipping gently southwestward, is made up of igneous and metamorphic rocks of pre-Tertiary age that comprise the basement complex beneath the Valley. The Coast Ranges contain folded and faulted sedimentary rocks of Mesozoic and Cenozoic age, which are similar to those rocks that underlie the Valley at depth and non-conformably overlie the basement complex; gently dipping to nearly horizontal sedimentary rocks of Tertiary and Quaternary age overlie the older rocks. These younger rocks are mostly of continental origin and in the Fresno area, they were derived from the Sierra Nevada.

The Coast Ranges evolved as a result of folding, faulting, and accretion of diverse geologic terrains. They are composed chiefly of sedimentary and metamorphic rocks that are sharply deformed into complex structures. They are broken by numerous faults, the San Andreas Fault being the most notable structural feature.

Both the Sierra Nevada and Coast Range are geologically young mountain ranges and possess active and potentially active fault zones. Major active faults and fault zones occur at some distance to the east, west, and south of the Fresno area. The Owens Valley Fault Zone bounds the eastern edge of the Sierra Nevada block and contains both active and potentially active faults.

Portions of the Ortigalita, Calaveras, Hayward, and Rinconada Faults, which are to the west, are considered potentially active. The San Andreas Fault is possibly the best known fault and is located about 60 to 70 miles to the west.

There are no active fault traces in the project vicinity. Accordingly, the project area is not within an Earth Quake Fault Zone (Special Studies Zone) and will not require a special site investigation by an Engineering Geologist.

Fresno residents could feel the effects of a large seismic event on one of the nearby active or potentially active fault zones. Fresno has experienced groundshaking from earthquakes in the historical past. According to the Five County Seismic Safety Element, groundshaking of VII intensity (Modified Mercali Scale) was felt in Fresno from the 1872 Owens Valley Earthquake. This is the largest known earthquake event affecting the Fresno area.

Secondary hazards from earthquakes include rupture, seiche, landslides, liquefaction, and subsidence. Since there are no known faults within the immediate area, ground rupture from surface faulting should not be a potential problem. Seiche and landslides are not hazards in the area either. Liquefaction potential (sudden loss of shear strength in a saturated, cohesionless soil) should be low since groundwater occurs below 60 feet. Lastly, deep subsidence problems may be low to moderate according to the conclusions of the Five County Seismic Safety Element. However, there are no known occurrences of structural or architectural damage due to deep subsidence in the Fresno area.

generally characterized as relatively strong, slightly compressible, and have a low permeability. Penetration resistance was generally greater than 50 blows per 6 inches. These soils had similar strength characteristics as the upper soils.

Below 4 to 5 feet, alternating layers of predominately loose to medium dense silty sand, sandy silt or sand were encountered. Some of these soils were weakly cemented in parts. Field and laboratory tests suggest that these soils had similar strength characteristics as the upper soils. Penetration resistance ranged from 5 to 39 blows per foot. Dry densities ranged from 105 to 132 pcf. These soils extended to the termination depth of our borings.

For additional information about the soils encountered, please refer to the logs of borings in Appendix A.

GROUNDWATER

Test boring locations were checked for the presence of groundwater during and immediately following the drilling operations. Free groundwater was not encountered.

Cemented silty sands, locally referred to as "hardpan," were encountered below 1 to 3 feet within several of the borings. This cementation retards the free percolation of the surface water into the soil stratum below the hardpan frequently resulting in a temporary perched water table condition at or near the ground surface.

It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, and climatic conditions, as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of our field and laboratory investigations, along with previous geotechnical experience in the project area, the following is a summary of our evaluations, conclusions, and recommendations.

Administrative Summary

In brief, the subject site and soil conditions, with the exception of the very loose surface soils, fill material, and previous development appear to be conducive to the development of the project. Approximately 2½ feet of fill was encountered in Boring No. B2 located in the southern portion of the site. The fill material predominately consisted of silty sand. The thickness and extent of fill material was determined based on limited test borings and visual observation. Thicker fill may be present at the site. Verification of the extent of fill should be determined during site grading. It is recommended that fill soil which are not properly compacted and certified be excavated and stockpiled so that the native soils can be prepared properly. These soils will be suitable for re-use as Engineered Fill, provided they

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are cleansed of excessive organics, debris, and fragments greater than 4 inches in maximum dimension. Prior to backfilling, Krazan & Associates, Inc. should inspect the bottom of the excavation to verify no additional excavation will be required.

The site was previously utilized as agricultural land. In addition, the site was previous occupied by a rural residential development. Associated with these developments are buried structures, such as utility lines, irrigation lines, water wells and possible septic systems. Any buried structures, including utilities or loosely backfilled excavations encountered during construction should be properly removed and the resulting excavations backfilled with Engineered Fill. Water wells should be abandoned in accordance with county standards. It is suspected that demolition activities of the existing structures will disturb the upper soils. After demolition activities, it is recommended that these disturbed soils be removed and/or recompacted. This compaction effort should stabilize the upper soils and locate any unsuitable or pliant areas not found during our field investigation.

The site was previously occupied by an orchard. Tree removal operations should include roots greater than 1 inch in diameter. The resulting excavations should be cleaned to firm native ground and backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Cemented silty sand, locally referred to as hardpan, was encountered below 1 to 3 feet in some of the borings. Hardpan is an excellent foundation-bearing material because of its apparent rock-like properties caused by particle cementation. However, this same cementation also retards the free percolation of the surface water into the soil stratum below the hardpan, frequently resulting in a temporary perched water table condition at or near the ground surface. This perched water condition has a substantial affect on the strength characteristics of the surface soils. As a mitigation measure, very positive drainage should be established around the proposed structures.

A canal trends along the northern and northeastern edges of the site. All deleterious materials and loose soils should be removed from the canal and the resulting excavation should be backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Sandy soil conditions were encountered at the site. These cohesionless soils have a tendency to cave in trench wall excavations. Shoring or sloping back trench sidewalls may be required within these sandy soils.

After completion of the recommended site preparation, the site should be suitable for shallow footing support. The proposed structure footings may be designed utilizing an allowable bearing pressure of 2,000 psf for dead-plus-live loads. Footings should have a minimum embedment of 12 inches.

Groundwater Influence on Structures/Construction

Based on our findings and historical records, it is not anticipated that groundwater will rise within the zone of structural influence or affect the construction of foundations and pavements for the project. However, if earthwork is performed during or soon after periods of precipitation, the subgrade soils may

become saturated, "pump," or not respond to densification techniques. Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material; or mixing the soil with an approved lime or cement product. Our firm should be consulted prior to implementing remedial measures to observe the unstable subgrade conditions and provide appropriate recommendations.

Some structures in the Fresno area that are founded on hardpan have experienced standing water for extended periods of time in crawl spaces below wooden floors or within sunken floor slab areas. The sources of the water were natural precipitation and landscape irrigation, and consequently, wood floor and sunken floor slab construction in hardpan soils are discouraged.

Site Preparation

General site clearing should include removal of vegetation; debris; existing utilities; structures including foundations; basement walls and floors; existing stockpiled soil; trees and associated root systems; rubble; rubbish; and any loose and/or saturated materials. Site stripping should extend to a minimum depth of 2 to 4 inches, or until all organics in excess of 3 percent by volume are removed. Deeper stripping may be required in localized areas. These materials will not be suitable for use as Engineered Fill. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas.

Approximately 2½ feet of fill material was encountered within Boring No. B2 located in the southern portion of the site. The fill material predominately consisted of silty sand. The thickness and extent of fill material was determined based on limited test borings and visual observation. Thicker fill may be present at the site. Verification of the extent of fill should be determined during site grading. Limited testing was performed on the fill soil during the time of our field and laboratory investigations. The limited testing indicates the fill soil had varying strength characteristics ranging from loosely placed to compacted. Therefore, it is recommended that fill soils which are not properly compacted and certified be excavated and stockpiled so that the native soils can be prepared properly. These soils will be suitable for re-use as Engineered Fill, provided they are cleansed of excessive organics, debris, and fragments greater than 4 inches in maximum dimension. Prior to backfilling, Krazan & Associates, Inc. should inspect the bottom of the excavation to verify no additional removal will be required.

The site was previously occupied by a rural residential development. Associated with this development were buried structures, such as utility lines, water wells, septic systems and irrigation lines. All buried structures or loosely backfilled excavations encountered during construction should be properly removed. The resulting excavations should be cleaned to firm native ground and backfilled with Engineered Fill, compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Excavations, depressions, or soft and pliant areas extending below planned finish subgrade level should be cleaned to firm undisturbed soil, and backfilled with Engineered Fill. In general, any septic tanks, debris pits, cesspools, or similar structures should be entirely removed. Water wells should be abandoned in accordance with county standards. Concrete footings should be removed to an equivalent depth of at least 3 feet below proposed footing elevations or as recommended by the Soils Engineer. The site should be explored with fully loaded scrapers to help identify areas of loose

unstable fills soils. Any other buried structures should be removed in accordance with the recommendations of the Soils Engineer. The resulting excavations should be backfilled with Engineered Fill.

Several trees were previously located throughout the site. Tree removal operations should include roots greater than 1 inch in diameter. The resulting excavations should be cleaned to firm native ground and backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

A canal trends along the northern and northeastern edges of the site. All deleterious materials and loose soils should be removed from the canal and the resulting excavation should be backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Following stripping, fill removal operations, tree root removal operations, and demolition activities, the exposed subgrade in building pad areas should be excavated to a depth of at least 12 inches, worked until uniform and free from large clods, moisture-conditioned as necessary, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Limits of recompaction should extend a minimum of 5 feet beyond structural elements. Prior to backfilling, the exposed subgrade should be proof-rolled and observed by Krazan & Associates, Inc. to verify stability. Soft or pliant areas should be excavated to firm native ground. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation.

Following stripping, fill removal operations, tree root removal operations, and demolition activities, the exposed subgrade in exterior flatwork and pavement areas should be excavated/scarified to a depth of at least 6 inches, worked until uniform and free from large clods, moisture-conditioned as necessary, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Limits of recompaction should extend a minimum of 2 feet beyond flatwork and pavements.

The upper soils, during wet winter months, become very moist due to the absorptive characteristics of the soil. Earthwork operations performed during winter months may encounter very moist unstable soils, which may require removal to grade a stable building foundation. Project site winterization consisting of placement of aggregate base and protecting exposed soils during the construction phase should be performed.

A representative of our firm should be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Soils Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section and the Engineered Fill section.

Engineered Fill

The upper on-site native and fill soils predominately consist of silty sand and sand. Some of these soils are weakly cemented. Preliminary testing indicates these soils will be suitable for reuse as Engineered Fill, provided they are cleansed of excessive organics, debris, and fragments larger than 4 inches in maximum dimension.

The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since he has complete control of the project site at that time.

Imported Fill material should be predominately non-expansive granular material with a plasticity index less than 10 and a UBC Expansion Index less than 15. Imported Fill should be free from rocks and clods greater than 4 inches in diameter. All Imported Fill material should be submitted to the Soils Engineer for approval at least 48 hours prior to delivery at the site.

Fill soils should be placed in lifts approximately 6 inches thick, moisture-conditioned as necessary, and compacted to achieve at least 90 percent maximum density based on ASTM Test Method D1557. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

Drainage and Landscaping

The ground surface should slope away from building pad and pavement areas toward appropriate drop inlets or other surface drainage devices. In accordance with Section 1804 of the 2016 California Building Code, it is recommended that the ground surface adjacent to foundations be sloped a minimum of 5 percent for a minimum distance of 10 feet away from structures, or to an approved alternative means of drainage conveyance. Swales used for conveyance of drainage and located within 10 feet of foundations should be sloped a minimum of 2 percent. Impervious surfaces, such as pavement and exterior concrete flatwork, within 10 feet of building foundations should be sloped a minimum of 1 percent away from the structure. Drainage gradients should be maintained to carry all surface water to collection facilities and off-site. These grades should be maintained for the life of the project.

Utility Trench Backfill

Utility trenches should be excavated according to accepted engineering practices following OSHA (Occupational Safety and Health Administration) standards by a Contractor experienced in such work. The responsibility for the safety of open trenches should be borne by the Contractor. Traffic and vibration adjacent to trench walls should be minimized; cyclic wetting and drying of excavation side slopes should be avoided. Depending upon the location and depth of some utility trenches, groundwater flow into open excavations could be experienced, especially during or shortly following periods of precipitation.

Sandy soil conditions were encountered at the site. These cohesionless soils have a tendency to cave in trench wall excavations. Shoring or sloping back trench sidewalls may be required within these sandy soils.

Utility trench backfill placed in or adjacent to buildings and exterior slabs should be compacted to at least 90 percent of maximum density based on ASTM Test Method D1557. The utility trench backfill placed in pavement areas should be compacted to at least 90 percent of maximum density based on ASTM Test Method D1557. Pipe bedding should be in accordance with pipe manufacturer's recommendations.

The Contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The Contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

Foundations

After completion of the recommended site preparation, the site should be suitable for shallow footing support. The proposed structures may be supported on a shallow foundation system bearing on undisturbed native soil or on Engineered Fill. Spread and continuous footings can be designed for the following maximum allowable soil bearing pressures:

Load	Allowable Loading
Dead Load Only	1,500 psf
Dead-Plus-Live Load	2,000 psf
Total Load, Including Wind or Seismic Loads	3,325 psf

The footings should have a minimum depth of 12 inches below pad subgrade (soil grade) or adjacent exterior grade, whichever is lower. Footings should have a minimum width of 12 inches, regardless of load.

The total movement is not expected to exceed 1 inch. Differential movement should be less than ½ inch. Most of the movement is expected to occur during construction, as the loads are applied. However, additional post-construction movement may occur if the foundation soils are flooded or saturated.

Resistance to lateral footing displacement can be computed using an allowable friction factor of 0.40 acting between the base of foundations and the supporting subgrade. Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 350 pounds per cubic foot acting against the appropriate vertical footing faces. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance. A ⅓ increase in the value above may be used for short duration, wind, or seismic loads.

Floor Slabs and Exterior Flatwork

Concrete slab-on-grade floors should be underlain by a water vapor retarder. The water vapor retarder should be installed in accordance with accepted engineering practice.

The exterior floors should be poured separately in order to act independently of the walls and foundation system. Exterior finish grades should be sloped a minimum of 2 percent away from all interior slab areas to preclude ponding of water adjacent to the structures. All fills required to bring the building pads to grade should be Engineered Fills.

Moisture within the structure may be derived from water vapors, which were transformed from the moisture within the soils. This moisture vapor can travel through the vapor membrane and penetrate the slab-on-grade. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To reduce moisture vapor intrusion, it is recommended that a vapor retarder be installed. It is recommended that the utility trenches within the structure be compacted, as specified in our report, to reduce the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the building is recommended. Positive drainage should be established away from the structure and should be maintained throughout the life of the structure. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed. In addition, ventilation of the structure (i.e. ventilation fans) is recommended to reduce the accumulation of interior moisture.

Lateral Earth Pressures and Retaining Walls

Walls retaining horizontal backfill and capable of deflecting a minimum of 0.1 percent of its height at the top may be designed using an equivalent fluid active pressure of 31 pounds per square foot per foot of depth. Walls that are incapable of this deflection or walls that are fully constrained against deflection may be designed for an equivalent fluid at-rest pressure of 52 pounds per square foot per foot per depth. Expansive soils should not be used for backfill against walls. The wedge of non-expansive backfill material should extend from the bottom of each retaining wall outward and upward at a slope of 2:1 (horizontal to vertical) or flatter. The stated lateral earth pressures do not include the effects of hydrostatic water pressures generated by infiltrating surface water that may accumulate behind the retaining walls; or loads imposed by construction equipment, foundations, or roadways. All of the above earth pressures are unfactored and are, therefore, not inclusive of factors of safety.

During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

R-Value Test Results and Pavement Design

Three subgrade soil samples were obtained from the project site for R-value testing at the locations shown on the attached site plan. The samples were tested in accordance with the State of California Materials Manual Test Designation 301. Results of the tests are as follows:

Sample	Depth	Description	R-Value at Equilibrium
1	12-24"	Silty Sand (SM)	59
2	12-24"	Silty Sand (SM)	56
3	12-24"	Silty Sand (SM)	58

The test results are moderate and indicate good subgrade support characteristics under dynamic traffic loads. The following table shows the recommended pavement sections for various traffic indices.

Traffic Index	Asphaltic Concrete	Class II Aggregate Base*	Compacted Subgrade**
4.0	2.0"	4.0"	12.0"
4.5	2.5"	4.0"	12.0"
5.0	2.5"	4.0"	12.0"
5.5	3.0"	4.0"	12.0"
6.0	3.0"	4.0"	12.0"
6.5	3.5"	4.0"	12.0"
7.0	4.0"	4.0"	12.0"
7.5	4.0"	4.0"	12.0"

**** 95% compaction based on ASTM Test Method D1557 or CAL 216***
***** 90% compaction based on ASTM Test Method D1557 or CAL 216***

If traffic indices are not available, an estimated (typical value) index of 4.5 may be used for light automobile traffic, and an index of 7.0 may be used for light truck traffic.

The following recommendations are for light-duty and heavy-duty Portland Cement Concrete Pavement Sections based on the design procedures developed by the Portland Cement Association.

PORTLAND CEMENT PAVEMENT
LIGHT DUTY

Traffic Index	Portland Cement Concrete***	Class II Aggregate Base*	Compacted Subgrade**
4.5	5.0"	--	12.0"

HEAVY DUTY

Traffic Index	Portland Cement Concrete***	Class II Aggregate Base*	Compacted Subgrade**
7.0	6.5"	--	12.0"

**** 95% compaction based on ASTM Test Method D1557 or CAL 216***
***** 90% compaction based on ASTM Test Method D1557 or CAL 216***
******Minimum compressive strength of 3000 psi***

It is recommended that any uncertified fill material encountered within pavement areas be removed and/or recompacted. The fill materials should be moisture-conditioned to near optimum moisture and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. As an alternative, the Owner may elect not to recompact the existing fill within paved areas. However, the Owner should be aware that the paved areas may settle which may require annual maintenance. At a minimum, it is recommended that the upper 12 inches of subgrade soil be moisture-conditioned as necessary and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Seismic Parameters – 2016 California Building Code

The Site Class per Section 1613 of the 2016 California Building Code (2016 CBC) and Table 20.3-1 of ASCE 7-10 is based upon the site soil conditions. It is our opinion that a Site Class D is most consistent with the subject site soil conditions. For seismic design of the structures based on the seismic provisions of the 2016 CBC, we recommend the following parameters:

Seismic Item	Value	CBC Reference
Site Class	D	Section 1613.3.2
Site Coefficient F_a	1.255	Table 1613.3.3 (1)
S_s	0.681	Section 1613.3.1
S_{MS}	0.855	Section 1613.3.3
S_{DS}	0.570	Section 1613.3.4
Site Coefficient F_v	1.863	Table 1613.3.3 (2)
S_1	0.269	Section 1613.3.1
S_{M1}	0.500	Section 1613.3.3
S_{D1}	0.334	Section 1613.3.4

Soil Cement Reactivity

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete (or stucco) and the soil. HUD/FHA and UBC have developed criteria for evaluation of sulfate levels and how they relate to cement reactivity with soil and/or water.

Soil samples were obtained from the site and tested in accordance with State of California Materials Manual Test Designation 417. The sulfate concentrations detected from these soil samples were less than 150 ppm and are below the maximum allowable values established by HUD/FHA and UBC. Therefore, no special design requirements are necessary to compensate for sulfate reactivity with the cement.

Compacted Material Acceptance

Compaction specifications are not the only criteria for acceptance of the site grading or other such activities. However, the compaction test is the most universally recognized test method for assessing the performance of the Grading Contractor. The numerical test results from the compaction test cannot be used to predict the engineering performance of the compacted material. Therefore, the acceptance of compacted materials will also be dependent on the stability of that material. The Soils Engineer has the option of rejecting any compacted material regardless of the degree of compaction if that material is considered to be unstable or if future instability is suspected. A specific example of rejection of fill material passing the required percent compaction is a fill which has been compacted with an in situ moisture content significantly less than optimum moisture. This type of dry fill (brittle fill) is susceptible to future settlement if it becomes saturated or flooded.

Testing and Inspection

A representative of Krazan & Associates, Inc. should be present at the site during the earthwork activities to confirm that actual subsurface conditions are consistent with the exploratory fieldwork. This activity is an integral part of our service, as acceptance of earthwork construction is dependent upon compaction testing and stability of the material. This representative can also verify that the intent of these recommendations is incorporated into the project design and construction. Krazan & Associates, Inc. will not be responsible for grades or staking, since this is the responsibility of the Prime Contractor.

LIMITATIONS

Soils Engineering is one of the newest divisions of Civil Engineering. This branch of Civil Engineering is constantly improving as new technologies and understanding of earth sciences advance. Although your site was analyzed using the most appropriate and most current techniques and methods, undoubtedly there will be substantial future improvements in this branch of engineering. In addition to advancements in the field of Soils Engineering, physical changes in the site, either due to excavation or fill placement, new agency regulations, or possible changes in the proposed structure after the soils report is completed may require the soils report to be professionally reviewed. In light of this, the Owner should be aware that there is a practical limit to the usefulness of this report without critical review. Although the time limit for this review is strictly arbitrary, it is suggested that 2 years be considered a reasonable time for the usefulness of this report.

Foundation and earthwork construction is characterized by the presence of a calculated risk that soil and groundwater conditions have been fully revealed by the original foundation investigation. This risk is derived from the practical necessity of basing interpretations and design conclusions on limited sampling of the earth. The recommendations made in this report are based on the assumption that soil conditions do not vary significantly from those disclosed during our field investigation. If any variations or undesirable conditions are encountered during construction, the Soils Engineer should be notified so that supplemental recommendations may be made.

The conclusions of this report are based on the information provided regarding the proposed construction. If the proposed construction is relocated or redesigned, the conclusions in this report may not be valid. The Soils Engineer should be notified of any changes so the recommendations may be reviewed and re-evaluated.

This report is a Geotechnical Engineering Investigation with the purpose of evaluating the soil conditions in terms of foundation design. The scope of our services did not include any Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring log regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices and a degree of conservatism deemed proper for this project. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

If you have any questions or if we may be of further assistance, please do not hesitate to contact our office at (559) 348-2200.

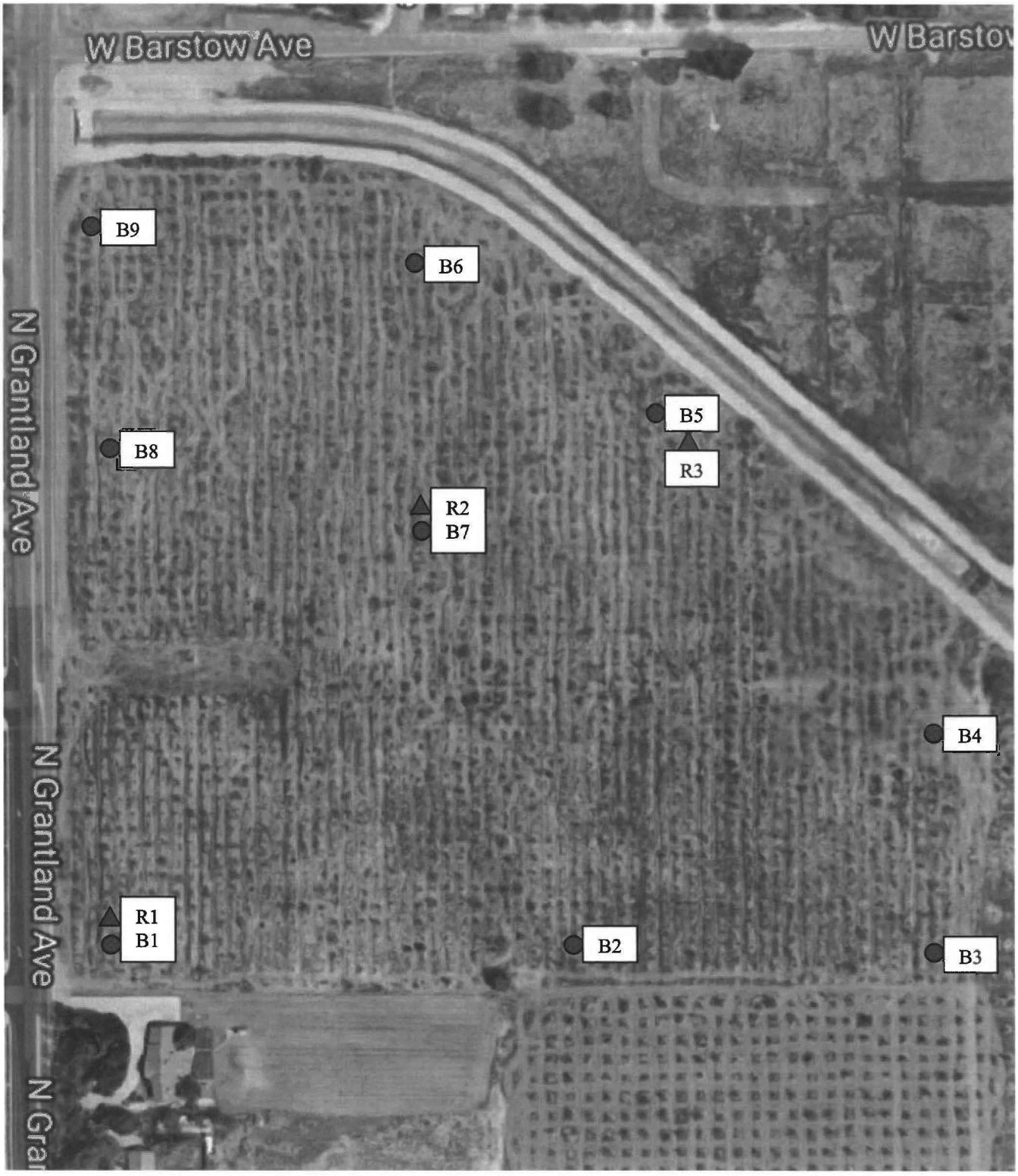
Respectfully submitted,
KRAZAN & ASSOCIATES, INC.



Steve Nelson
Project Engineer

David R. Jarosz, II
Managing Engineer
RGE No. 2698/RCE No. 60185

SN/DRJ:ht



● APPROXIMATE BORING LOCATION

▲ APPROXIMATE R-VALUE LOCATION

SITE MAP	Scale: NTS	Date: Nov. 2019	Krazan GEOTECHNICAL ENGINEERING
Residential Development Grantland Ave near Barstow Ave Fresno, California	Drawn by: HT	Approved by: DJ	
	Project No. 012-19206	Figure No. 1	

APPENDIX A

FIELD AND LABORATORY INVESTIGATIONS

Field Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploratory program. Nine 4½-inch exploratory borings were advanced. The boring locations are shown on the site plan.

The soils encountered were logged in the field during the exploration and, with supplementary laboratory test data, are described in accordance with the Unified Soil Classification System.

Modified standard penetration tests were performed at selected depths. This test represents the resistance to driving a 2½-inch diameter core barrel sampler. The driving energy was provided by a hammer weighing 140 pounds falling 30 inches. Relatively undisturbed soil samples were obtained while performing this test. Bag samples of the disturbed soil were obtained from the auger cuttings. All samples were returned to our Clovis laboratory for evaluation.

Laboratory Investigation

The laboratory investigation was programmed to determine the physical and mechanical properties of the foundation soil underlying the site. Test results were used as criteria for determining the engineering suitability of the surface and subsurface materials encountered.

In-situ moisture content, dry density, consolidation, direct shear, and sieve analysis tests were completed for the undisturbed samples representative of the subsurface material. R-value tests were completed for select bag samples obtained from the auger cuttings. These tests, supplemented by visual observation, comprised the basis for our evaluation of the site material.

The logs of the exploratory borings and laboratory determinations are presented in this Appendix.

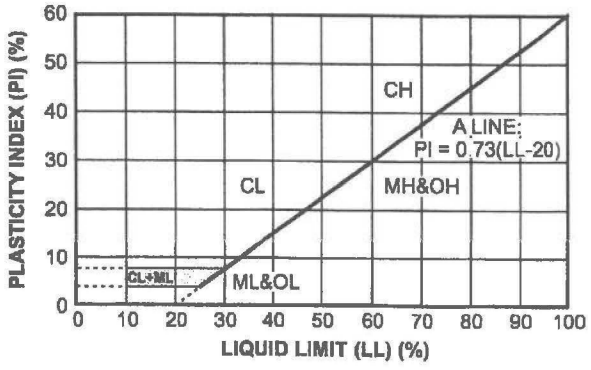
UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART			
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)		
		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)		
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)		
		SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)		
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

CONSISTENCY CLASSIFICATION	
Description	**Blows per Foot**
Granular Soils	
Very Loose	< 5
Loose	5 – 15
Medium Dense	16 – 40
Dense	41 – 65
Very Dense	> 65
Cohesive Soils	
Very Soft	< 3
Soft	3 – 5
Firm	6 – 10
Stiff	11 – 20
Very Stiff	21 – 40
Hard	> 40

GRAIN SIZE CLASSIFICATION		
Grain Type	*Standard Sieve Size*	*Grain Size in Millimeters*
Boulders	Above 12 inches	Above 305
Cobbles	12 to 13 inches	305 to 76.2
Gravel	3 inches to No. 4	76.2 to 4.76
Coarse-grained	3 to ¾ inches	76.2 to 19.1
Fine-grained	¾ inches to No. 4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
Coarse-grained	No. 4 to No. 10	4.76 to 2.00
Medium-grained	No. 10 to No. 40	2.00 to 0.042
Fine-grained	No. 40 to No. 200	0.042 to 0.074
Silt and Clay	Below No. 200	Below 0.074

PLASTICITY CHART



Log of Boring B1

Project: Residential Development

Project No: 012-19206

Client: Lennar Homes of California, Inc.

Figure No.: A-1

Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
0		***SILTY SAND (SM)*** FILL, fine- to medium-grained; light brown, damp, drills easily				
2		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained; light brown, damp, drills firmly	110.8	3.3		39
4						
6		***SILTY SAND (SM)*** Dense, fine- to medium-grained, weakly cemented; brown/light brown, damp, drills firmly	131.6	5.1		47
8						
10		***SILTY SAND/SAND (SM/SP)*** Medium dense, fine- to coarse-grained with trace GRAVEL; tan, damp, drills easily	112.0	5.9		22
12						
14		***SAND (SP)*** Medium dense, fine- to medium-grained; tan, damp, drills easily	105.3	3.0		23
16						
18						
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight

Drill Rig: CME 45B

Driller: Brent Snyder

Krazan and Associates

Drill Date: 11-3-19

Hole Size: 4½ Inches

Elevation: 20 Feet

Sheet: 1 of 1

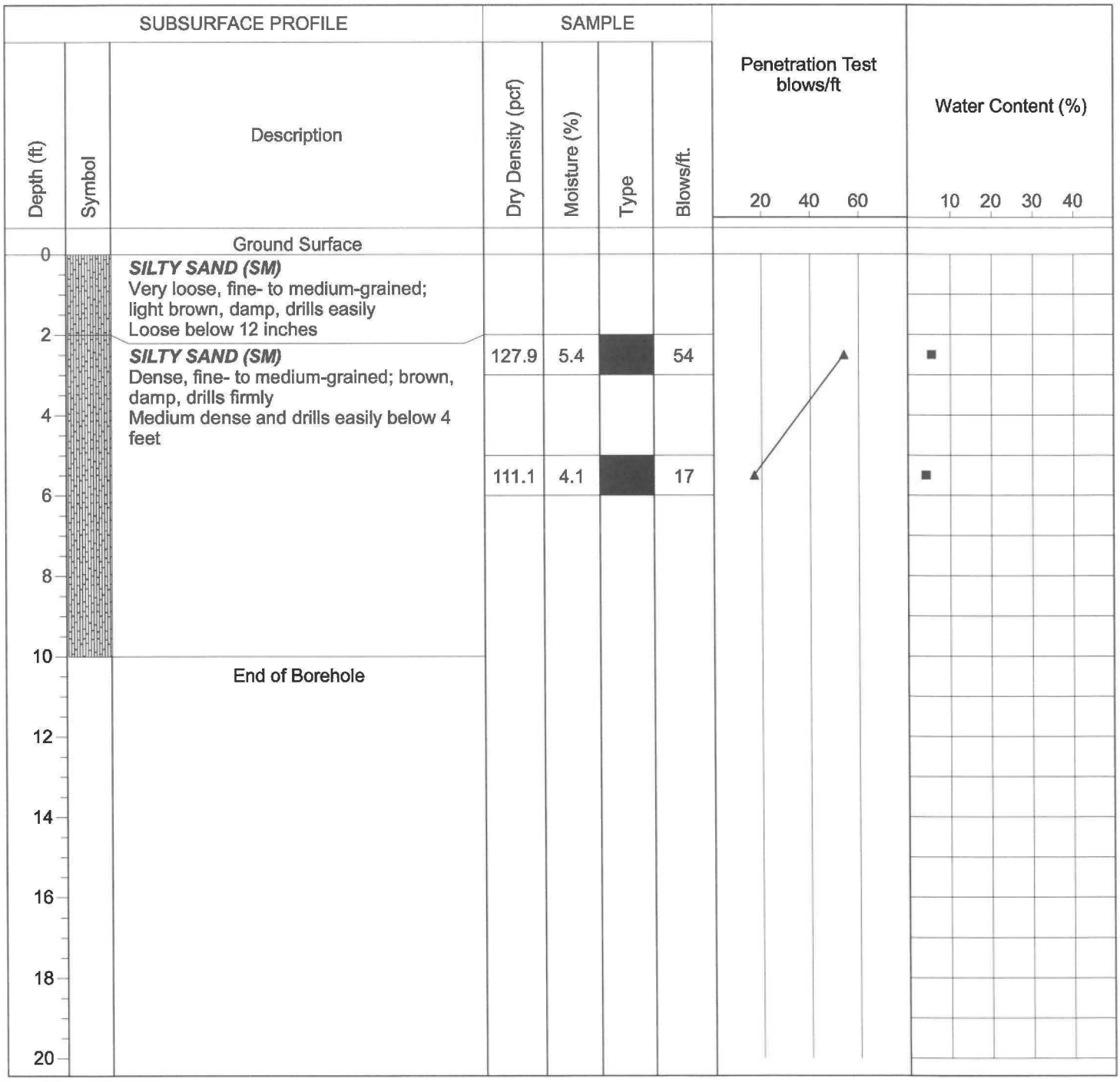
Log of Boring B2

Project: Residential Development | **Project No:** 012-19206

Client: Lennar Homes of California, Inc. | **Figure No.:** A-2

Location: Grantland Avenue near Barstow Avenue, Fresno, California | **Logged By:** R. Alexander

Depth to Water> | **Initial:** None | **At Completion:** None



Drill Method: Solid Flight | **Drill Date:** 11-3-19

Drill Rig: CME 45B | **Hole Size:** 4½ Inches

Driller: Brent Snyder | **Elevation:** 10 Feet

Krazan and Associates

Log of Boring B3

Project: Residential Development

Project No: 012-19206

Client: Lennar Homes of California, Inc.

Figure No.: A-3

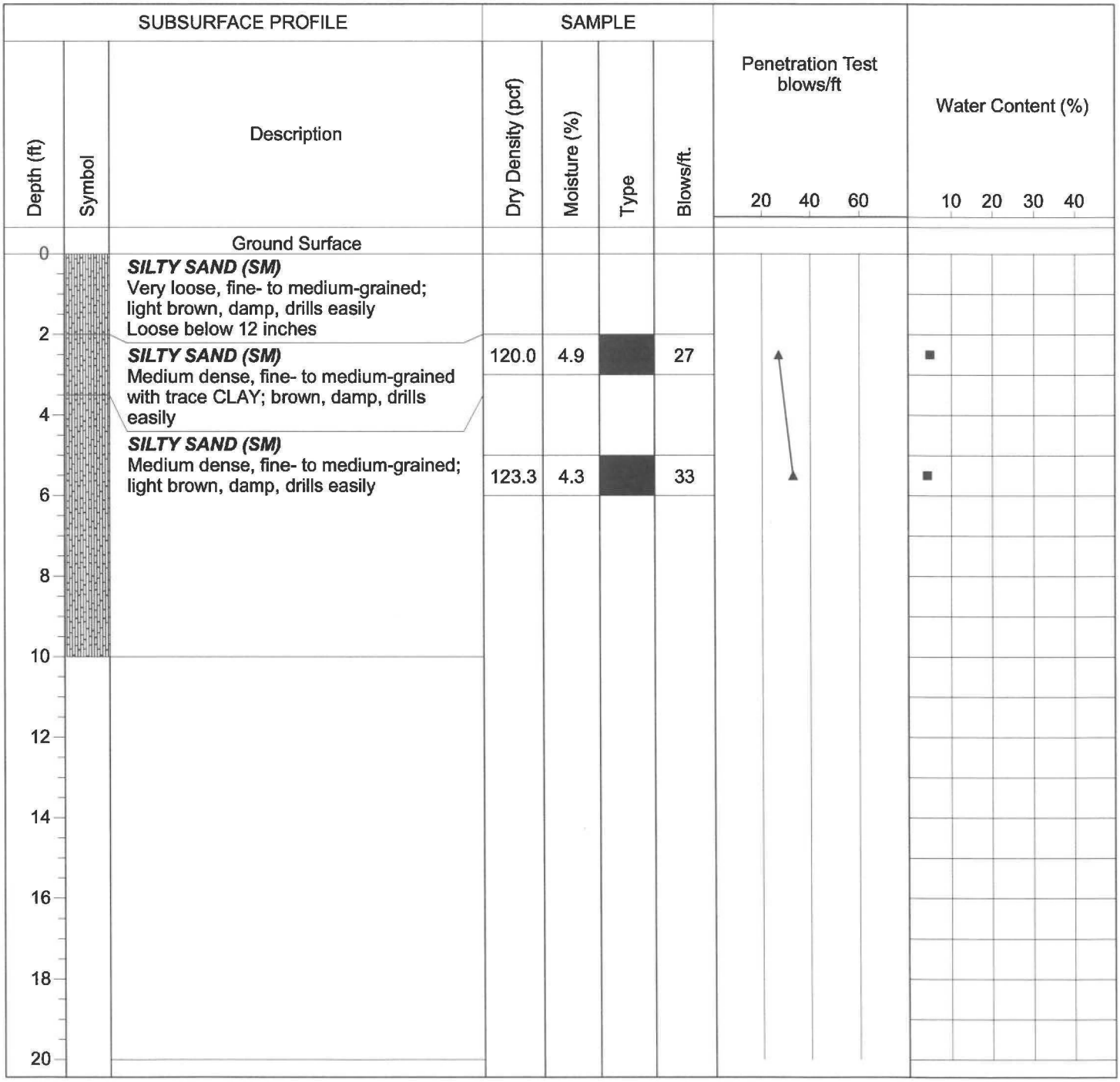
Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water>

Initial: None

At Completion: None



Drill Method: Solid Flight

Drill Date: 11-3-19

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

Elevation: 10 Feet

Sheet: 1 of 1

Log of Boring B4

Project: Residential Development

Project No: 012-19206

Client: Lennar Homes of California, Inc.

Figure No.: A-4

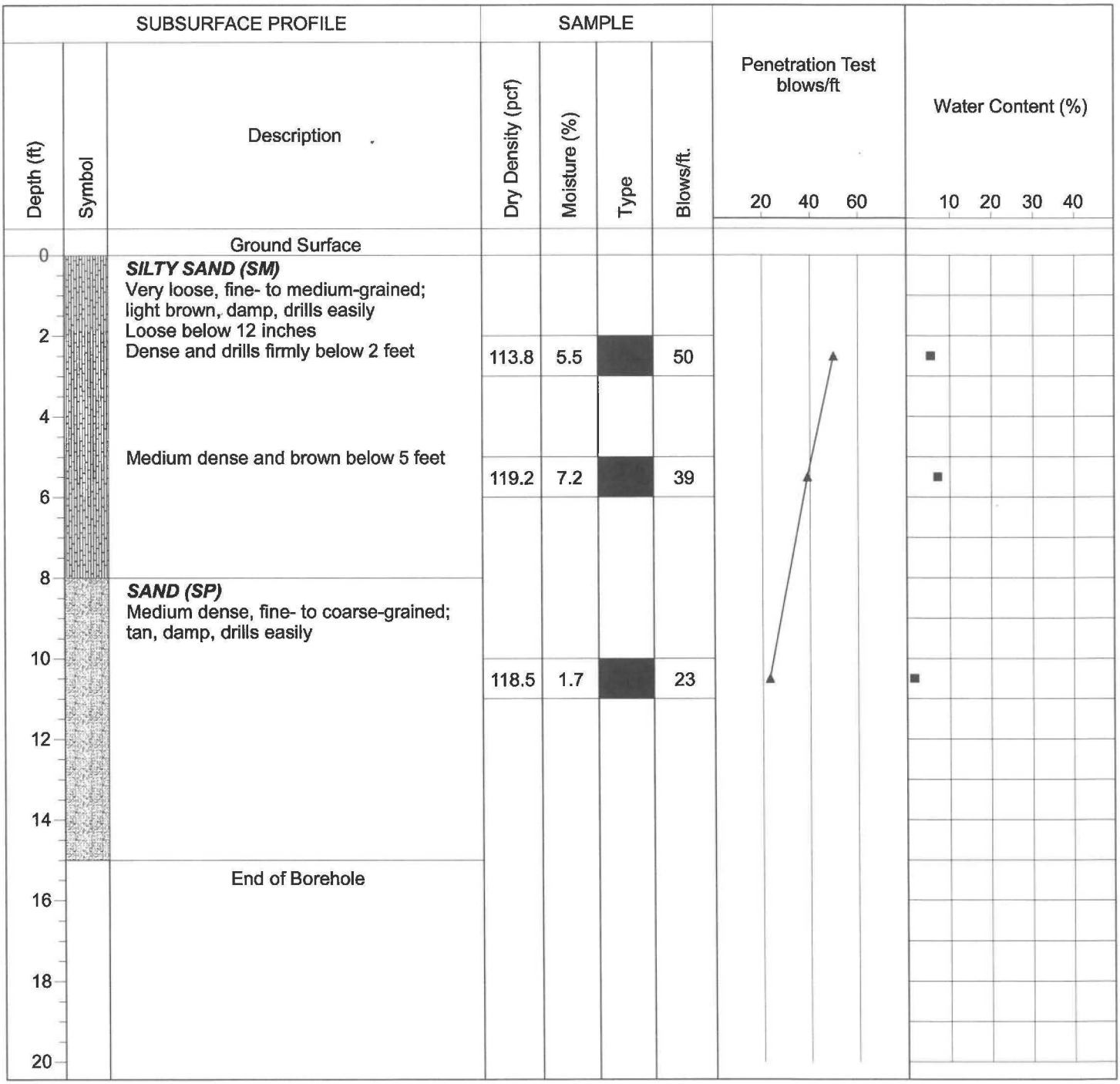
Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water>

Initial: None

At Completion: None



Drill Method: Solid Flight

Drill Date: 11-3-19

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B5

Project: Residential Development

Project No: 012-19206

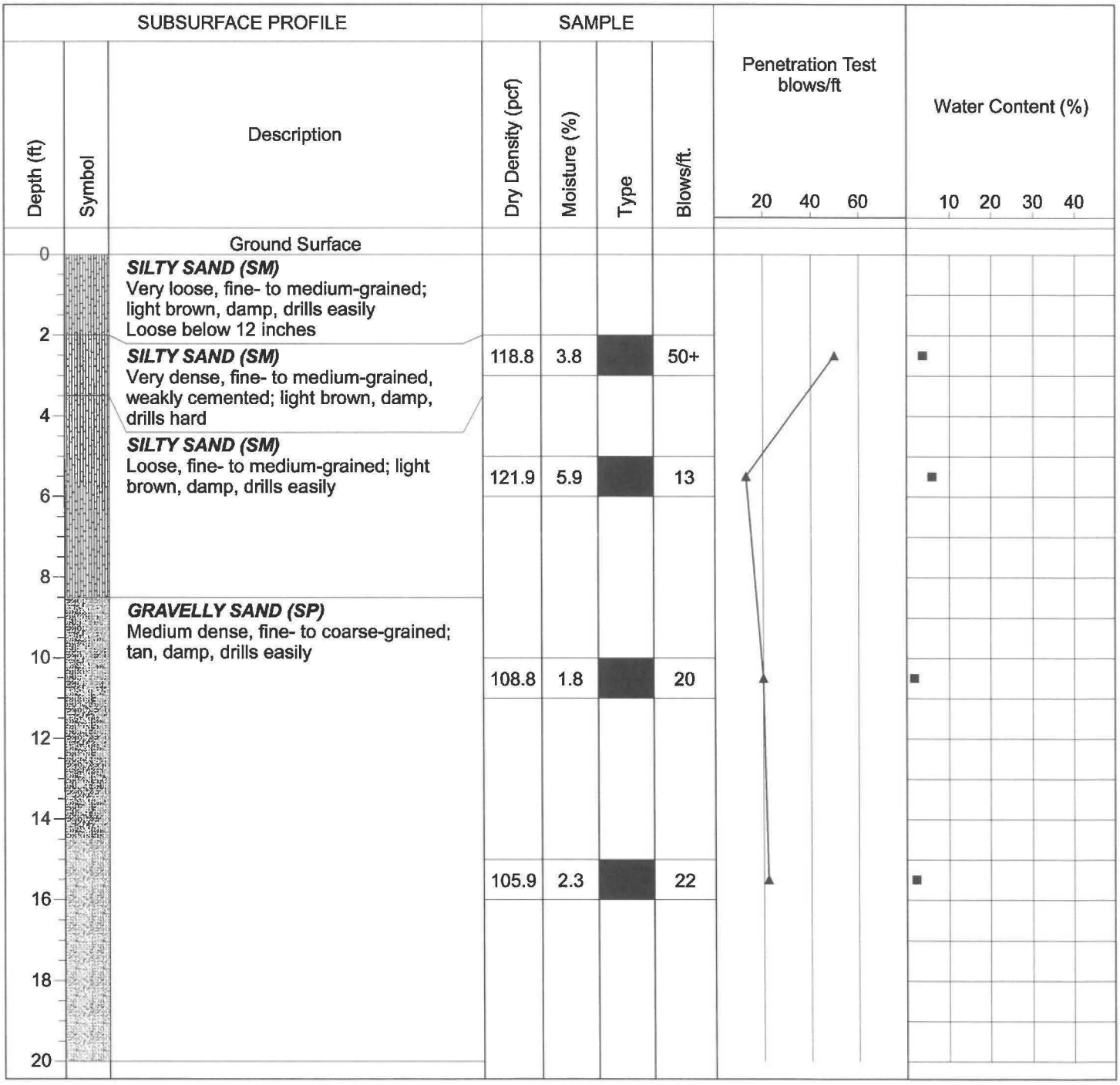
Client: Lennar Homes of California, Inc.

Figure No.: A-5

Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Solid Flight

Drill Rig: CME 45B

Driller: Brent Snyder

Krazan and Associates

Drill Date: 11-3-19

Hole Size: 4½ Inches

Elevation: 20 Feet

Log of Boring B6

Project: Residential Development

Project No: 012-19206

Client: Lennar Homes of California, Inc.

Figure No.: A-6

Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water> **Initial:** None **At Completion:** None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
0		***SILTY SAND (SM)*** Very loose, fine- to medium-grained; light brown, damp, drills easily Loose below 12 inches				
2		Brown and moist below 2½ feet	128.6	4.9		14
6			123.1	7.2		5
10			122.3	7.3		8
14		***SAND (SP)*** Loose, fine- to coarse-grained; tan, damp, drills easily	106.8	4.1		12
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Solid Flight

Drill Date: 11-3-19

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B7

Project: Residential Development

Project No: 012-19206

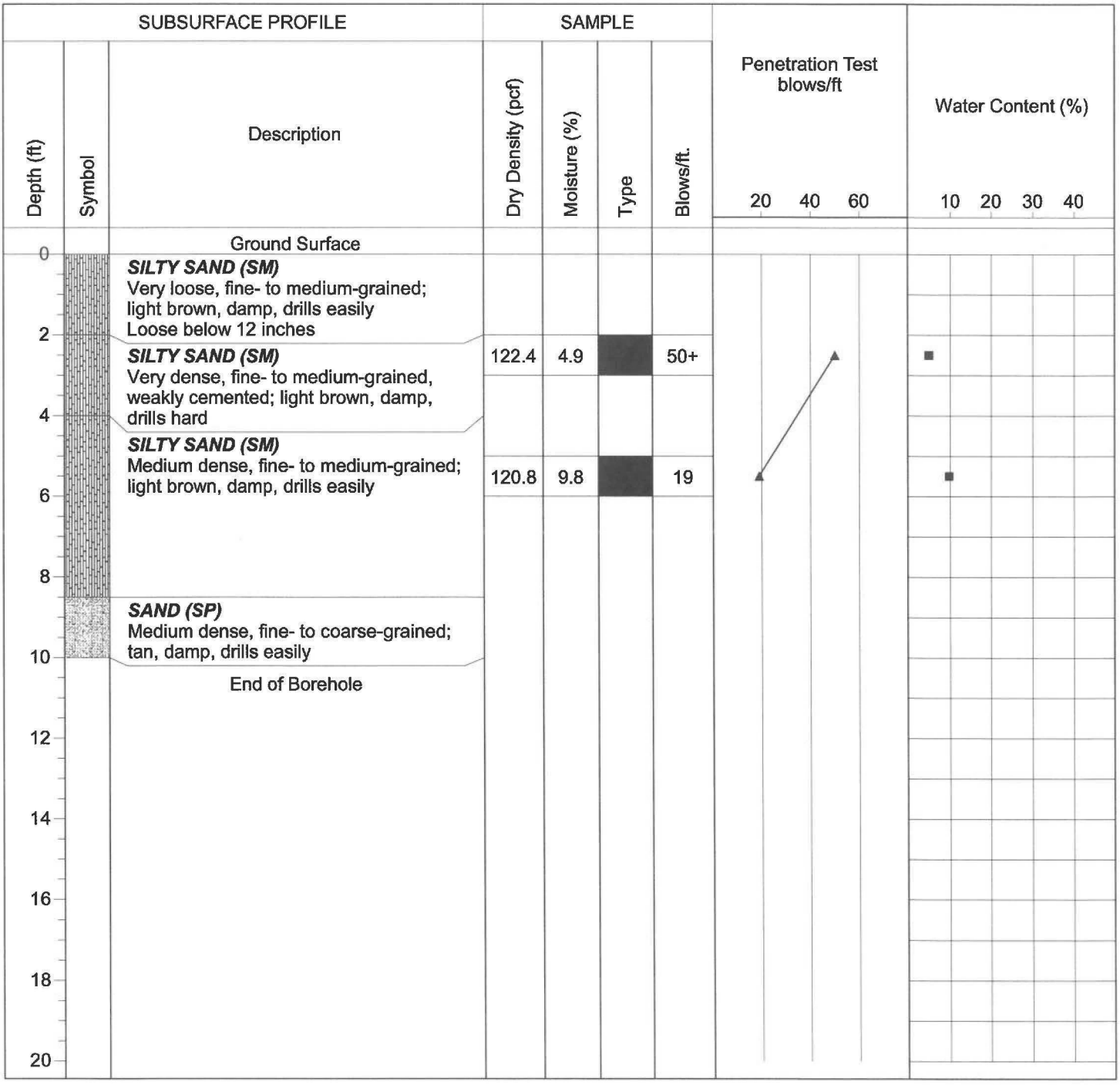
Client: Lennar Homes of California, Inc.

Figure No.: A-7

Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Solid Flight

Drill Rig: CME 45B

Driller: Brent Snyder

Krazan and Associates

Drill Date: 11-4-19

Hole Size: 4½ Inches

Elevation: 10 Feet

Log of Boring B8

Project: Residential Development

Project No: 012-19206

Client: Lennar Homes of California, Inc.

Figure No.: A-8

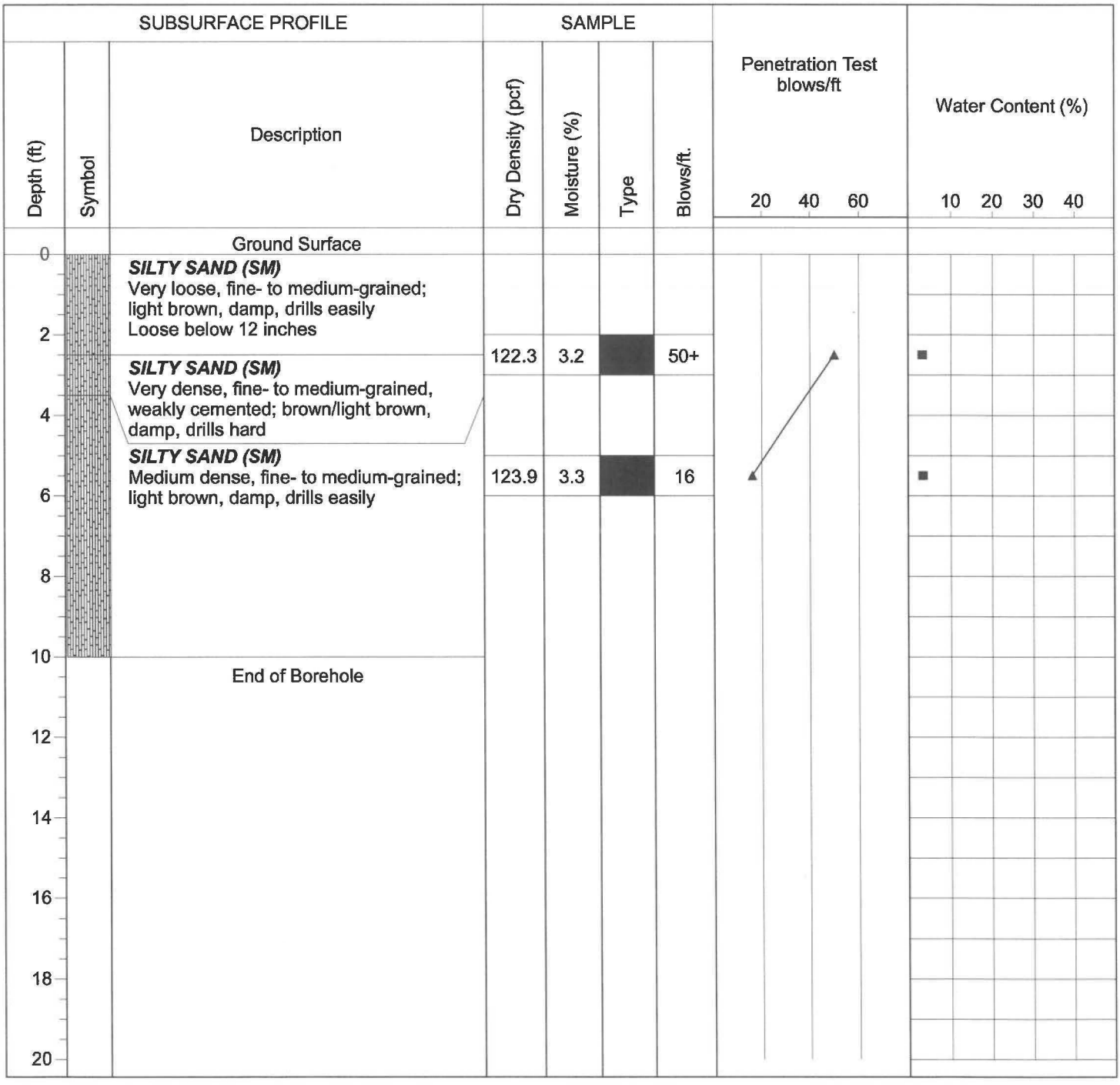
Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water>

Initial: None

At Completion: None



Drill Method: Solid Flight

Drill Date: 11-4-19

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

Elevation: 10 Feet

Log of Boring B9

Project: Residential Development

Project No: 012-19206

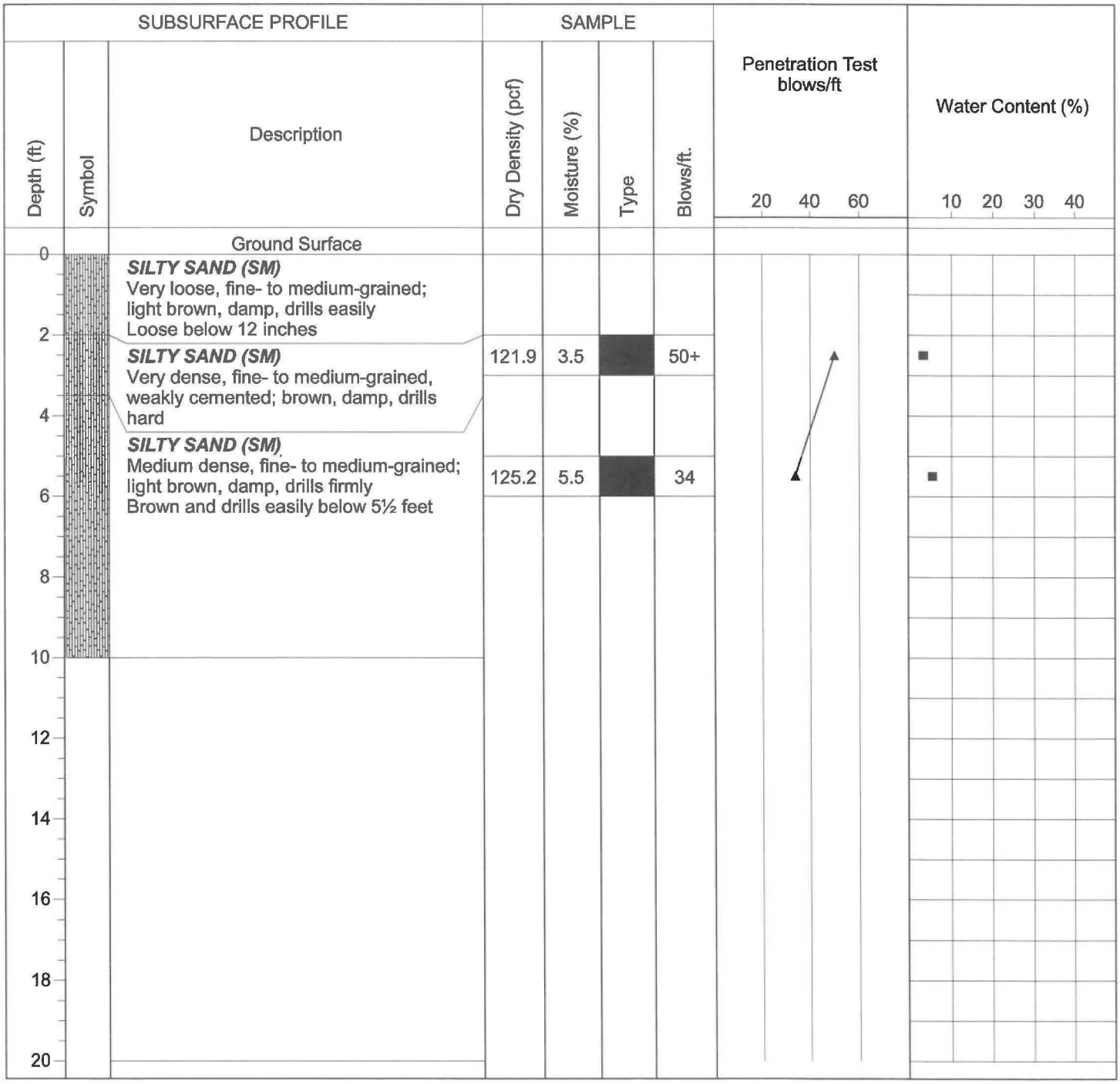
Client: Lennar Homes of California, Inc.

Figure No.: A-9

Location: Grantland Avenue near Barstow Avenue, Fresno, California

Logged By: R. Alexander

Depth to Water> **Initial:** None **At Completion:** None



Drill Method: Solid Flight

Drill Rig: CME 45B

Driller: Brent Snyder

Krazan and Associates

Drill Date: 11-4-19

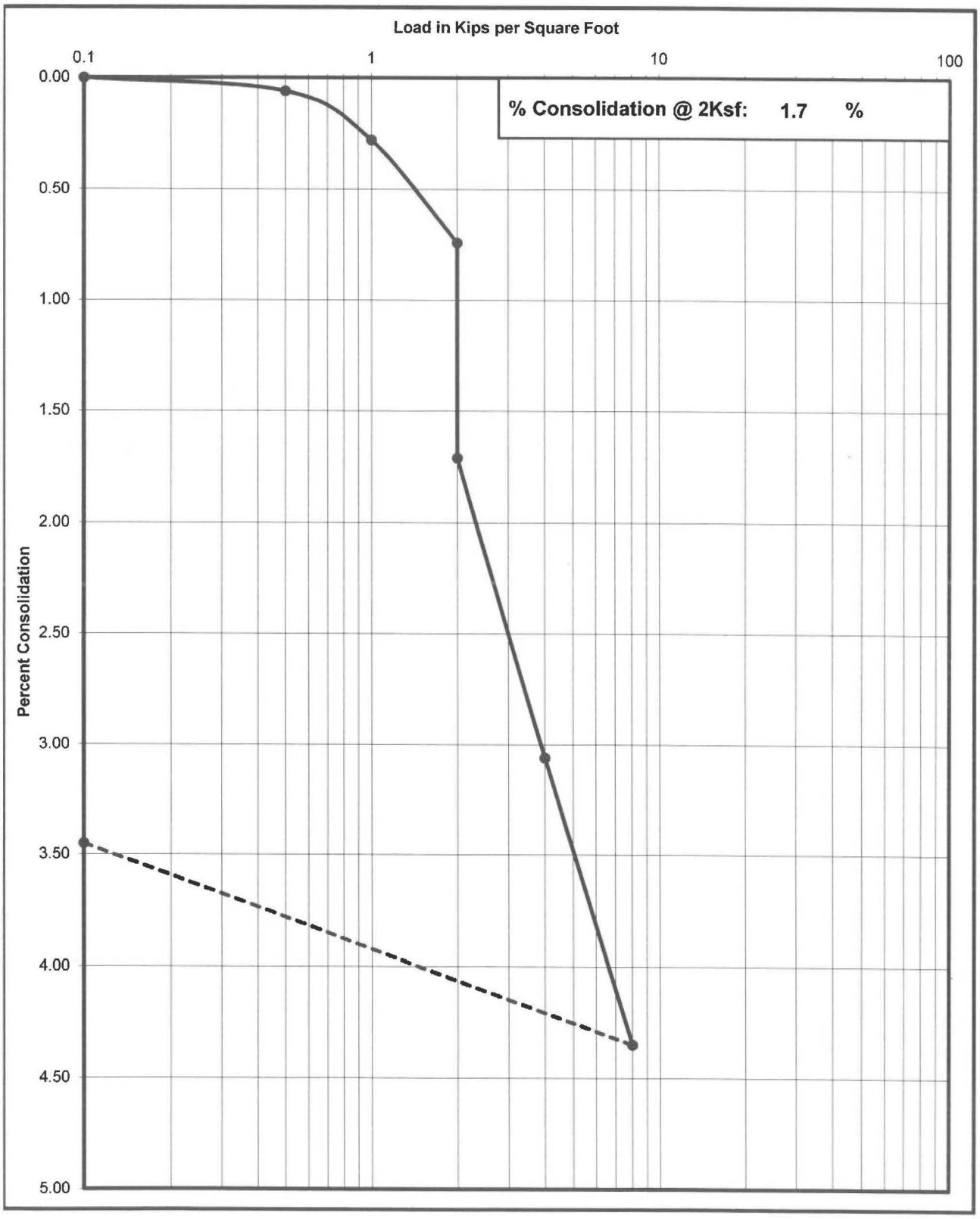
Hole Size: 4½ Inches

Elevation: 10 Feet

Sheet: 1 of 1

Consolidation Test

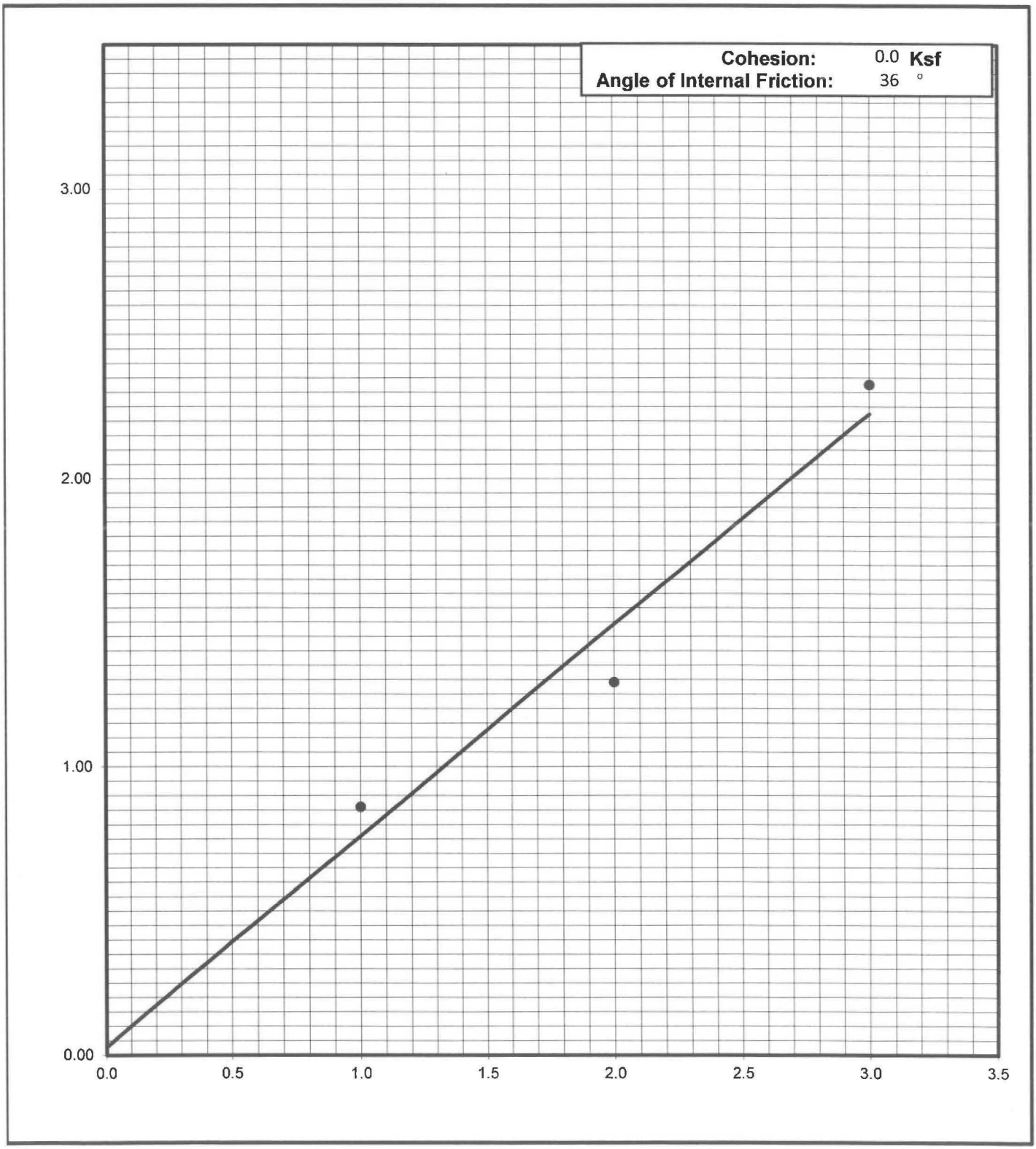
Project No	Boring No. & Depth	Date	Soil Classification
012-19206	B6 @ 2-3'	11/15/2019	SM



Krazan Testing Laboratory

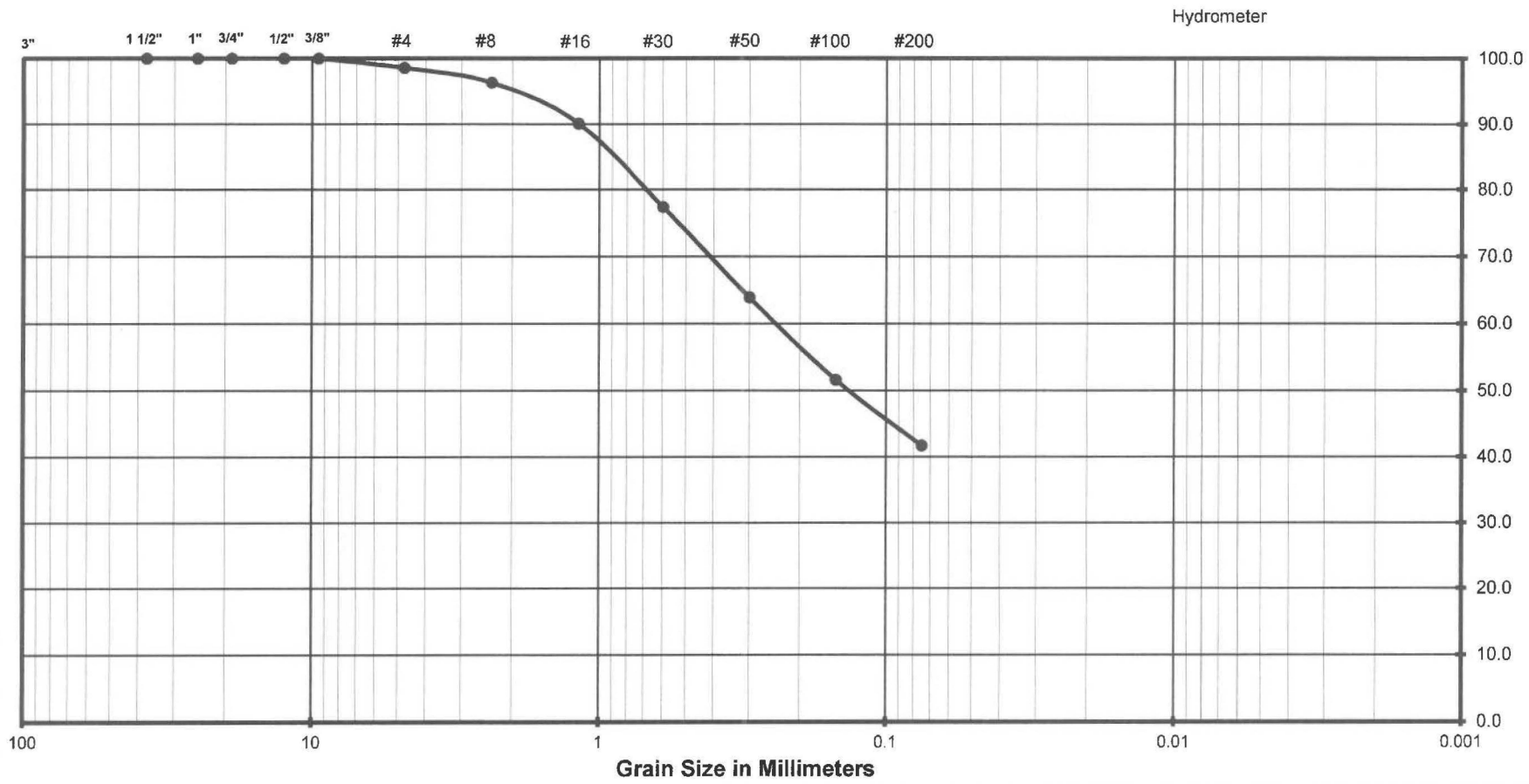
Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
012-19206	B3 @ 2-3'	SM	11/15/2019



Krazan Testing Laboratory

Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	Residential Development
Project Number	012-19206
Soil Classification	SM
Sample Number	B6 @ 2-3'

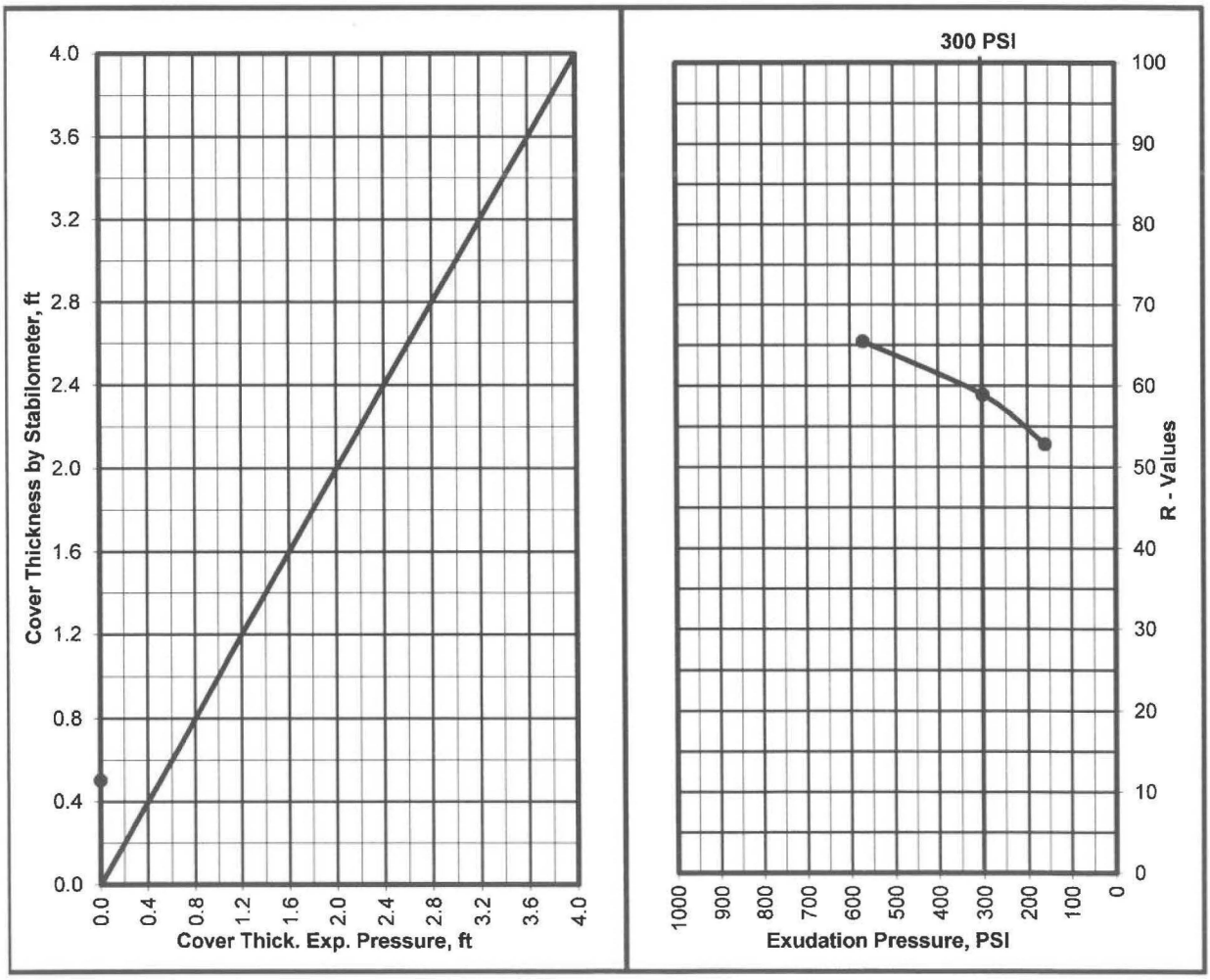
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	012-19206
Project Name	:	Residential Development
Date	:	11/12/2019
Sample Location/Curve Number	:	RV#1
Soil Classification	:	SM

TEST	A	B	C
Percent Moisture @ Compaction, %	8.6	7.6	8.1
Dry Density, lbm/cu.ft.	129.8	129.0	128.9
Exudation Pressure, psi	160	570	300
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	53	65	59

R Value at 300 PSI Exudation Pressure	**59**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



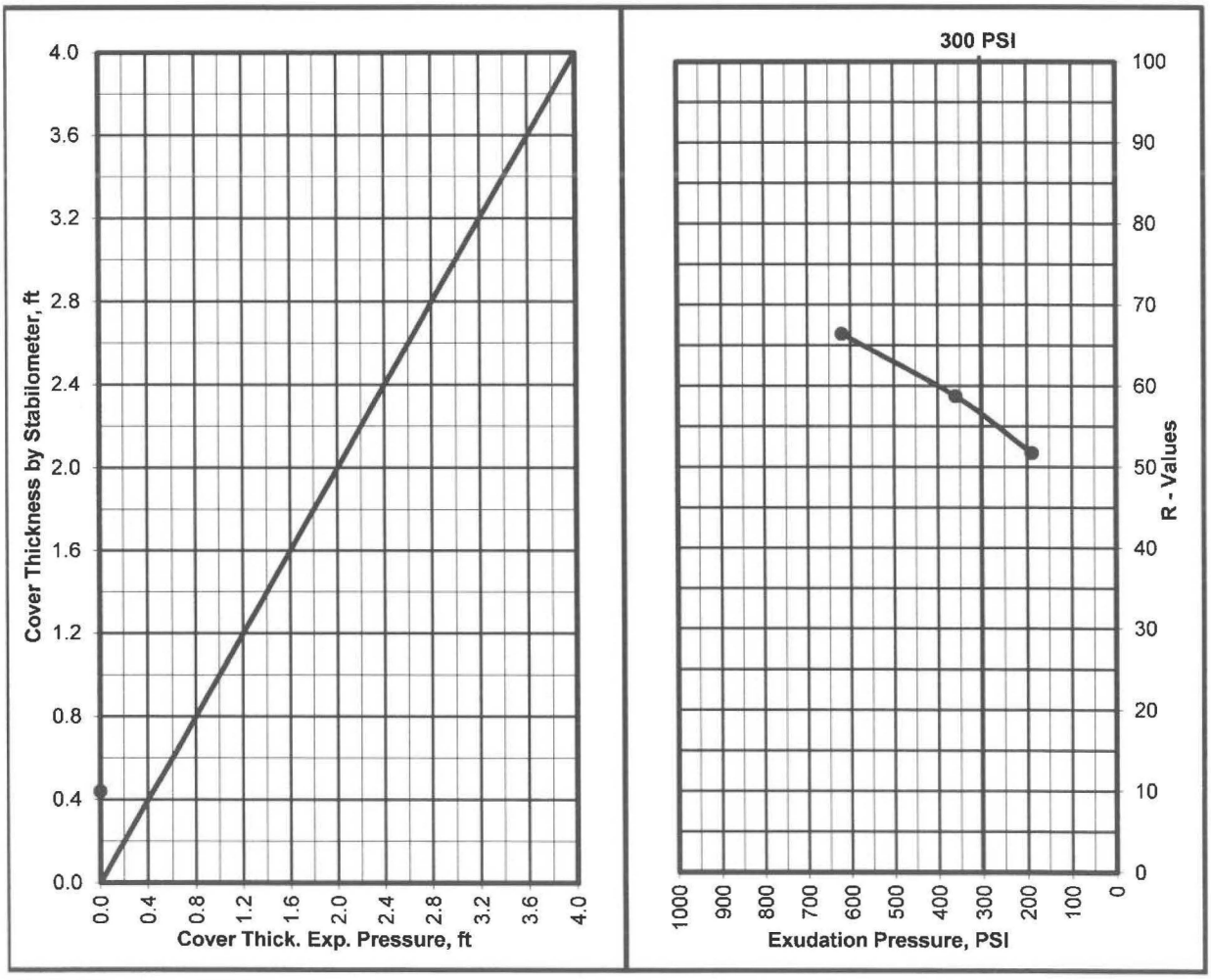
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	012-19206
Project Name	:	Residential Development
Date	:	11/12/2019
Sample Location/Curve Number	:	RV#2
Soil Classification	:	SM

TEST	A	B	C
Percent Moisture @ Compaction, %	9.8	10.7	9.3
Dry Density, lbm/cu.ft.	124.5	122.5	125.1
Exudation Pressure, psi	360	190	620
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	59	52	66

R Value at 300 PSI Exudation Pressure	**56**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



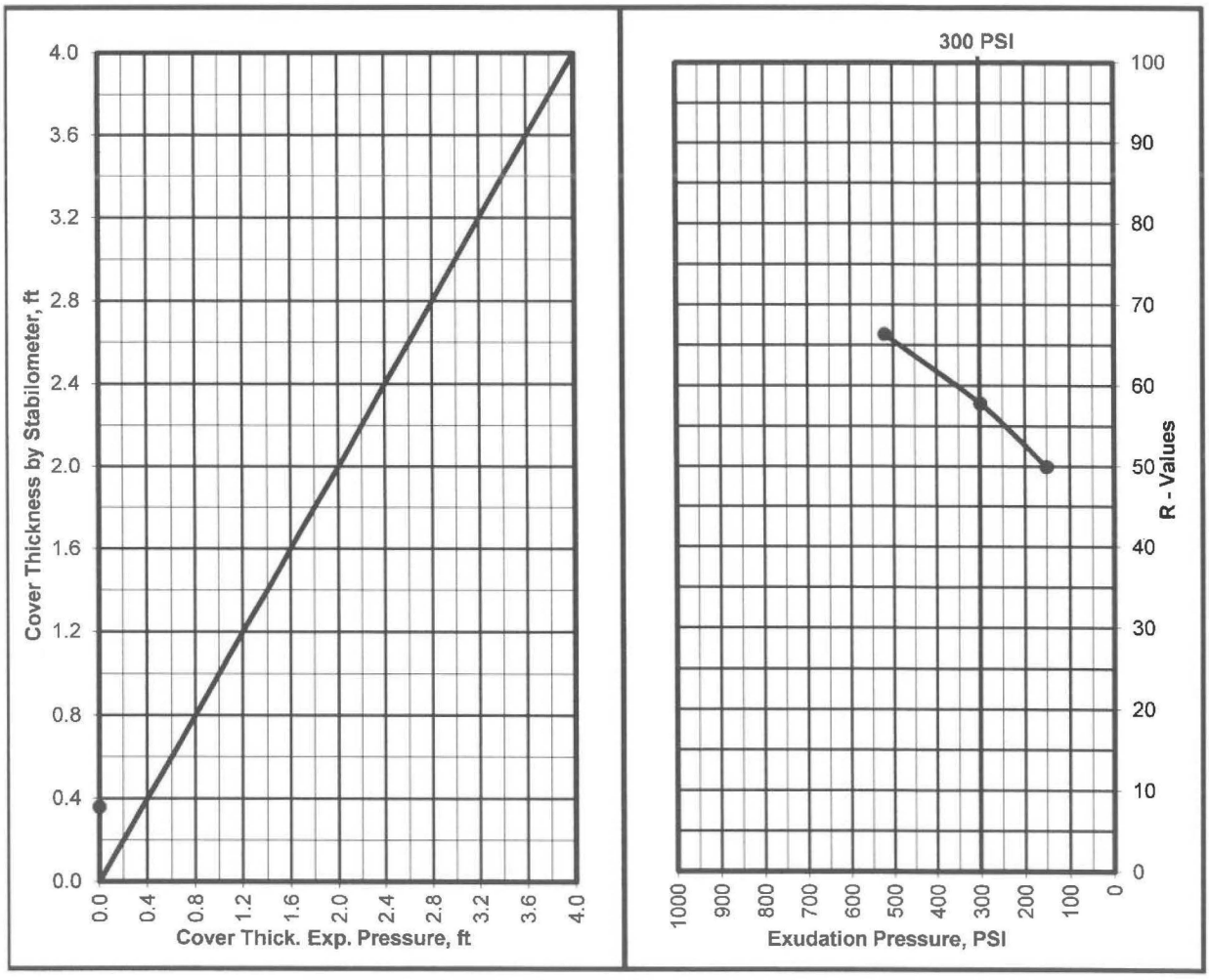
Krazan Testing Laboratory

R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	012-19206
Project Name	:	Residential Development
Date	:	11/12/2019
Sample Location/Curve Number	:	RV#3
Soil Classification	:	SM

TEST	A	B	C
Percent Moisture @ Compaction, %	8.8	9.8	9.3
Dry Density, lbm/cu.ft.	126.3	126.3	126.3
Exudation Pressure, psi	520	150	300
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	66	50	58

R Value at 300 PSI Exudation Pressure	**58**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



Krazan Testing Laboratory

APPENDIX B

EARTHWORK SPECIFICATIONS

GENERAL

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including but not limited to the furnishing of all labor, tools, and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans, and disposal of excess materials.

PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of Krazan and Associates, Inc., hereinafter known as the Soils Engineer and/or Testing Agency. Attainment of design grades when achieved shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

TECHNICAL REQUIREMENTS: All compacted materials shall be densified to a density not less than 90 percent relative compaction based on ASTM Test Method D1557 or CAL-216, as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be as determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the soil report.

The Contractor shall make his own interpretation of the data contained in said report, and the Contractor shall not be relieved of liability under the Contract documents for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or windblown materials attributable to his work.

SITE PREPARATION

Site preparation shall consist of site clearing and grubbing and the preparations of foundation materials for receiving fill.

CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter, and all other matter determined by the Soils Engineer to be deleterious or otherwise unsuitable. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed building areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots larger than 1 inch. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations should not be permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

SUBGRADE PREPARATION: Surfaces to receive Engineered Fill, building or slab loads shall be prepared as outlined above, excavated/scarified to a depth of 12 inches, moisture-conditioned as necessary, and compacted to 90 percent relative compaction.

Loose soil areas, areas of uncertified fill, and/or areas of disturbed soils shall be moisture-conditioned as necessary and recompacted to 90 percent relative compaction. All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any of the fill material.

EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. However, compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer.

Both cut and fill areas shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill are as specified.

APPENDIX C

PAVEMENT SPECIFICATIONS

1. DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term "Standard Specifications": hereinafter referred to is the 2018 Standard Specifications of the State of California, Department of Transportation, and the "Materials Manual" is the Materials Manual of Testing and Control Procedures, State of California, Department of Public Works, Division of Highways. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as defined in the applicable tests outlined in the Materials Manual.

2. SCOPE OF WORK - This portion of the work shall include all labor, materials, tools, and equipment necessary for, and reasonably incidental to the completion of the pavement shown on the plans and as herein specified, except work specifically noted as "Work Not Included."

3. PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 90 percent. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

4. UNTREATED AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class 2 material, 1½ inches maximum size. The aggregate base material shall be spread and compacted in accordance with Section 26 of the Standard Specifications. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent.

5. AGGREGATE SUBBASE - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class 2 material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent, and it shall be spread and compacted in accordance with Section 25 of the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

6. ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10. The mineral aggregate shall be Type B, ½ inch maximum size, medium grading and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning and mixing of the materials shall conform to Section 39.

The prime coat, spreading and compacting equipment and spreading and compacting mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50° F. The surfacing shall be rolled with a combination of steel wheel and pneumatic rollers, as described in Section 39-6. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

7. FOG SEAL COAT - The fog seal (mixing type asphaltic emulsion) shall conform to and be applied in accordance with the requirements of Section 37.

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

Mr. Walter Diamond
Lennar Homes of California, LLC
5 River Park Place, Suite 210
Fresno, California 93720

March 16, 2026

Subject: Applicability of Previous Traffic Impact Study and Updated VMT Analysis
Proposed Tract 6294
Southeast of the Intersection of Grantland and Barstow Avenues
Fresno, California

Dear Mr. Diamond:

INTRODUCTION

This report presents a discussion of the applicability of a traffic impact study report previously prepared for Tract 6294 in Fresno, California. This report also presents an updated vehicle miles traveled analysis for the proposed project. Peters Engineering Group performed a traffic impact study for Tract 6294 and presented the results in a report dated April 22, 2020 (hereinafter referred to as the TIS). The TIS is attached following the figures at the end of this report.

PROJECT DESCRIPTION

The Project site covers approximately 30.74 gross acres and approximately 27.34 net acres located southeast of the intersection of Grantland and Barstow Avenues in Fresno, California. The Project consists of 187 single-family lots. The existing zoning is RS-5. Proposed use is Residential – Medium Density and the proposed zoning is RS-5/UGM (Residential Single-Family Medium Density).

Site access will be via two local streets connecting to Grantland Avenue. The northern street is proposed slightly north of the existing San Ramon Avenue, with a new left-turn lane proposed to allow left turns into the site from southbound Grantland Avenue. A median worm would prevent left turns from eastbound and westbound San Ramon Avenue to Grantland Avenue.

The southern street is proposed slightly north of the existing San Jose Avenue and would be a right-in/right-out access. There is currently a full median opening with left-turn lanes at San Jose Avenue slightly south of the proposed access.

The location of the site is presented in the attached Figure 1, Site Vicinity Map, following the text of this report. The site plan is presented in the attached Figure 2, Site Plan.

PROJECT TRIP GENERATION AND DISTRIBUTION

Data provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*, were used to estimate the number of trips anticipated to be generated by the project. Table 1 presents trip generation estimates presented in the TIS.

Table 1
TIS Project Trip Generation Estimate

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	185	9.44	1,748	0.74	25:75	34	103	137	0.99	63:37	116	68	184

Reference: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers 2017
Rates are reported in trips per dwelling unit.

It is our understanding that the City of Fresno currently utilizes the ITE *Trip Generation Manual, 11th Edition*, and ITE has released ITE *Trip Generation Manual, 12th Edition*. For comparison purposes, Tables 2 and 3 present trip generation estimates for the current version of the project using the more recent ITE data.

Table 2
Project Trip Generation Estimate – 11th Edition

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	187	9.43	1,764	0.70	26:74	34	97	131	0.94	63:37	111	65	176

Reference: *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers 2021
Rates are reported in trips per dwelling unit.

Table 3
Project Trip Generation Estimate – 12th Edition

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	187	9.09		0.70	27:73	35	96	131	0.93	62:38	108	66	174

Reference: *Trip Generation Manual, 12th Edition*, Institute of Transportation Engineers 2025
Rates are reported in trips per dwelling unit.

The results of the trip generation analyses suggest that the current version of the project will generate a number of peak-hour trips similar to, and slightly less than, those that were studied in the TIS. Therefore, with respect to analysis that were based on project trip generation, the TIS remains applicable.

The Veterans Boulevard extension to Shaw Avenue and the Veterans Boulevard interchange were both considered in the TIS. In addition, signalization of the intersection of Grantland and Bullard Avenues was also considered. Therefore, with the respect to changes in the distribution of background trips and Project trips, the TIS remains applicable.

INTERSECTION ANALYSES

The intersection analyses presented in the TIS concluded that traffic signals should be constructed at the following intersections:

- Grantland and Bullard Avenues
- Grantland and Barstow Avenues

Both of these intersections have been signalized since the TIS was completed. Further analysis of these intersections, or the study intersections that were found to operate at acceptable levels of service, is not expected to provide any useful additional information. Therefore, it is our opinion that no further intersection analyses are required. Discussions presented in the TIS relative to queuing at other study intersections and known congestion at the intersection of Shaw and Polk Avenues remain applicable.

VEHICLE MILES TRAVELED (VMT) IMPACT ANALYSIS

Senate Bill (SB) 743 requires that relevant CEQA analysis of transportation impacts be conducted using a metric known as vehicle miles traveled (VMT) instead of level of service. VMT measures how much actual auto travel (additional miles driven) a proposed project would create on California roads. If the project adds excessive car travel onto roads, the project may cause a significant transportation impact.

The State CEQA Guidelines were amended to implement SB 743 by adding Section 15064.3. Among its provisions, Section 15064.3 confirms that, except with respect to transportation projects, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS as a measure of impacts on traffic facilities is no longer a relevant CEQA criteria for transportation impacts.

CEQA Guidelines Section 15064.3(b)(4) states that "[a] lead agency has discretion to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revision to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section."

On June 25, 2020, the City of Fresno adopted *CEQA Guidelines for Vehicle Miles Traveled Thresholds* (hereinafter referred to as the City VMT Guidelines), pursuant to SB 743. The City VMT Guidelines document was prepared and adopted consistent with the requirements of CEQA Guidelines Sections 15064.3 and 15064.7. The December 2018 *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory) published by the Governor's Office of Planning and Research (OPR) was utilized as a reference and guidance document in the preparation of the City VMT Guidelines.

The City VMT Guidelines include a screening standard and criteria that can be used to screen out qualified projects that meet the adopted criteria from a requirement to prepare a detailed VMT analysis.

The City of Fresno also developed a Vehicle Miles Traveled Reduction Program and Nexus Study report dated August 2025 to reduce VMT and associated greenhouse gas emissions while streamlining the environmental compliance process for development projects that generate vehicle trips. The Fresno City Council adopted the VMT Reduction Program on November 6, 2025.

The Project was screened by reviewing the Fresno Council of Governments (COG) interactive screening tool available at the following link:

https://lsa.maps.arcgis.com/apps/dashboards/8c52b2d1f61b48f89312c904935f5d9b

The Project site is located in an area of low VMT per capita and is therefore screened out from further VMT analyses as indicated on the attached Figures 3 and 4. The Project will cause a less-than-significant transportation impact based on VMT.

CONCLUSIONS

Generally-accepted traffic engineering principles and methods were employed to review the TIS and determine that the TIS remains applicable.

A review of the COG interactive screening tool indicates the Project is located in an area of low VMT and will cause a less-than-significant transportation impact based on VMT.

Thank you for the opportunity to continue to work with you on this project. Please feel free to contact our office if you have any questions.

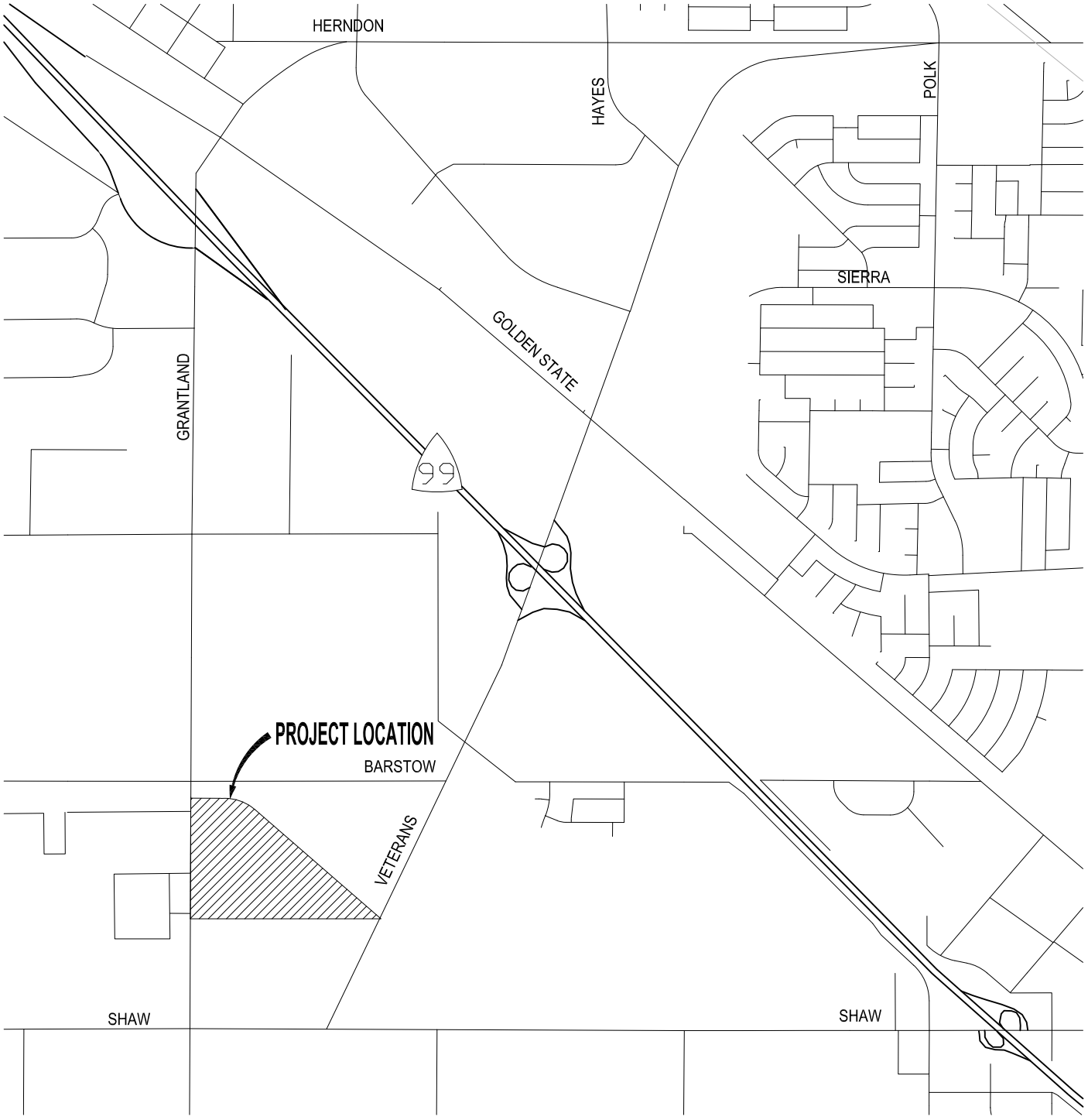
PETERS ENGINEERING GROUP

John Rowland, PE, TE



Attachments: Figures 1 through 4
TIS dated April 22, 2020

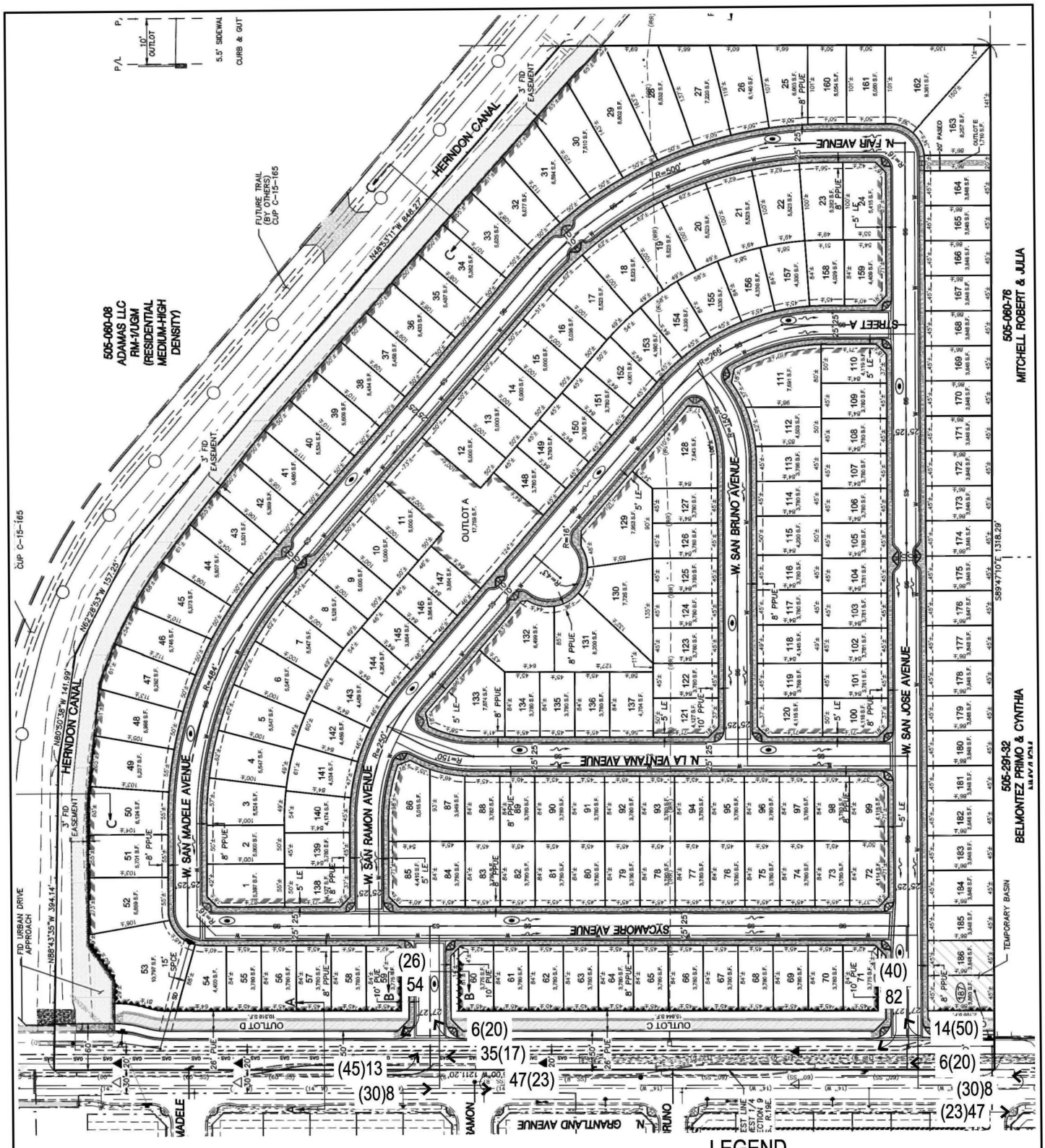
FIGURES



Proposed Tract 6294
Fresno, California

VICINITY MAP

Not to Scale



LEGEND

XX (YY) AM (PM) PEAK HOUR VOLUMES

Proposed Tract 6294
Fresno, California

Not to Scale

SITE PLAN

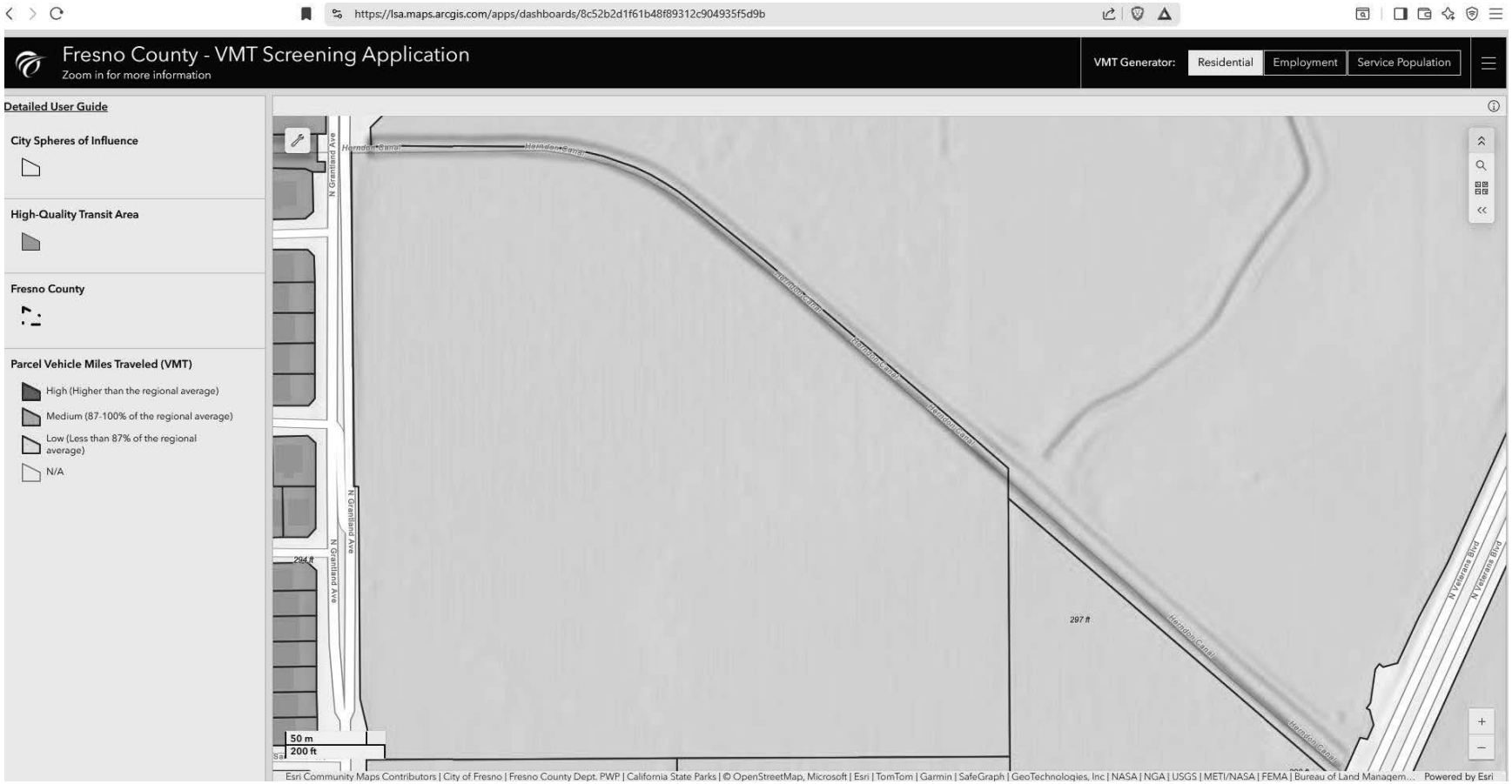

https://lsa.maps.arcgis.com/apps/dashboards/8c52b2d1f61b48f89312c904935f5d9b
Fresno County - VMT Screening Application
Zoom in for more information
VMT Generator:
Residential
Employment
Service Population
Detailed User Guide
City Spheres of Influence
High-Quality Transit Area
Fresno County
Parcel Vehicle Miles Traveled (VMT)
High (Higher than the regional average)
Medium (87-100% of the regional average)
Low (Less than 87% of the regional average)
N/A
Herndon Canal
N Grantland Ave
N Veterans Blvd
294 ft
297 ft
50 m
200 ft
Esri Community Maps Contributors | City of Fresno | Fresno County Dept. PWP | California State Parks | © OpenStreetMap, Microsoft | Esri | TomTom | Garmin | SafeGraph | GeoTechnologies, Inc | NASA | NGA | USGS | METI/NASA | FEMA | Bureau of Land Managem... Powered by Esri

FIGURE 3

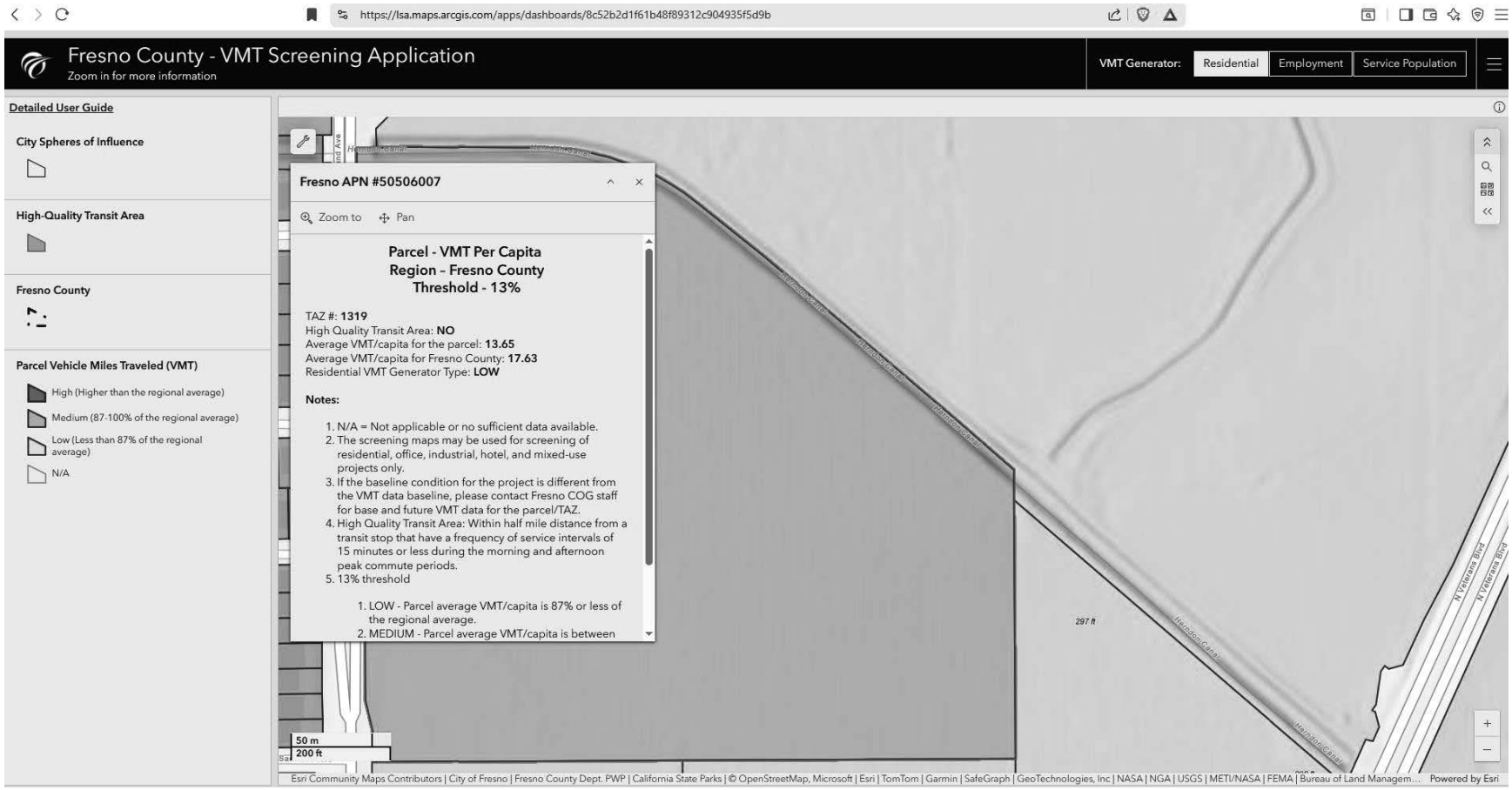

https://lsa.maps.arcgis.com/apps/dashboards/8c52b2d1f61b48f89312c904935f5d9b
Fresno County - VMT Screening Application
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City Spheres of Influence
High-Quality Transit Area
Fresno County
Parcel Vehicle Miles Traveled (VMT)
High (Higher than the regional average)
Medium (87-100% of the regional average)
Low (Less than 87% of the regional average)
N/A
Fresno APN #50506007
Zoom to
Pan
Parcel - VMT Per Capita
Region – Fresno County
Threshold - 13%
TAZ #: 1319
High Quality Transit Area: NO
Average VMT/capita for the parcel: 13.65
Average VMT/capita for Fresno County: 17.63
Residential VMT Generator Type: LOW
Notes:
1. N/A = Not applicable or no sufficient data available.
2. The screening maps may be used for screening of residential, office, industrial, hotel, and mixed-use projects only.
3. If the baseline condition for the project is different from the VMT data baseline, please contact Fresno COG staff for base and future VMT data for the parcel/TAZ.
4. High Quality Transit Area: Within half mile distance from a transit stop that have a frequency of service intervals of 15 minutes or less during the morning and afternoon peak commute periods.
5. 13% threshold
1. LOW - Parcel average VMT/capita is 87% or less of the regional average.
2. MEDIUM - Parcel average VMT/capita is between
297 ft
N Veterans Blvd
50 m
200 ft
Esri Community Maps Contributors | City of Fresno | Fresno County Dept. PWP | California State Parks | © OpenStreetMap, Microsoft | Esri | TomTom | Garmin | SafeGraph | GeoTechnologies, Inc | NASA | NGA | USGS | METI/NASA | FEMA | Bureau of Land Managem... Powered by Esri

FIGURE 4

TIS DATED APRIL 22, 2020

Traffic Impact Study

Proposed Tract 6294

Southeast of the Intersection of
Grantland and Barstow Avenues

Fresno, California

Prepared For:
Lennar Homes, Inc.
8080 North Palm Avenue, Suite 110
Fresno, California 93711

Date: April 22, 2020

Job No.: 19-068.01

Assigned Planner: Chris Lang
Entitlement/Accela (FAASTER) No.: P20-00492

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Mr. Ara Chekerdemian
Lennar Homes, Inc.
8080 North Palm Avenue, Suite 110
Fresno, California 93711

April 22, 2020

Subject: Traffic Impact Study
Proposed Tract 6294
Southeast of the Intersection of Grantland and Barstow Avenues
Fresno, California

Dear Mr. Chekerdemian:

1.0 INTRODUCTION

This report presents the results of a traffic impact study for the proposed Tract 6294 in Fresno, California. This analysis focuses on the anticipated effect of vehicle traffic resulting from the project and was performed in accordance with the City of Fresno *Traffic Impact Study Report Guidelines* updated February 2, 2009 and agency responses to a scope request letter dated December 6, 2019 (presented in Appendix A). A completed version of the current City of Fresno, Public Works Department Traffic Study Checklist (TSC) is presented in Appendix B.

2.0 PROJECT DESCRIPTION

The Project site covers approximately 30.74 gross acres and approximately 29.32 net acres located southeast of the intersection of Grantland and Barstow Avenues in Fresno, California. The Project consists of 185 single-family lots. A General Plan Amendment (GPA) will be required to change the land use from Regional Mixed Use allowing between 30 and 45 dwelling units per acre to a different land use allowing the proposed density of approximately 6 to 7 dwelling units per acre.

Site access will be via two local streets connecting to Grantland Avenue. The northern street is proposed slightly north of the existing San Ramon Avenue, with a new left-turn lane proposed to allow left turns into the site from southbound Grantland Avenue. A median worm would prevent left turns from eastbound and westbound San Ramon Avenue to Grantland Avenue.

The southern street is proposed slightly north of the existing San Jose Avenue and would be a right-in/right-out access. There is currently a full median opening with left-turn lanes at San Jose Avenue slightly south of the proposed access.

Future connectivity will be provided at the eastern edge of the site for approximately 16 single-family residences that would likely require access through the Project site.

The location of the site is presented in the attached Figure 1, Site Vicinity Map, following the text of this report. The site plan is presented in the attached Figure 2, Site Plan.

3.0 STUDY AREA AND TIME PERIOD

The study locations were determined based on consultation with City of Fresno staff, County of Fresno staff, and Caltrans staff considering anticipated Project trip distribution, the size of the Project, and the existing conditions in the vicinity of the Project site. The correspondence is presented in Appendix A. This report includes analysis of the following intersections:

1. Grantland Avenue / Bullard Avenue
2. Grantland Avenue / Barstow Avenue
3. Grantland Avenue / North Site Access / San Ramon Avenue
4. Grantland Avenue / South Site Access / San Jose Avenue
5. Grantland Avenue / Shaw Avenue
6. Polk Avenue / Shaw Avenue

The study time periods include the weekday a.m. and p.m. peak hours determined between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. The peak hours are analyzed for the following conditions:

- Existing Conditions;
- Existing-Plus-Project Conditions;
- Near-Term With-Project Conditions;
- Cumulative (Year 2040) No-Project Conditions (assumes site is built out per the current General Plan); and
- Cumulative (Year 2040) Conditions With Project.

4.0 ANALYSES REQUIRED

The analyses required were determined based on the City of Fresno *Traffic Impact Study Report Guidelines* updated February 2, 2009 and consultation with City of Fresno staff, County of Fresno staff, and Caltrans staff considering anticipated Project trip distribution, the size of the Project, and the existing conditions in the vicinity of the Project site. The correspondence is presented in Appendix A. The City of Fresno indicated that the following types of analyses are required:

- Intersection operational analyses (levels of service and queuing)
- Peak-hour traffic signal warrants at unsignalized intersections
- Five-year collision history at study intersections
- Estimate of vehicle miles travelled (VMT)

5.0 LEVEL OF SERVICE

The Transportation Research Board *Highway Capacity Manual*, 2010, (HCM2010) defines level of service (LOS) as, "A quantitative stratification of a performance measure or measures that represent quality of service, measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst." Automobile mode LOS characteristics for both unsignalized and signalized intersections are presented in Tables 1 and 2.

Table 1
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Average Vehicle Delay (seconds)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

Table 2
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Volume-to-capacity ratio is low. Progression is exceptionally favorable or the cycle length is very short.	<10
B	Volume-to-capacity ratio is low. Progression is highly favorable or the cycle length is very short.	>10-20
C	Volume-to-capacity ratio is no greater than 1.0. Progression is favorable or cycle length is moderate.	>20-35
D	Volume-to-capacity ratio is high but no greater than 1.0. Progression is ineffective or cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35-55
E	Volume-to-capacity ratio is high but no greater than 1.0. Progression is unfavorable and cycle length is long. Individual cycle failures are frequent.	>55-80
F	Volume-to-capacity ratio is greater than 1.0. Progression is very poor and cycle length is long. Most cycles fail to clear the queue.	>80

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

6.0 SIGNIFICANCE CRITERIA

6.1 Level of Service

The City of Fresno General Plan includes the following policies pertaining to vehicular LOS that are relevant to the proposed Project:

MT-1-k **Multi-Modal Level of Service Standards.** Develop and use a tiered system of flexible, multi-modal Level of Service standards for streets designated by the Circulation Diagram (Figure MT-1). Strive to accommodate a peak hour vehicle LOS of D or better on street segments and at intersections, except where Policies MT-1-m through MT-1-p provide greater specificity. Establish minimum acceptable service levels for other modes and use them in the development and environmental review process.

MT-1-n **Peak Hour Vehicle LOS.** Maintain a peak-hour vehicle LOS standard of D or better for all roadway areas outside of identified Activity Center and Bus Rapid Transit Corridor districts, unless the City Traffic Engineer determines that

mitigation to maintain this LOS would be infeasible and/or conflict with the achievement of other General Plan policies.

MT-1-o **LOS Deviations Outside of Activity Centers and Areas Designated for Mixed-Use.** Accept vehicle LOS E or F conditions outside of identified multi-modal districts only if provisions commensurate with the level of impact and approved by the City Traffic Engineer are made to sufficiently improve the overall transportation system and/or promote non-vehicular transportation as part of a development project or City-initiated project.

MT-2-i **Transportation Impact Studies.** Require a Transportation Impact Study (currently named Traffic Impact Study) to assess the impacts of new development projects on existing and planned streets for projects meeting one or more of the following criteria, unless it is determined by the City Traffic Engineer that the project site and surrounding area already has appropriate multi-modal infrastructure improvements:

- When a project includes a General Plan amendment that changes the General Plan Land Use Designation.
- When the project will substantially change the off-site transportation system (auto, transit, bike or pedestrian) or connection to the system, as determined by the City Traffic Engineer.
- Transportation impact criteria are tiered based on a project's location within the City's Sphere of Influence. This is to assist with areas being incentivized for development. The four zones, as defined on Figure MT-4, are listed below. The following criteria apply:
    - Traffic Impact Zone I (TIZ-I): TIZ-I represents the Downtown Planning Area. Maintain a peak hour LOS standard of F or better for all intersections and roadway segments. A TIS will be required for all development projected to generate 200 or more peak hour new vehicle trips.
    - Traffic Impact Zone II (TIZ-II): TIZ-II generally represents areas of the City currently built up and wanting to encourage infill development. Maintain a peak hour LOS standard of E or better for all intersections and roadway segments. A TIS will be required for all development projected to generate 200 or more peak hour new vehicle trips.
    - Traffic Impact Zone III (TIZ-III): TIZ-III generally represents areas near or outside the City Limits but within the SOI as of December 31, 2012. Maintain a peak hour LOS standard of D or better for all intersections and roadway segments. A TIS will be required for all development projected to generate 100 or more peak hour new vehicle trips.
    - Traffic Impact Zone IV (TIZ-IV): TIZ-IV represents the southern employment areas within and planned by the City. Maintain a peak hour LOS standard of E or better for all intersections and roadway segments. A

TIS will be required for all development projected to generate 200 or more peak hour new vehicle trips.

The proposed Project site and the study intersections are located in TIZ-III. For purposes of this study, a significant traffic impact will be identified if:

- the proposed Project will decrease the LOS below D at an intersection; or
- the proposed Project will exacerbate an existing deficiency at an intersection already operating below LOS D by increasing the average delay per vehicle at the intersection by 5.0 seconds or more.

6.2 Intersection Queuing

The City of Fresno *Traffic Impact Study Report Guidelines* dated January 20, 2009 require a queuing analysis of the study intersections and recommendations for queues that are projected to exceed the available storage capacity. However, it should be noted that queuing is not included in the significance criteria recognized by the City and is reviewed to confirm the LOS results. Where excessive queues are expected, the LOS results may not be applicable due to blocking of adjacent lanes.

A queuing deficiency is identified if the calculated 95th-percentile queue length exceeds the storage length by more than 25 feet (the average storage length for one vehicle) since the bay taper can typically store approximately one vehicle.

6.3 Transit, Bicycle, and Pedestrian Facilities

A significant impact will be identified if the proposed Project would disrupt or impede existing or planned transit, bicycle, or pedestrian facilities.

7.0 PLANNING AND FUNDING

7.1 City of Fresno General Plan

The City of Fresno General Plan designates the roadways in the study area as follows:

- Grantland Avenue: Arterial north of Shaw Avenue, Collector south of Shaw Avenue
- Bullard Avenue: Collector
- Barstow Avenue: Collector
- Shaw Avenue: Arterial
- Polk Avenue: Collector
- San Ramon Avenue: Local road
- San Jose Avenue: Local road

7.2 City of Fresno Traffic Signal Mitigation and Major Street Impact Fees

The City of Fresno Traffic Signal Mitigation Impact (TSMI) fee program and the Fresno Major Street Impact (FMSI) fee program provide funds for construction of specified traffic signals and major street segments.

The TSMI fee program (September 2016) includes the following intersections:

1. Grantland Avenue / Bullard Avenue: eight-phase signals with intelligent transportation facilities (ITS) at an amount of $363,600. In addition, the intersection

is listed as Priority Ranking 21 on the City of Fresno 2019 New Traffic Signal Locations list with a construction cost estimate of $681,975.

2. Grantland Avenue / Barstow Avenue: eight-phase signals with intelligent transportation facilities (ITS) at an amount of $404,600. In addition, the intersection is listed as Priority Ranking 68 on the City of Fresno 2019 New Traffic Signal Locations list with a construction cost estimate of $757,750. The City of Fresno has initiated the construction phase of a capital improvement project to install traffic signals at the intersection.
3. Grantland Avenue / Shaw Avenue: eight-phase signals with intelligent transportation facilities (ITS) at an amount of $1,200,000. The intersection was recently signalized by the County of Fresno and is currently in design for intersection widening and signal modification by Tract 6198.
4. Polk Avenue / Shaw Avenue: eight-phase signals at an amount of $295,200. The intersection already has eight-phase signals.

The Project site is located within the new growth area with respect to the FMSI fee program.

7.3 Measure C

In 1986, the voters of Fresno County approved Measure C, which created a half-cent sales tax for 20 years to provide a source of funds for specified transportation improvement projects within Fresno County. Money generated through the Measure C program is used for various improvements to extend freeways, improve roads, and enhance public safety. In its first 20 years (1986 to 2006) Measure C funded over $1 billion of improvements. In 2006, the voters approved the extension of Measure C from 2007 to 2027, and it is projected to generate $1.7 billion over its 20-year life. Measure C authorizes the establishment of a Regional Transportation Mitigation Fee (RTMF) program to provide additional funding for regional transportation projects through new fees charged to development projects. The RTMF program was enacted by the County of Fresno and all cities within the County and became effective on January 1, 2009. The program is administered by a Joint Powers Authority (JPA) that was formed for the specific purpose of managing the fee program. In accordance with State law, a nexus study was completed that analyzed the growth of travel demand for each jurisdiction, identified regional road improvements to meet such demands, described the appropriate "nexus" between such demand and improvements, and adopted appropriate mitigation fees applicable to various land use categories. The current RTMF fee rate for market-rate single-family developments is $2,118.00 per dwelling unit. The current RTMF fee rate for affordable single-family developments is $1,059.00 per dwelling unit.

8.0 LANE CONFIGURATIONS AND INTERSECTION CONTROL

The lane configurations and intersection control at the study intersections are presented in the following figures:

Figure 3, Existing Lane Configurations and Intersection Control;
Figure 4, Existing-Plus-Project Lane Configurations and Intersection Control;
Figure 5, Near-Term With-Project Lane Configurations and Intersection Control.

For purposes of these analyses, it is assumed that the lane configurations presented in Figure 5 will remain the same through the year 2040 unless mitigation measures are required.

9.0 EXISTING TRAFFIC VOLUMES

Existing peak-hour traffic volumes at the study intersections were determined by performing manual turning-movement counts between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. on a weekday. The data sheets are presented in Appendix C and indicate the date the counts were performed. The existing peak-hour turning movement volumes are presented in the attached Figure 6, Existing Peak-Hour Traffic Volumes.

10.0 PROJECT TRIP GENERATION AND DISTRIBUTION

10.1 Project Trip Generation

Data provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*, are typically used to estimate the number of trips anticipated to be generated by proposed projects. Table 3 presents trip generation estimates for the Project.

Table 3
Project Trip Generation Estimate

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	185	9.44	1,748	0.74	25:75	34	103	137	0.99	63:37	116	68	184

Reference: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers 2017
Rates are reported in trips per dwelling unit.

10.2 Adjacent Site Trip Generation

The Project provides for connectivity to the site immediately east of the Project site. It is anticipated that the site to the east will be landlocked and will require access through the proposed Project. For purposes of the analyses, trips expected to be generated by an additional 16 residences east of the Project site are considered in the analyses. Table 4 presents trip generation estimates for the additional 16 residences to the east of the Project.

Table 4
Adjacent Site Trip Generation Estimate

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	16	9.44	152	0.74	25:75	3	9	12	0.99	63:37	10	6	16

Reference: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers 2017
Rates are reported in trips per dwelling unit.

10.3 Project Trip Distribution and Assignment

The regional distribution of Project trips can be estimated by performing a select zone analysis using available travel models. The trip generation information and other relevant Project data were provided to the Fresno Council of Governments (COG) to perform a select

zone analysis. The select zone analysis request submitted to COG and the results of the select zone analysis performed by COG are presented in Appendix D.

The percentage distribution of Project traffic is presented in Figure 7, Project Trip Distribution Percentages. Project traffic volumes at the study intersections are presented in the figures listed below. The future completion of Veterans Boulevard, including an interchange at State Route 99, is expected to result in different Project traffic volumes at the study intersections in the future.

Figure 8, Peak-Hour Project Traffic Volumes;
Figure 9, Year 2040 Peak-Hour Project Traffic Volumes.

10.4 Trip Generation – Current General Plan Land Use

For comparison purposes, an estimate of the number of trips that potentially could have been generated by a project constructed based on the current Regional Mixed Use land use designation is presented below. The Regional Mixed Use land use allows up to 45 dwelling units per acre. Based on the allowable density, it is estimated that the site could yield as many as approximately 1,215 multi-family units. An estimate of the number of trips that could be generated at the site based on the current Regional Mixed Use zoning with residential development is presented in Table 5.

Table 5
Trip Generation Calculations - Current Land Use Designation

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Multifamily Housing (Mid Rise) (221)	1,215	5.44	6,610	0.36	26:74	114	324	438	0.44	61:39	326	209	535

Reference: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers 2017
Rates are reported in trips per dwelling unit.

Table 6 presents the net Project trip generation by taking the difference between the current land use designation trip generation (Table 5) and the proposed Project trip generation (Table 3).

Table 6
Net Project General Plan Trip Generation

Land Use	Daily	A.M. Peak Hour			P.M. Peak Hour		
		In	Out	Total	In	Out	Total
Proposed	1,748	34	103	137	116	68	184
Current	6,610	114	324	438	326	209	535
Difference	**-4,862**	**-80**	**-221**	**-301**	**-210**	**-141**	**-351**

The results of the trip generation analyses suggest that the Project will result in substantially fewer trips than would be expected under the current land use designation.

10.5 Project Vehicle Miles Travelled (VMT)

The select zone analysis performed by the COG provides an estimate of the average trip length for Project trips. The output, presented in Appendix D, indicates an average trip length of 7.25 miles in each direction (total trip length of 14.5 miles). Considering a daily volume of 1,748 trips (874 entering and 874 exiting), the Project will generate 12,673 VMT per day. However, as compared to the General Plan, assuming the same trip length, the site would have generated 47,923 VMT per day. Therefore, the Project will result in a net decrease of 35,250 trips per day in anticipated VMT generated at the site.

11.0 EXISTING-PLUS-PROJECT TRAFFIC VOLUMES

The existing-plus-Project peak-hour turning movement volumes are presented in the attached Figure 10, Existing-Plus-Project Peak-Hour Traffic Volumes.

12.0 CUMULATIVE PROJECTS

The traffic analyses for the near-term and long-term conditions consider the effects of traffic expected to be generated by pending and approved projects in the study area. The City of Fresno provided a list of projects and the project status that were considered in the near-term and long-term conditions analysis scenarios. The list is presented in Appendix E.

In addition to the projects listed in Appendix E, Veterans Boulevard is expected to be extended to Shaw Avenue by the year 2021. The Veterans Boulevard interchange at State Route 99 is expected to be constructed by approximately 2024. Finally, the City of Fresno has initiated the construction phase of a capital improvement project to install traffic signals at the intersection of Grantland and Bullard Avenues.

13.0 NEAR-TERM WITH-PROJECT TRAFFIC VOLUMES

The near-term with-Project peak-hour turning movement volumes are presented in the attached Figure 11, Near-Term With-Project Peak-Hour Traffic Volumes. The near-term volumes include the existing traffic volumes, cumulative projects, and the proposed Project.

14.0 CUMULATIVE YEAR 2040 TRAFFIC VOLUMES

COG maintains an activity-based travel model that is typically used to forecast future traffic volumes. Cumulative (year 2040) traffic volumes were projected using the Increment Method, which is described in a document available from the COG entitled *"Model Steering Committee Recommended Procedures for Using Traffic Projections from the Fresno COG Travel Model dated December 2002."* In general, the Increment Method forecasts future traffic volumes by estimating the additional trips that will result from regional growth as calculated by the model between the base year and the horizon year. The additional trips are added to the existing traffic volumes, resulting in a forecast of the future traffic volumes. The Fresno County travel model data output is attached.

The cumulative year 2040 no-Project traffic volumes at the study intersections, which include the assumption that the Project site is built out in accordance with the current General Plan land use designation, are presented in the attached Figure 12, Year 2040 Cumulative No-Project Peak-Hour Traffic Volumes. The cumulative year 2040 traffic volumes with the

Project at the study intersections are presented in the attached Figure 13, Year 2040 Cumulative With-Project Peak-Hour Traffic Volumes.

15.0 BICYCLE AND PEDESTRIAN FACILITIES

15.1 Bicycle Facilities

The City of Fresno *Active Transportation Plan* (ATP) dated December 2016 refers to the Caltrans *Highway Design Manual* for classification of bicycle facilities as follows:

- Class I Bikeway (Bike Path): Off-street facilities that provide exclusive use for non-motorized travel, including bicyclists and pedestrians.
- Class II Bikeway (Bike Lane): On-street facilities that use striping, stencils, and signage to denote preferential or exclusive use by bicyclists.
- Class III Bikeway (Bike Route): On-street pavement markings or signage that connect the bicycle roadway network along corridors that do not provide enough space for dedicated lanes on low-speed and low-volume streets.
- Class IV Bikeway (Separated Bikeways): Physically separated bicycle facilities that are distinct from the sidewalk and designed for exclusive use by bicyclists. Commonly known as "cycle tracks," they are located within the street right-of-way, but provide similar comfort when compared to Class I Bikeways.

Figure 48 of the ATP identifies a proposed bikeway system with Class II bike lanes on all of the major streets at the study intersections, with the following exceptions:

- Barstow Avenue east of Grantland Avenue;
- Shaw Avenue west of Grantland Avenue;
- Island Waterpark Drive (Polk Avenue) north of Shaw Avenue.

The ATP also identifies a Class I bike path along Veterans Boulevard and on the south side of Barstow Avenue near the Project site.

The Project is not expected to disrupt or impede existing or planned bicycle facilities.

15.2 Pedestrian Facilities

Pedestrian connectivity is not well established in the general vicinity of the site. Sidewalks typically exist only within, and along the frontage of, adjacent residential developments. The Project would be required to construct sidewalks along its frontage. The Project is not expected to disrupt or impede existing or planned pedestrian facilities.

16.0 SITE CIRCULATION AND ACCESS

As required by the City of Fresno *Traffic Impact Study Report Guidelines*, a review of the proposed site plan is performed to identify potential issues related to on-site circulation and site access. At a minimum, the Project should be designed in accordance with the following City documents and standards:

- City of Fresno Parking Manual; and
- City of Fresno Public Works Standards for driveways.

The map appears to provide adequate circulation throughout the site.

17.0 TRANSIT

Fresno Area Express (FAX) provides bus service to the Fresno area. FAX Route 12 is the nearest to the Project site, with its nearest point being the intersection Shaw and Hayes Avenues. The Project is not expected to disrupt or impede existing transit facilities.

18.0 INTERSECTION ANALYSES

The levels of service at the study intersections were determined using the computer program Synchro 9, which is based on HCM2010 procedures for calculating levels of service. The intersection analysis sheets are presented in Appendix F.

Peak-hour factors (PHF) for the existing conditions were determined from the traffic counts. It is common industry practice to assume a PHF of 0.92 in urban areas for future conditions or in the absence of field data. For purposes of the cumulative year 2040 analyses performed for this study, a PHF of 0.92 is used unless the existing PHF is greater than 0.92.

The California State Transportation Agency and California Department of Transportation *California Manual on Uniform Traffic Control Devices, 2014 Edition (Revision 4 dated March 29, 2019)* (CMUTCD) presents various criteria (warrants) for determining the need for traffic signals. The CMUTCD states that an engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location. The investigation of the need for a traffic control signal typically includes an analysis of the applicable factors contained in the following traffic signal warrants:

Warrant 1, Eight-Hour Vehicular Volume.
Warrant 2, Four-Hour Vehicular Volume.
Warrant 3, Peak Hour.
Warrant 4, Pedestrian Volume.
Warrant 5, School Crossing.
Warrant 6, Coordinated Signal System.
Warrant 7, Crash Experience.
Warrant 8, Roadway Network.
Warrant 9, Intersection Near a Grade Crossing

For purposes of this study, the City requires only Warrant 3, Peak Hour, to be analyzed. The peak-hour traffic signal warrants sheets are presented in Appendix F.

The installation of a traffic signal can serve as a mitigation measure when a significant impact is identified at an unsignalized intersection and traffic signal warrants are satisfied. If warrants are not satisfied, traffic signals would not be considered as a feasible mitigation. For cases in which peak hour traffic signal warrants are satisfied, traffic signals are not considered to be the default mitigation measure. Since installation of traffic signals typically includes construction of additional lanes or widening of the intersection, the development of recommendations for mitigation measures includes consideration of widening the intersection to add capacity while maintaining stop-sign control. If the addition of lanes results in acceptable levels of service then the installation of traffic signals may be considered over-mitigation and may not be recommended, even if peak-hour traffic signal warrants are satisfied.

Tables 7 through 11 present the results of the intersection operational analyses. Levels of service worse than the target LOS, and the corresponding delays, are indicated in bold type and are underlined. The results of the peak-hour traffic signal analyses at unsignalized intersections of major streets are also presented.

Table 7
Intersection LOS Summary – Existing Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Warrant	Delay (sec)	LOS	Warrant
Grantland /Bullard	Two-Way Stop	**37.2**	**E**	Met	34.5	D	Not met
Grantland /Barstow	Two-Way Stop	17.0	C	Not met	17.2	C	Not met
Grantland /San Ramon	One-Way Stop	10.0	B		9.6	A	
Grantland /San Jose	One-Way Stop	16.6	C		15.9	C	
Grantland / Shaw	Signals	19.8	B		20.7	C	
Polk / Shaw	Signals	33.2	C		29.9	C	

Table 8
Intersection LOS Summary – Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Warrant	Delay (sec)	LOS	Warrant
Grantland /Bullard	Two-Way Stop	**42.2**	**E**	Met	**39.9**	**E**	Not met
Grantland /Barstow	Two-Way Stop	20.4	C	Not met	22.6	C	Not met
Grantland /San Ramon	One-Way Stop	11.2	B		10.7	B	
Grantland /San Jose	One-Way Stop	18.4	C		18.2	C	
Grantland / Shaw	Signals	20.5	C		22.0	C	
Polk / Shaw	Signals	35.9	D		31.2	C	

* Left turns from San Ramon Avenue to Grantland Avenue are not permitted.

Table 9
Intersection LOS Summary – Near-Term With-Project Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Warrant	Delay (sec)	LOS	Warrant
Grantland /Bullard	Signals	17.4	B		14.1	B	
Grantland /Barstow	Two-Way Stop	**38.7**	**E**	Not met	**50.3**	**F**	Met
Grantland /San Ramon	One-Way Stop	12.0	B		11.5	B	
Grantland /San Jose	One-Way Stop	22.2	C		22.0	C	
Grantland / Shaw	Signals	23.6	C		31.2	C	
Polk / Shaw	Signals	**151.8**	**F**		**124.5**	**F**	

* Left turns from San Ramon Avenue to Grantland Avenue are not permitted.

Table 10
Intersection LOS Summary – 2040 No-Project Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Warrant	Delay (sec)	LOS	Warrant
Grantland /Bullard	Signals	14.1	B		13.0	B	
Grantland /Barstow	Two-Way Stop	**131.9**	**F**	Met	**>300**	**F**	Met
Grantland /San Ramon	One-Way Stop	13.9	B		11.5	B	
Grantland /San Jose	One-Way Stop	21.7	C		25.1	D	
Grantland / Shaw	Signals	34.2	C		49.7	D	
Polk / Shaw	Signals	**137.1**	**F**		**129.5**	**F**	

* Left turns from San Ramon Avenue to Grantland Avenue are not permitted.

Table 11
Intersection LOS Summary – 2040 With-Project Conditions

Intersection	Control	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Warrant	Delay (sec)	LOS	Warrant
Grantland /Bullard	Signals	14.0	B		12.8	B	
Grantland /Barstow	Two-Way Stop	**57.4**	**F**	Not met	**122.6**	**F**	Met
Grantland /San Ramon	One-Way Stop	11.9	B		10.8	B	
Grantland /San Jose	One-Way Stop	18.9	C		20.7	C	
Grantland / Shaw	Signals	30.9	C		41.5	D	
Polk / Shaw	Signals	**133.3**	**F**		**126.2**	**F**	

* Left turns from San Ramon Avenue to Grantland Avenue are not permitted.

The results of the intersection operational analyses include an estimate of the 95th-percentile queue lengths. The existing storage capacity and the calculated 95th-percentile queue lengths are presented in Tables 12 and 13. The storage capacities reported in Tables 12 and 13 are based on measurements from available aerial photographs. Queue lengths that exceed the storage capacity are indicated in bold type and are underlined.

Table 12
Intersection Queuing Summary – Existing and Near-Term Scenarios

Intersection	Existing Storage Length (feet)	95th-Percentile Queue Length (feet)					
Approach Lane		Existing		Existing Plus Project		Near-Term With Project	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Grantland / Bullard							
Eastbound L	255 (215)	18	8	18	10	29	22
Eastbound T	*	3	3	3	3	12	11
Eastbound R	S						
Westbound L	200+	5	8	5	8	14	18
Westbound T	*	5	3	5	3	12	11
Westbound R	250+	40	13	45	13	47	5
Northbound L	255	0	0	0	0	12	16
Northbound T (2)	*	DNS	DNS	DNS	DNS	157	114
Northbound R	185	DNS	DNS	DNS	DNS	0	0
Southbound L	250	10	10	10	10	90	90
Southbound T	*	DNS	DNS	DNS	DNS	212	359
Southbound R	S (75)					0	0
Grantland / Barstow							
Eastbound LTR	*	18	13	20	15	30	28
Westbound LTR	*	13	13	18	25	75	88
Northbound L	280	0	3	0	3	0	3
Northbound T	*	DNS	DNS	DNS	DNS	DNS	DNS
Northbound R	S						
Southbound L	250	3	3	3	3	3	5
Southbound T	*	DNS	DNS	DNS	DNS	DNS	DNS
Southbound R	S						
Grantland /San Ramon							
Eastbound R	*	5	3	5	3	5	3
Westbound R	DNE			8	3	8	5
Northbound L	155	0	3	5	5	5	5
Northbound T	*	DNS	DNS	DNS	DNS	DNS	DNS
Northbound R	DNE						
Southbound L	DNE			0	3	0	3
Southbound T (2)	575	DNS	DNS	DNS	DNS	DNS	DNS
Southbound R	S						
Grantland / San Jose							
Eastbound LTR	120	18	10	20	13	25	15
Westbound LTR	Private	0	0	0	0	0	0
Northbound L	105	0	3	0	3	0	3
Northbound T	*	DNS	DNS	DNS	DNS	DNS	DNS
Northbound R	S						
Southbound L	180	3	3	3	3	3	5
Southbound T	*	DNS	DNS	DNS	DNS	DNS	DNS
Southbound R	S						

L: Left-turn lane T: Through lane R: Right-turn lane S: Shared
DNS: Does not stop DNE: Does not exist
* Storage length exceeds 1,000 feet to the next major intersection.
\+ Connects to a two-way left-turn lane or through lane that provides additional storage.

Table 12 (Continued)
Intersection Queuing Summary – Existing and Near-Term Scenarios

Intersection	Existing Storage Length (feet)	95th-Percentile Queue Length (feet)					
Approach Lane		Existing		Existing Plus Project		Near-Term With Project	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Grantland / Shaw							
Eastbound L	305 (250)	89	101	91	108	103	130
Eastbound T	*	212	156	213	156	230	163
Eastbound R	S						
Westbound L	305 (260)	40	54	40	54	42	60
Westbound T	*	222	302	227	318	284	454
Westbound R	S						
Northbound L	150 (230)	40	28	40	28	41	28
Northbound T	*	169	173	173	191	204	265
Northbound R	S						
Southbound L	150 (270)	**156**	134	**176**	145	237	217
Southbound T	*	203	188	227	199	177	166
Southbound R	S (130)					32	21
Polk / Shaw							
Eastbound L	195	19	17	19	17	60	57
Eastbound T (2)	*	208	189	218	194	559	446
Eastbound R	110	0	0	0	0	0	0
Westbound L	160+	193	288	193	288	319	**618**
Westbound T	460	278	429	283	448	**689**	**1,074**
Westbound R	125+	0	54	0	61	31	163
Northbound L	105	48	39	48	39	74	57
Northbound T	*	104	105	104	105	442	263
Northbound R	S						
Southbound L	120	**183**	**152**	**222**	**177**	**373**	**327**
Southbound T	*	31	67	31	67	47	95
Southbound R	S						

L: Left-turn lane T: Through lane R: Right-turn lane S: Shared

* Storage length exceeds 1,000 feet to the next major intersection.

Values in parentheses indicate storage lengths currently indicated on design plans for approved projects.

Table 13
Intersection Queuing Summary – 2040 Scenarios

Intersection	Existing Storage Length (feet)	95th-Percentile Queue Length (feet)			
Approach Lane		2040 No Project		2040 With Project	
		A.M.	P.M.	A.M.	P.M.
Grantland / Bullard					
Eastbound L	255 (215)	32	26	32	21
Eastbound T	*	17	16	17	15
Eastbound R	S				
Westbound L	200+	18	26	18	24
Westbound T	*	20	18	20	17
Westbound R	250+	44	6	44	4
Northbound L	255	13	19	13	17
Northbound T (2)	*	129	98	121	91
Northbound R	185	0	0	0	0
Southbound L	250	62	69	61	64
Southbound T	*	177	277	171	267
Southbound R	S (75)	0	0	0	0
Grantland / Barstow					
Eastbound LTR	*	85	43	65	35
Westbound LTR	*	190	448	110	245
Northbound L	280	0	3	0	3
Northbound T	*	DNS	DNS	DNS	DNS
Northbound R	S				
Southbound L	250	3	5	3	5
Southbound T	*	DNS	DNS	DNS	DNS
Southbound R	S				
Grantland /San Ramon					
Eastbound R	*	5	3	5	3
Westbound R	DNE	25	10	8	3
Northbound L	155	10	8	5	5
Northbound T	*	DNS	DNS	DNS	DNS
Northbound R	DNE				
Southbound L	DNE	3	10	0	3
Southbound T (2)	575	DNS	DNS	DNS	DNS
Southbound R	S				
Grantland / San Jose					
Eastbound LTR	120	23	20	20	15
Westbound LTR	Private	0	3	0	0
Northbound L	105	0	3	0	3
Northbound T	*	DNS	DNS	DNS	DNS
Northbound R	S				
Southbound L	180	3	8	3	5
Southbound T	*	DNS	DNS	DNS	DNS
Southbound R	S				

L: Left-turn lane T: Through lane R: Right-turn lane S: Shared
DNS: Does not stop
* Storage length exceeds 1,000 feet to the next major intersection.
\+ Connects to a two-way left-turn lane or through lane that provides additional storage.

Table 13 (Continued)
Intersection Queuing Summary – 2040 Scenarios

Intersection	Existing Storage Length (feet)	95th-Percentile Queue Length (feet)			
Approach Lane		2040 No Project		2040 With Project	
		A.M.	P.M.	A.M.	P.M.
Grantland / Shaw					
Eastbound L	305 (250)	135	178	122	165
Eastbound T	*	453	294	441	297
Eastbound R	S				
Westbound L	305 (260)	75	94	75	94
Westbound T	*	451	661	436	630
Westbound R	S				
Northbound L	150 (230)	46	32	46	32
Northbound T	*	216	278	209	215
Northbound R	S				
Southbound L	150 (270)	**310**	272	**275**	261
Southbound T	*	184	164	165	152
Southbound R	S (130)	37	35	37	32
Polk / Shaw					
Eastbound L	195	59	62	59	62
Eastbound T (2)	*	503	401	493	388
Eastbound R	110	0	6	0	6
Westbound L	160+	407	**562**	407	**562**
Westbound T	460	**705**	**1,132**	**705**	**1,097**
Westbound R	125+	19	121	19	119
Northbound L	105	77	78	77	78
Northbound T	*	542	416	529	416
Northbound R	S				
Southbound L	120	**378**	**306**	**378**	**306**
Southbound T	*	53	130	52	130
Southbound R	S				

L: Left-turn lane T: Through lane R: Right-turn lane S: Shared
DNS: Does not stop
* Storage length exceeds 1,000 feet to the next major intersection.
Values in parentheses indicate storage lengths currently indicated on design plans for approved projects.

19.0 CRASH HISTORY

Crash records were obtained from the Statewide Integrated Traffic Records System (SWITRS) for the years 2014 through 2018. Table 14 summarizes general crash information at the study intersections. It should be noted that the intersection control at the intersection of Grantland and Shaw Avenues was changed from all-way stop to signals in mid-2017.

Table 14
Crash Records Summary

Intersection	Date of Collision	Primary Factor	Type
Grantland / Bullard	10/17/2015	Alcohol / Drug	Broadside
	08/24/2018	ROW Auto	Broadside
Grantland / Barstow	02/12/2015	Stop Sign / Signal	Broadside
Grantland / San Ramon	No records found		
Grantland / San Jose	No records found		
Grantland / Shaw	01/30/2014	Stop Sign / Signal	Broadside
	11/11/2015	Stop Sign / Signal	Broadside
	03/25/2016	Stop Sign / Signal	Broadside
	10/25/2017	Stop Sign / Signal	Broadside
	12/27/2017	ROW Auto	Broadside
Polk / Shaw	01/02/2014	Too Close	Rear End
	06/10/2014	Improper Turn	Sideswipe
	06/28/2015	Alcohol / Drug	Broadside

20.0 DISCUSSION

20.1 Existing Conditions

The results of the intersection analyses indicate that the intersection of Grantland and Bullard Avenues currently operates below the target LOS during the a.m. peak hour with peak-hour warrants satisfied. The intersection operates at acceptable LOS during the p.m. peak hour. All of the other study intersections are operating at acceptable LOS. Queues exceeding the storage capacity occur at the following intersections:

- Grantland Avenue / Shaw Avenue: southbound left-turn lane during the a.m. peak hour;
- Polk Avenue / Shaw Avenue: southbound left-turn lane during the a.m. and p.m. peak hours.

20.2 Existing-Plus-Project Conditions

The existing-plus-Project conditions analyses represent conditions that would occur after construction and occupancy of the entire Project in the absence of other pending projects and regional growth. This scenario isolates the specific impacts of the Project.

With the exception of the intersection of Grantland and Bullard Avenues, the study intersections are expected to continue to operate at acceptable LOS with queuing conditions similar to the existing conditions.

The Project is expected to cause the LOS to drop from D to E during the p.m. peak hour at the intersection of Grantland and Bullard Avenues, although peak-hour traffic signal warrants are not expected to be satisfied during the p.m. peak hour. The Project is also expected to exacerbate delays by 5.0 seconds at the intersection of during the a.m. peak hour, when peak-

hour traffic signal warrants are already satisfied. These are considered significant impacts during both the a.m. and p.m. peak hours.

To operate at acceptable LOS in the existing-plus-Project conditions, the intersection of Grantland and Bullard Avenues will require signalization. The intersection is included in the City of Fresno TSMI fee program and the City of Fresno has initiated the construction phase of a capital improvement project to install traffic signals at the intersection. The mitigated conditions are summarized in Tables 15 and 16. The mitigated intersection analysis sheets are included in Appendix G.

19.3 Near-Term With-Project Conditions

The near-term with-Project conditions analyses represent conditions that are expected to occur after construction and occupancy of the Project plus construction of the cumulative projects. This scenario estimates the near-term cumulative impacts.

At the intersection of Grantland and Barstow Avenues, the cumulative near-term projects and the proposed Project are expected cause the LOS to drop to E during the a.m. peak hour and F during the p.m. peak hour. Peak-hour traffic signal warrants are only expected to be satisfied during the p.m. peak hour. To operate at acceptable LOS, the intersection will require signalization, including the addition of left-turn lanes on the eastbound and westbound approaches to accommodate eight-phase operations. The intersection is included in the City of Fresno TSMI fee program. The mitigated conditions are summarized in Tables 17 and 18. The mitigated intersection analysis sheets are included in Appendix G.

At the intersection of Polk and Shaw Avenues, the cumulative near-term projects and the proposed Project are expected cause the LOS to drop to F during both peak hours. In order to operate at acceptable LOS, the intersection would require widening to add a second left-turn lane and a second through lane on the westbound approach and a dedicated right-turn lane on the northbound approach while maintaining the number of all other existing lanes. An overlapping right-turn phase is recommended for the right-turn lane on the northbound approach. The mitigated conditions are summarized in Tables 17 and 18. The mitigated intersection analysis sheets are included in Appendix G. Existing buildings and businesses are within the limits of the widening that would be required in the cumulative condition. The City of Fresno has been aware of the congestion anticipated at the intersection and has initiated feasibility studies including the adjacent interchange that will consider potential improvements to improve traffic operations at the intersection. The Project alone does not cause the LOS to drop below D. City of Fresno General Plan Policies MT-1-n and MT-1-o, as well as current State CEQA law, would allow the City to accept the anticipated LOS F. Payment of the City of Fresno TSMI fee is recommended as a provision commensurate with the level of impact to sufficiently improve the overall transportation system.

The intersection of Grantland and Bullard Avenues, the intersection of Grantland and Shaw Avenues, and the site access intersections are expected to continue to operate at acceptable LOS.

19.4 Cumulative 2040 No-Project Conditions

The year 2040 no-Project conditions analyses are based on the assumption that the Project site is developed in accordance with land uses designated in the current City of Fresno

General Plan. The following intersections are expected to operate below the target LOS by the year 2040:

- Grantland Avenue / Barstow Avenue: LOS F during both peak hours;
- Polk Avenue / Shaw Avenue: LOS F during both peak hours.

The calculated 95th-percentile queues exceed the storage capacity at the following locations:

- Grantland Avenue / Shaw Avenue: southbound left-turn lane during the a.m. peak hour;
- Polk Avenue / Shaw Avenue: westbound left-turn lane during the p.m. peak hour, westbound through lane during both peak hours, and southbound left-turn lane during both peak hours.

19.5 Cumulative 2040 With-Project Conditions

The year 2040 With-Project conditions analyses are based on the assumption that the Project site is developed with the proposed Project and regional growth has occurred in accordance with the City of Fresno General Plan. This scenario estimates the long-term cumulative impacts.

It should be noted that there are two key factors that are expected to improve traffic operations at the study intersections in this scenario as opposed to the near-term scenario and the year 2040 no-Project conditions. The construction of the Veterans Boulevard interchange and completion of Veterans Boulevard between State Route 99 and Grantland Avenue is expected to reduce traffic volumes at several study intersections. Furthermore, the proposed Project is expected to generate fewer trips than would occur at the site in the no-Project scenario considering the current land use designations.

At the intersection of Grantland and Barstow Avenues, the cumulative regional growth and the proposed Project are expected cause the LOS to drop to F during the a.m. and p.m. peak hours. Peak-hour traffic signal warrants are only expected to be satisfied during the p.m. peak hour. To operate at acceptable LOS, the intersection will require signalization, including the addition of left-turn lanes on the eastbound and westbound approaches to accommodate eight-phase operations. The intersection is included in the City of Fresno TSMI fee program. The mitigated conditions are summarized in Tables 19 and 20. The mitigated intersection analysis sheets are included in Appendix G.

At the intersection of Polk and Shaw Avenues, the cumulative regional growth and the proposed Project are expected cause the LOS to drop to F during both peak hours. In order to operate at acceptable LOS, the intersection would require widening to add a second left-turn lane and a second through lane on the westbound approach and a dedicated right-turn lane on the northbound approach while maintaining the number of all other existing lanes. An overlapping right-turn phase is recommended for the right-turn lane on the northbound approach. The mitigated conditions are summarized in Tables 19 and 20. The mitigated intersection analysis sheets are included in Appendix G. Existing buildings and businesses are within the limits of the widening that will be required in the future. The City of Fresno has been aware of the future congestion anticipated at the intersection and has initiated feasibility studies including the adjacent interchange that will consider potential improvements to improve traffic operations at the intersection. City of Fresno General Plan

Policies MT-1-n and MT-1-o, as well as current State CEQA law, would allow the City to accept the anticipated LOS F. Payment of the City of Fresno TSMI fee is recommended as a provision commensurate with the level of impact to sufficiently improve the overall transportation system.

The intersection of Grantland and Bullard Avenues, the intersection of Grantland and Shaw Avenues, and the site access intersections are expected to continue to operate at acceptable LOS.

19.6 Summary of Mitigated Conditions

The results of the analyses of mitigated conditions are presented in Tables 15 through 20. The mitigated intersection analysis sheets are attached. Turn lanes should be designed to accommodate the queues presented in the tables.

Table 15
Mitigated Intersection LOS Summary – Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Grantland /Bullard	Signals	17.2	B	13.9	B

Table 16
Mitigated Intersection Queuing Summary – Existing-Plus-Project Conditions

Intersection	95th-Percentile Queue Length (feet)	
Approach Lane	A.M.	P.M.
Grantland / Bullard		
Eastbound L	29	22
Eastbound TR	12	11
Westbound L	13	17
Westbound T	12	11
Westbound R	47	5
Northbound L	12	16
Northbound T (2)	138	104
Northbound R	0	0
Southbound L	87	88
Southbound TR	197	275

L: Left-turn lane T: Through lane R: Right-turn lane

Table 17
Mitigated Intersection LOS Summary – Near-Term With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Grantland /Barstow	Signals	15.5	B	15.4	B
Polk / Shaw	Signals	37.9	D	34.1	C

Table 18
Mitigated Intersection Queuing Summary – Near-Term With-Project Conditions

Intersection	95th-Percentile Queue Length (feet)	
Approach Lane	A.M.	P.M.
Grantland / Barstow		
Eastbound L	30	27
Eastbound TR	35	29
Westbound L	59	64
Westbound TR	35	29
Northbound L	23	35
Northbound TR	293	219
Southbound L	41	51
Southbound TR	172	235
Polk / Shaw		
Eastbound L	60	56
Eastbound T (2)	427	313
Eastbound R	0	0
Westbound L (2)	121	231
Westbound T (2)	194	317
Westbound R	28	52
Northbound L	70	56
Northbound T	79	76
Northbound R	558	267
Southbound L	346	255
Southbound TR	60	104

L: Left-turn lane T: Through lane R: Right-turn lane

Table 19
Mitigated Intersection LOS Summary – 2040 With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Grantland / Barstow	Signals	16.8	B	16.9	B
Polk / Shaw	Signals	37.6	D	32.3	C

Table 20
Mitigated Intersection Queuing Summary – 2040 With-Project Conditions

Intersection	95th-Percentile Queue Length (feet)	
Approach Lane	A.M.	P.M.
Grantland / Barstow		
Eastbound L	30	25
Eastbound TR	71	38
Westbound L	82	93
Westbound TR	38	62
Northbound L	25	35
Northbound TR	346	213
Southbound L	44	52
Southbound TR	163	212
Polk / Shaw		
Eastbound L	58	61
Eastbound T (2)	405	320
Eastbound R	0	0
Westbound L (2)	136	217
Westbound T (2)	202	344
Westbound R	19	57
Northbound L	77	78
Northbound T	74	87
Northbound R	583	321
Southbound L	332	223
Southbound TR	62	129

L: Left-turn lane T: Through lane R: Right-turn lane

21.0 CONCLUSIONS AND RECOMMENDATIONS

Generally-accepted traffic engineering principles and methods were employed to estimate the number of trips expected to be generated by the Project, to analyze the existing traffic conditions, and to analyze the traffic conditions projected to occur in the future.

The trip generation analyses indicate that the Project, including a General Plan amendment, will result in substantially fewer trips and vehicle miles travelled than would be expected under the current land use designation.

The traffic impact study found that the intersection of Grantland and Bullard Avenues currently operates below the target LOS during the a.m. peak hour with peak-hour warrants satisfied. The other study intersections are operating at acceptable LOS. Queues exceeding the storage capacity occur at the following intersections:

- Grantland Avenue / Shaw Avenue: southbound left-turn lane during the a.m. peak hour;
- Polk Avenue / Shaw Avenue: southbound left-turn lane during the a.m. and p.m. peak hours.

With construction and occupancy of the Project, the study intersections are expected to continue to operate at levels of service similar to the existing conditions, with similar queuing conditions. The Project is expected to cause LOS impacts at the intersection of

Grantland and Bullard Avenues. To operate at acceptable LOS, the intersection will require signalization. The intersection is included in the City of Fresno TSMI fee program and the City of Fresno has initiated the construction phase of a capital improvement project to install traffic signals at the intersection.

In the near-term conditions, the cumulative near-term projects and the proposed Project are expected cause LOS impacts at the following intersections:

- Grantland Avenue / Barstow Avenue
- Polk Avenue / Shaw Avenue

The intersection of Polk and Shaw Avenues would require widening to operate at acceptable LOS, including a second left-turn lane and a second through lane on the westbound approach and a dedicated right-turn lane on the northbound approach. An overlapping right-turn phase is recommended for the right-turn lane on the northbound approach. Existing buildings and businesses are within the limits of the widening that would be required in the cumulative condition. The City of Fresno has been aware of the congestion anticipated at the intersection and has initiated feasibility studies including the adjacent interchange that will consider potential improvements to improve traffic operations at the intersection. The Project alone does not cause the LOS to drop below D. City of Fresno General Plan Policies MT-1-n and MT-1-o, as well as current State CEQA law, would allow the City to accept the anticipated LOS F. Payment of the City of Fresno TSMI fee is recommended as a provision commensurate with the level of impact to sufficiently improve the overall transportation system.

It should be noted that there are two key factors that are expected to improve traffic operations at the study intersections in year 2040 scenario as opposed to the near-term scenario and the year 2040 no-Project conditions. The construction of the Veterans Boulevard interchange and completion of Veterans Boulevard between State Route 99 and Grantland Avenue is expected to reduce traffic volumes at several study intersections. Furthermore, the proposed Project is expected to generate fewer trips than would occur at the site in the no-Project scenario considering the current land use designations.

In the year 2040 with-Project scenario, the cumulative regional growth and the proposed Project are expected cause LOS impacts at the following intersections:

- Grantland Avenue / Barstow Avenue
- Polk Avenue / Shaw Avenue

Signalization of the Grantland Avenue / Barstow Avenue intersection would mitigate the LOS impact at the intersection, which is included in the City of Fresno TSMI fee program.

The intersection of Polk and Shaw Avenues would require widening to operate at acceptable LOS, including a second left-turn lane and a second through lane on the westbound approach and a dedicated right-turn lane on the northbound approach. An overlapping right-turn phase is recommended for the right-turn lane on the northbound approach. This configuration is the same configuration recommended in the near-term condition. Payment of the City of Fresno TSMI fee is recommended as a provision commensurate with the level of impact to sufficiently improve the overall transportation system.

The proposed map appears to provide adequate circulation throughout the site.

The City of Fresno *Active Transportation Plan* (ATP) dated December 2016 identifies a proposed bikeway system with Class II bike lanes on all of the major streets at the study intersections, with the following exceptions:

- Barstow Avenue east of Grantland Avenue;
- Shaw Avenue west of Grantland Avenue;
- Island Waterpark Drive (Polk Avenue) north of Shaw Avenue.

The ATP also identifies a Class I bike path along Veterans Boulevard and on the south side of Barstow Avenue near the Project site. The Project is not expected to disrupt or impede existing or planned bicycle facilities.

Pedestrian connectivity is not well established in the general vicinity of the site. Sidewalks typically exist only within, and along the frontage of, adjacent residential developments. The Project would be required to construct sidewalks along its frontage. The Project is not expected to disrupt or impede existing or planned pedestrian facilities.

Fresno Area Express (FAX) provides bus service to the Fresno area. FAX Route 12 is the nearest to the Project site, with its nearest point being the intersection Shaw and Hayes Avenues. The Project is not expected to disrupt or impede existing transit facilities.

Thank you for the opportunity to perform this traffic impact study. This traffic impact study was prepared under my supervision and direction. Please feel free to contact our office if you have any questions.

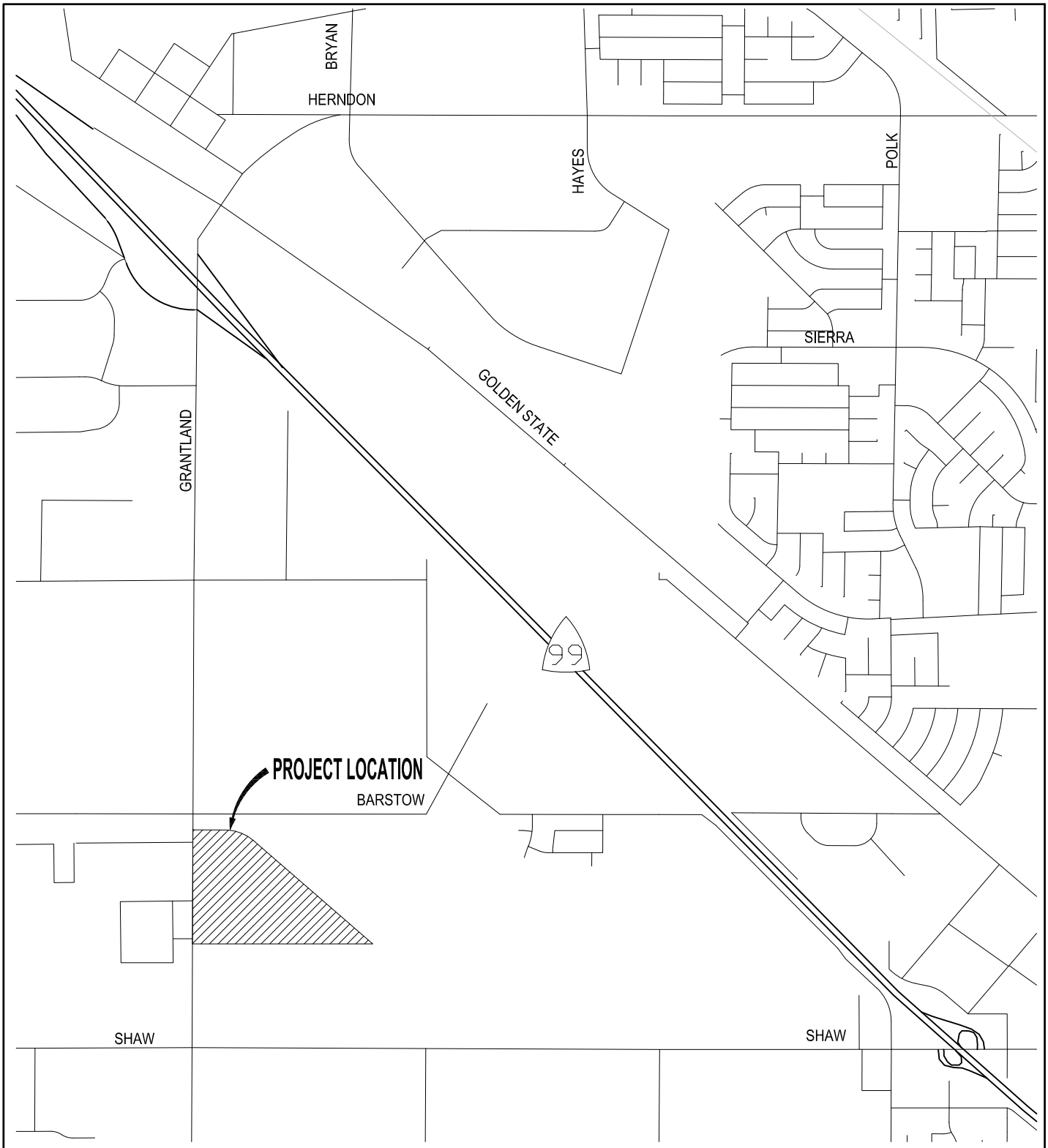
PETERS ENGINEERING GROUP

John Rowland, PE, TE



Attachments: Figures 1 through 13
Appendix A - Scope Request Letter and Responses
Appendix B - Traffic Study Checklist
Appendix C - Traffic Count Data Sheets
Appendix D - Fresno County Travel Model
Appendix E - Cumulative Projects
Appendix F - Intersection Analysis Sheets
Appendix G - Mitigated Intersection Analysis Sheets

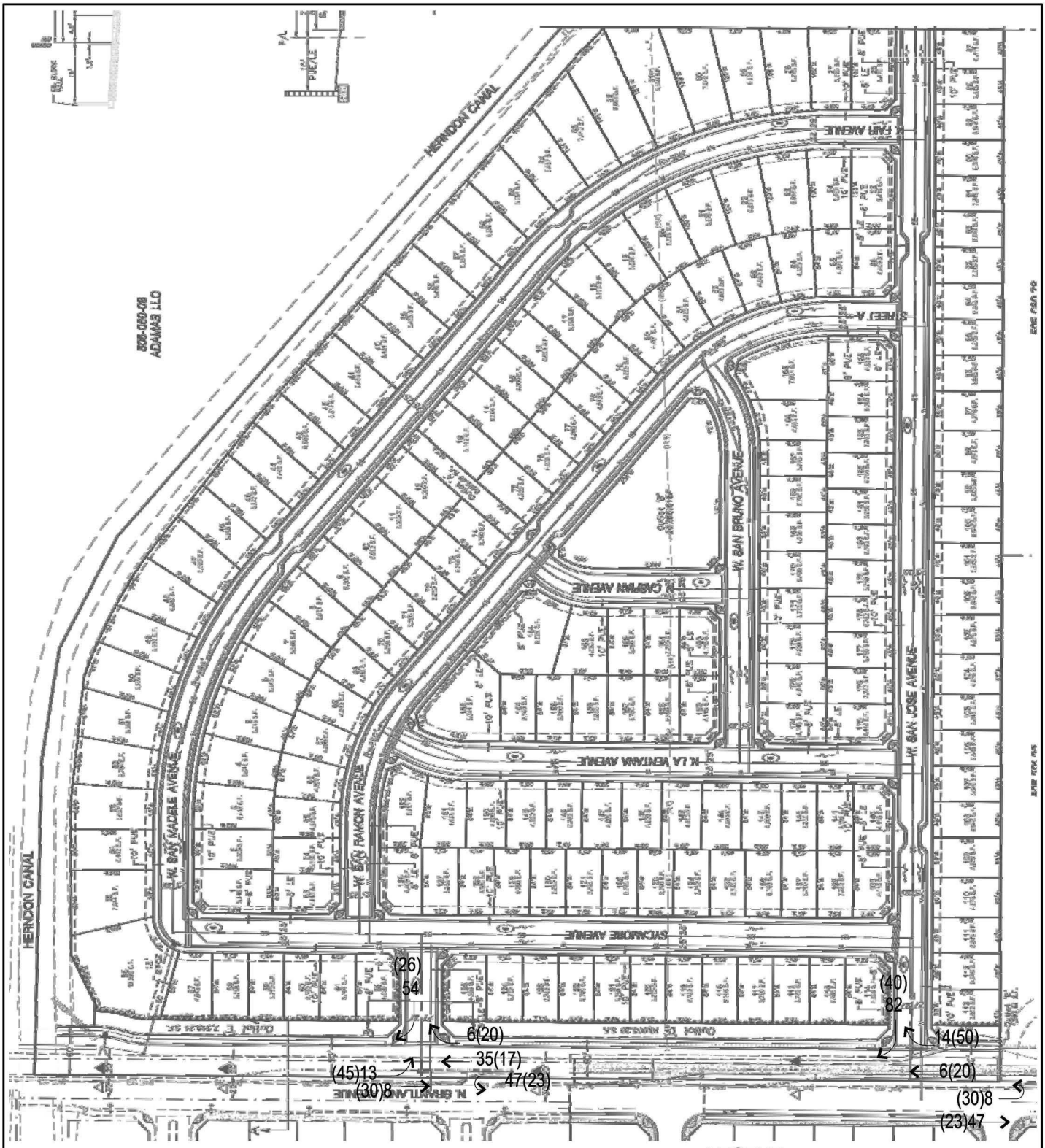
FIGURES



Proposed Tract 6294
Fresno, California

VICINITY MAP

Not to Scale



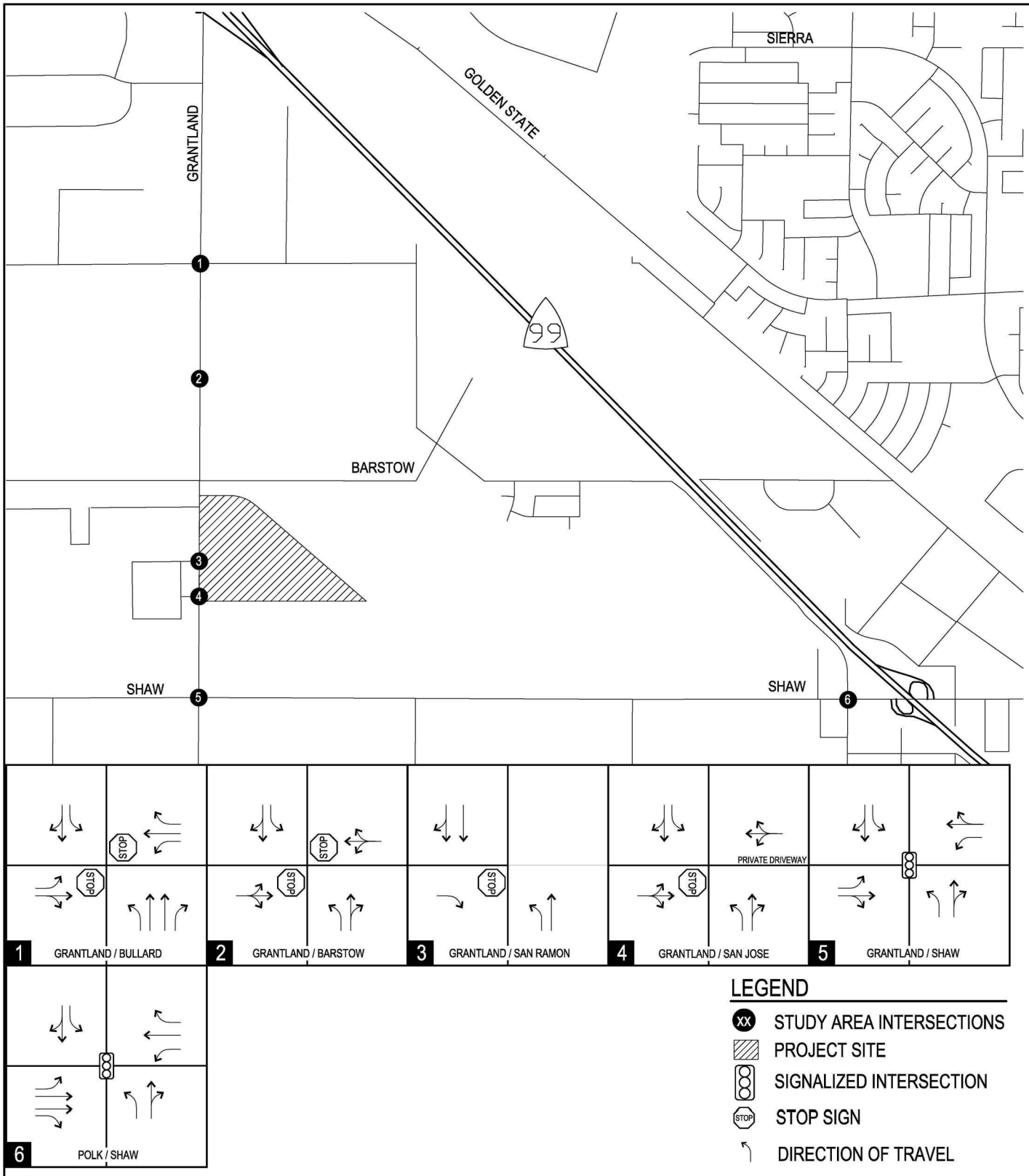
LEGEND

XX (YY) AM (PM) PEAK HOUR VOLUMES

Proposed Tract 6294
Fresno, California

Not to Scale

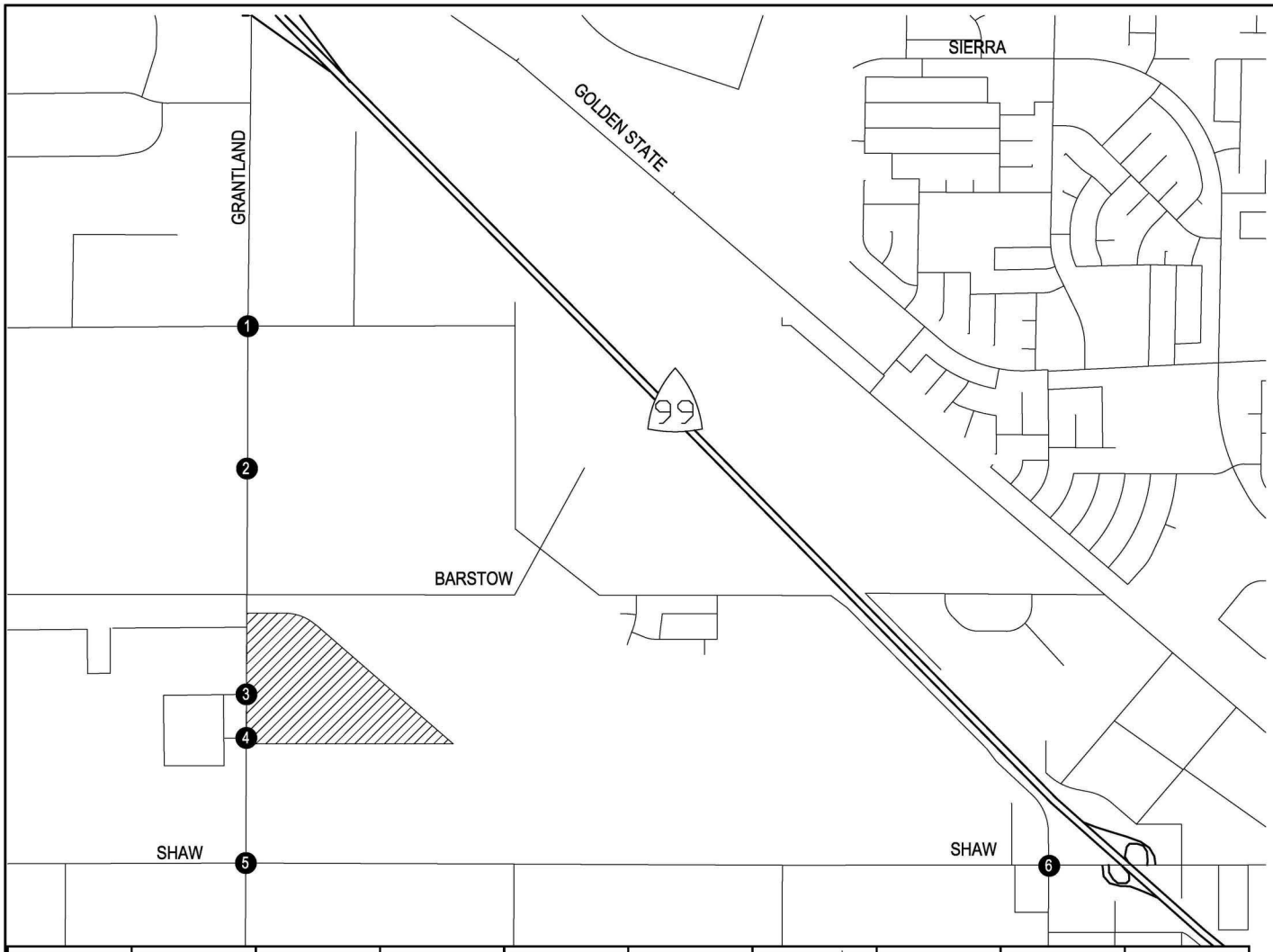
SITE PLAN

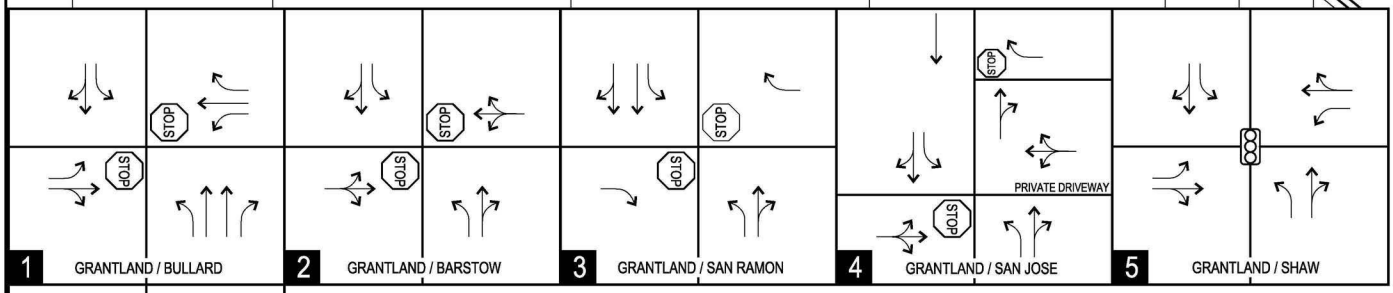


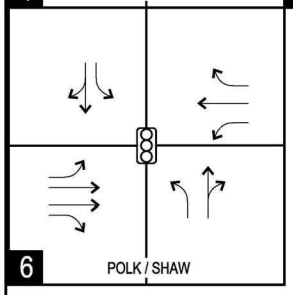
Proposed Tract 6294
Fresno, California

EXISTING LANE CONFIGURATIONS AND INTERSECTION CONTROL

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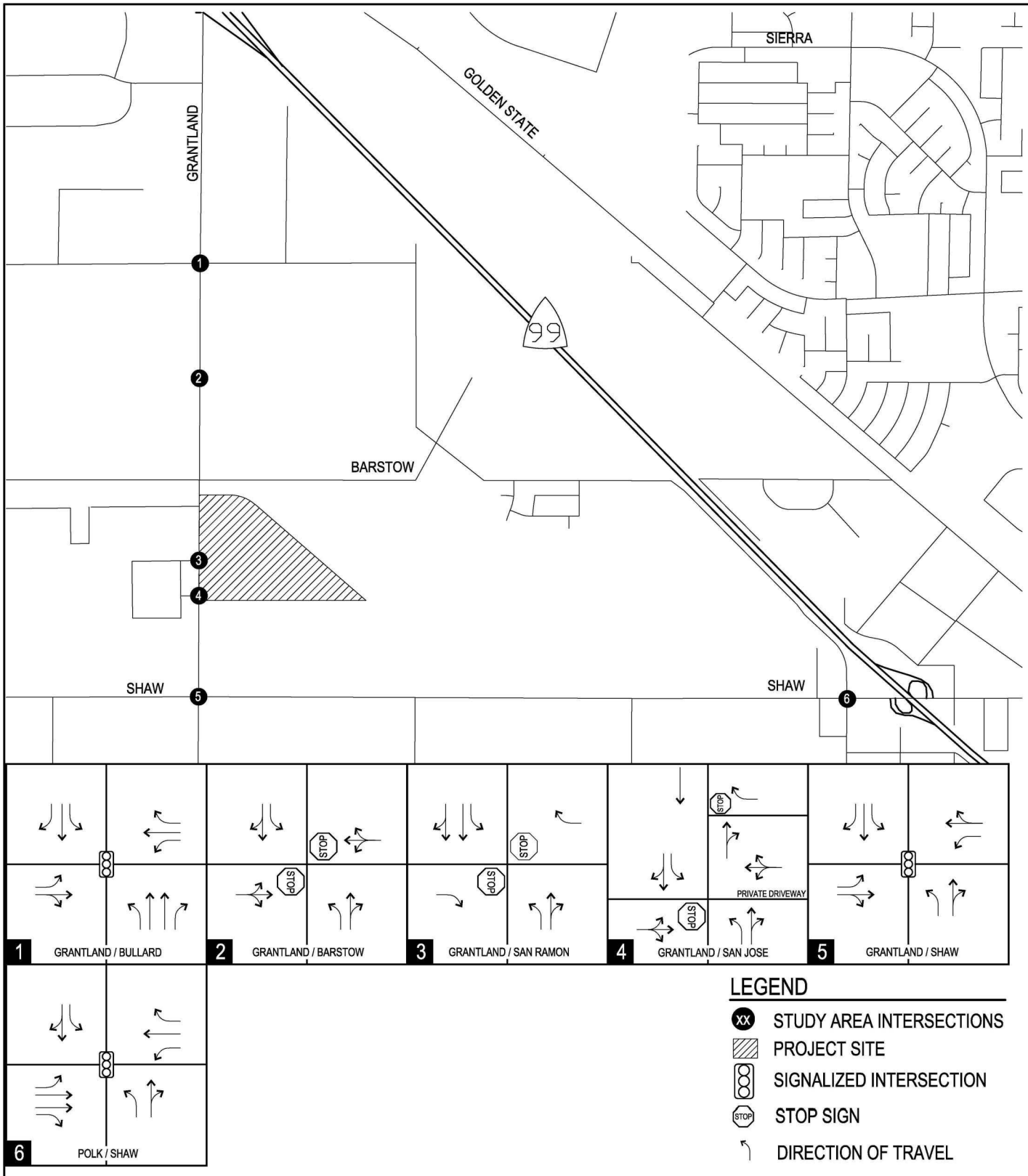
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- XX STUDY AREA INTERSECTIONS
- PROJECT SITE
- SIGNALIZED INTERSECTION
- STOP SIGN
- DIRECTION OF TRAVEL

Proposed Tract 6294
Fresno, California

EXISTING PLUS PROJECT LANE CONFIGURATIONS AND INTERSECTION CONTROL

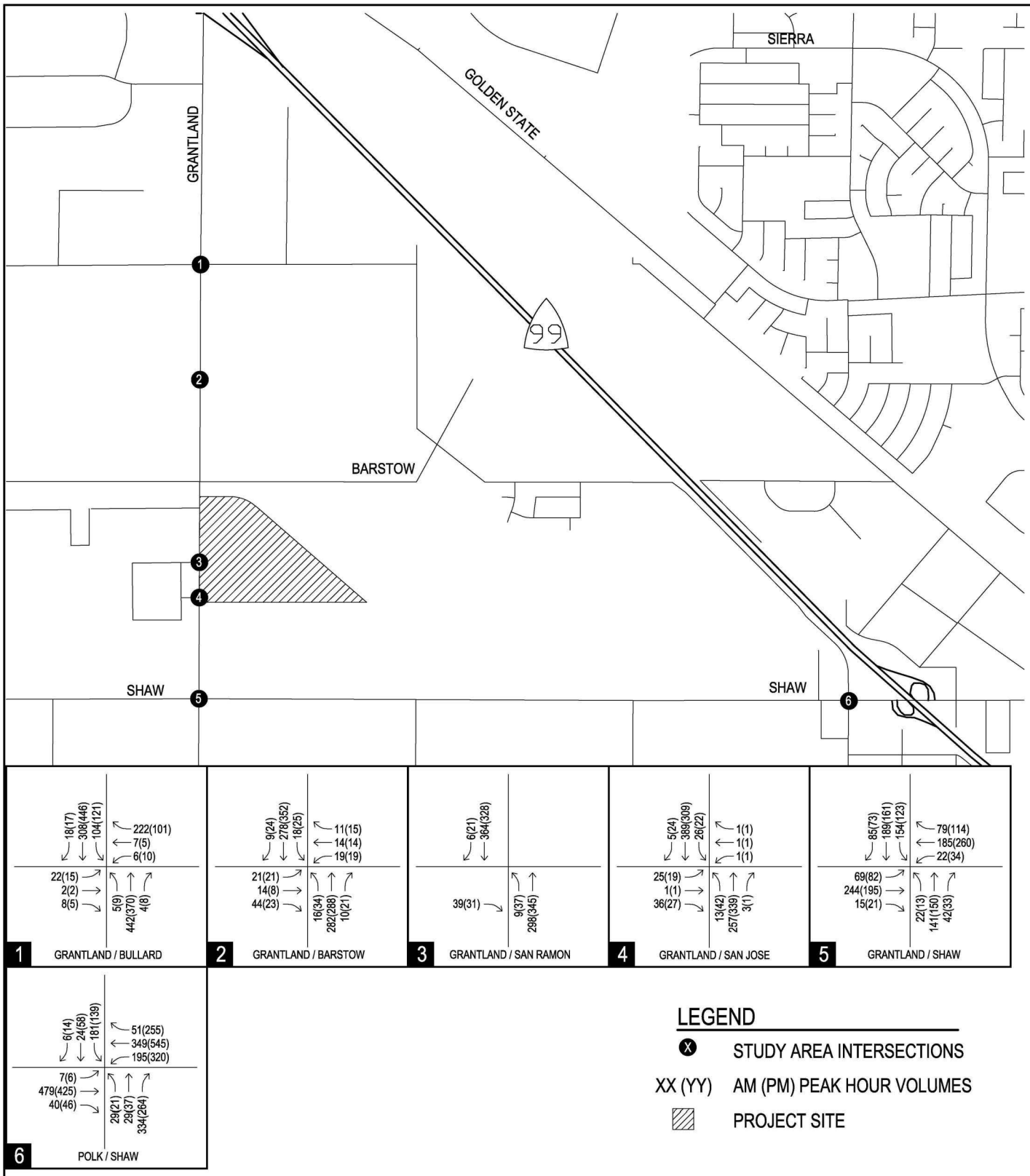
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Proposed Tract 6294
Fresno, California

NEAR-TERM WITH PROJECT
LANE CONFIGURATIONS AND INTERSECTION CONTROL

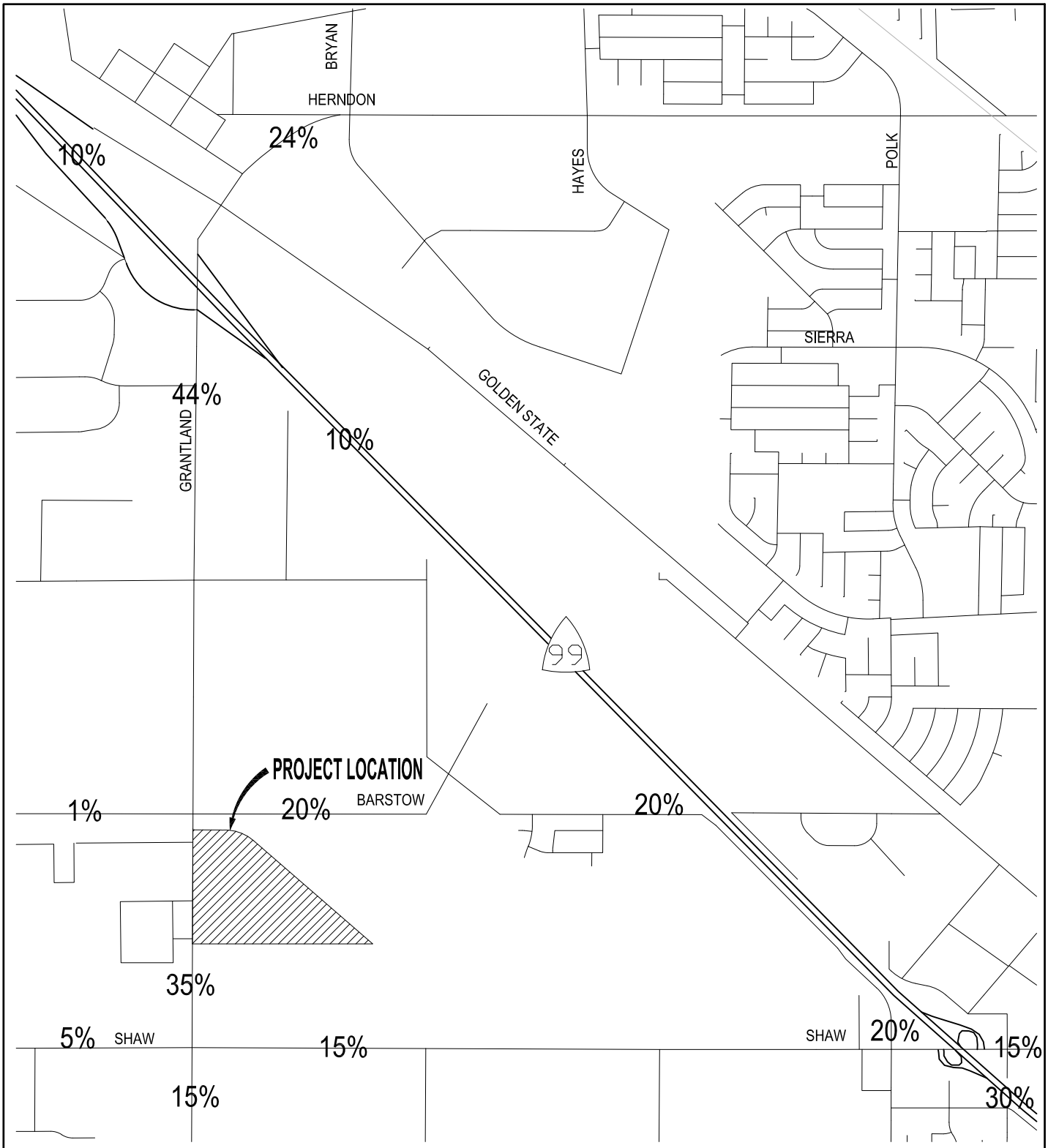
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Proposed Tract 6294
Fresno, California

EXISTING PEAK-HOUR TRAFFIC VOLUMES

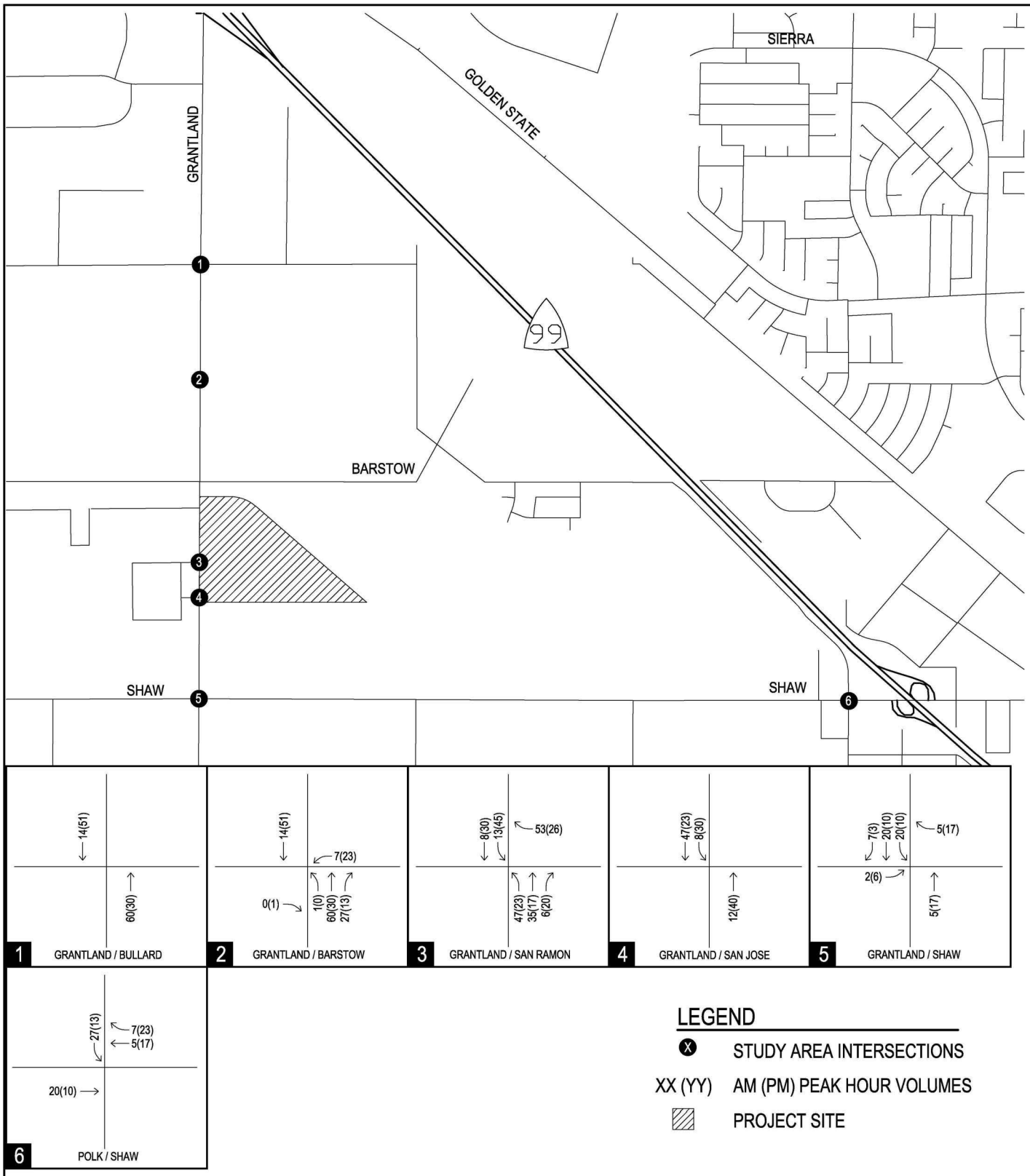
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Proposed Tract 6294
Fresno, California

PROJECT TRIP DISTRIBUTION PERCENTAGES

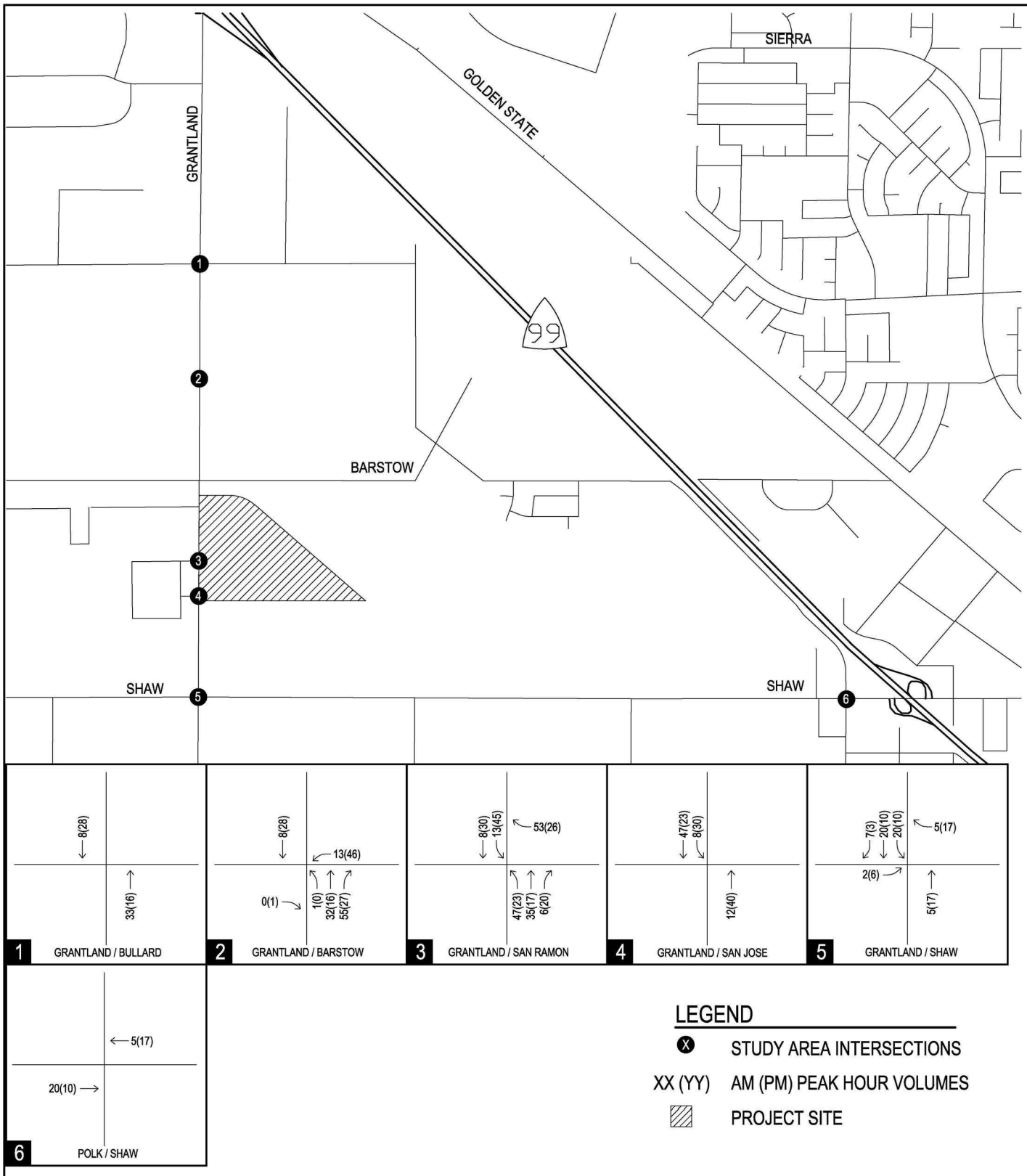
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Proposed Tract 6294
Fresno, California

PEAK-HOUR PROJECT TRAFFIC VOLUMES

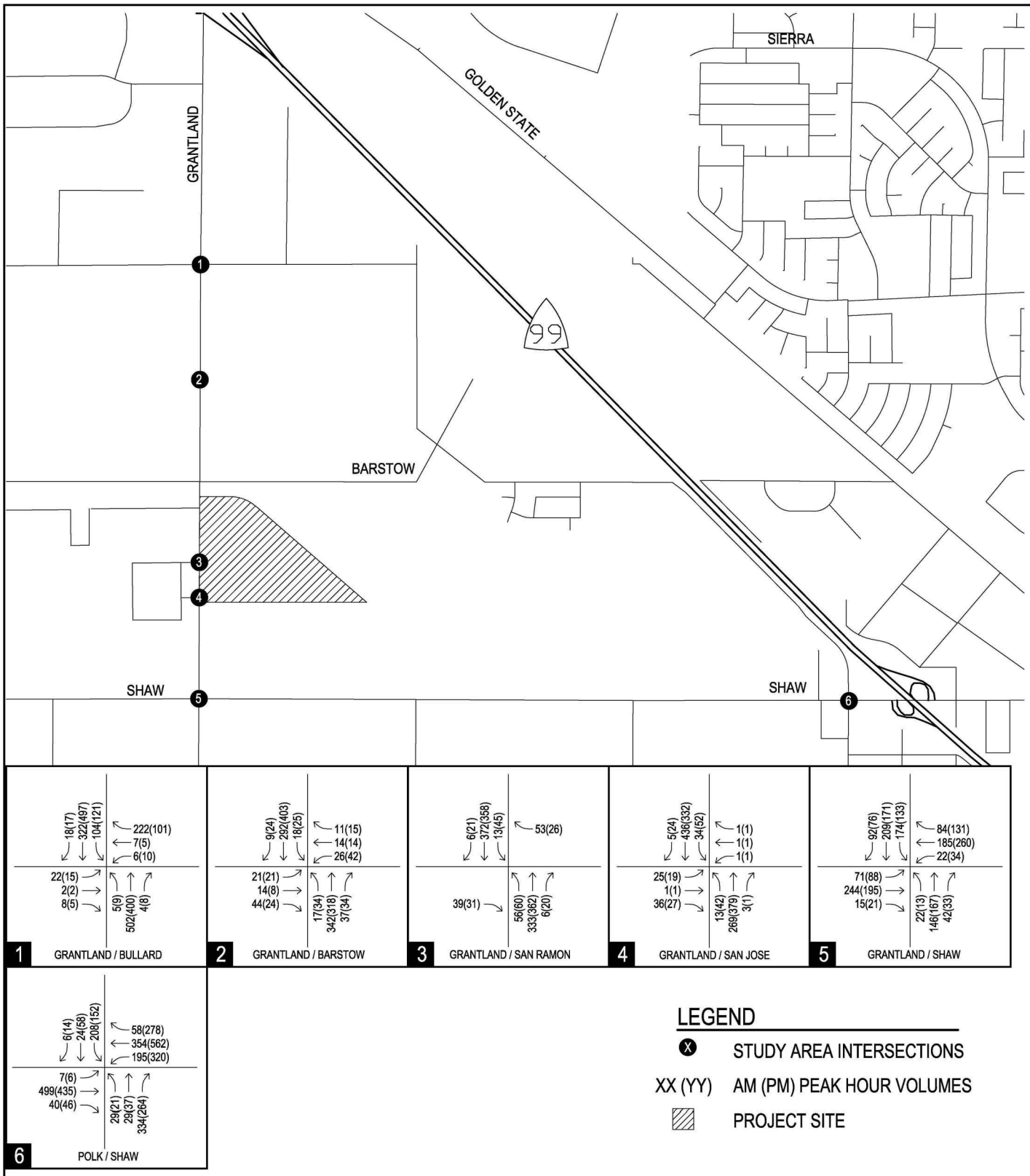
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Proposed Tract 6294
Fresno, California

YEAR 2040 PEAK-HOUR PROJECT TRAFFIC VOLUMES

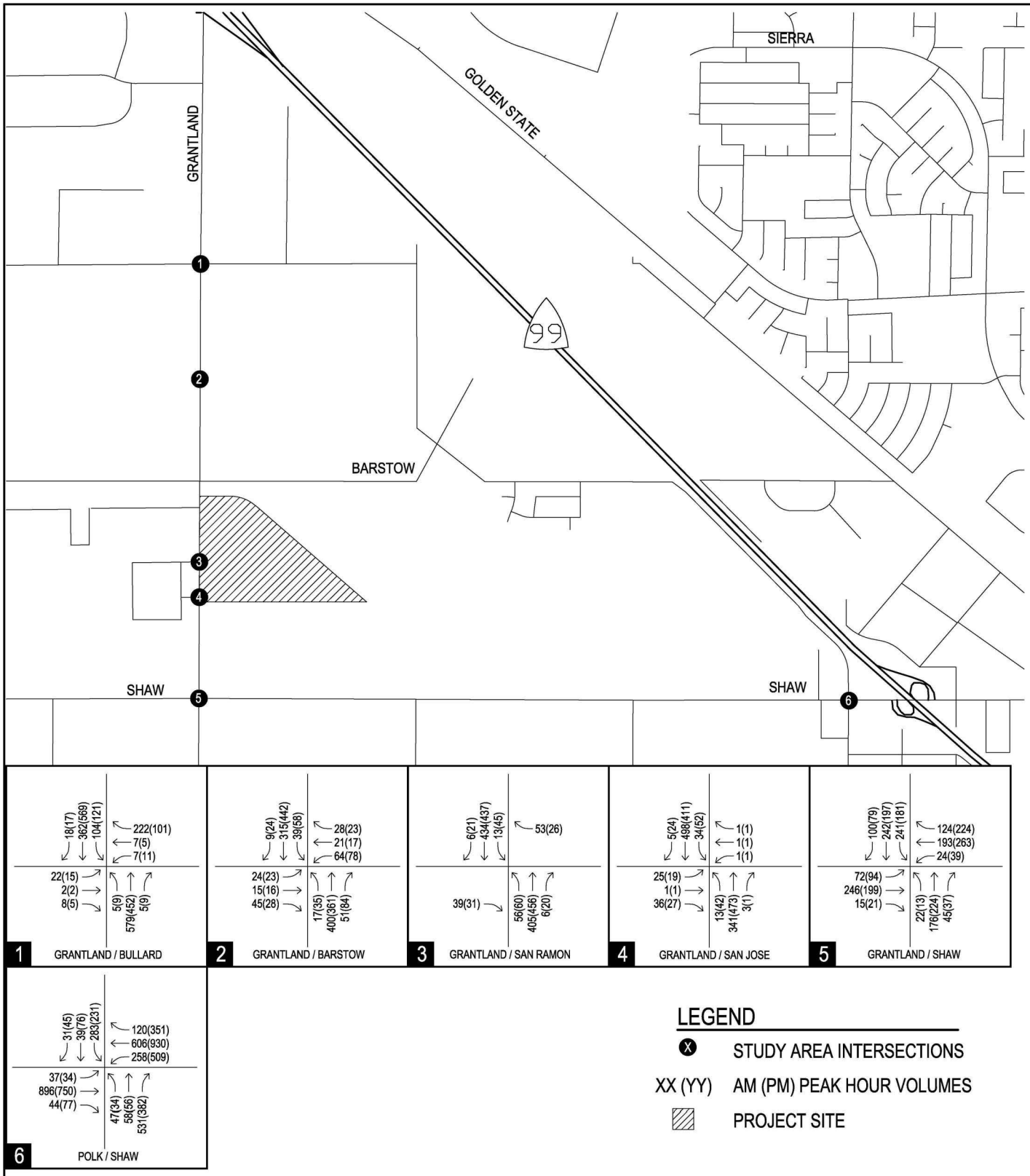
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Proposed Tract 6294
Fresno, California

EXISTING PLUS PROJECT PEAK-HOUR TRAFFIC VOLUMES

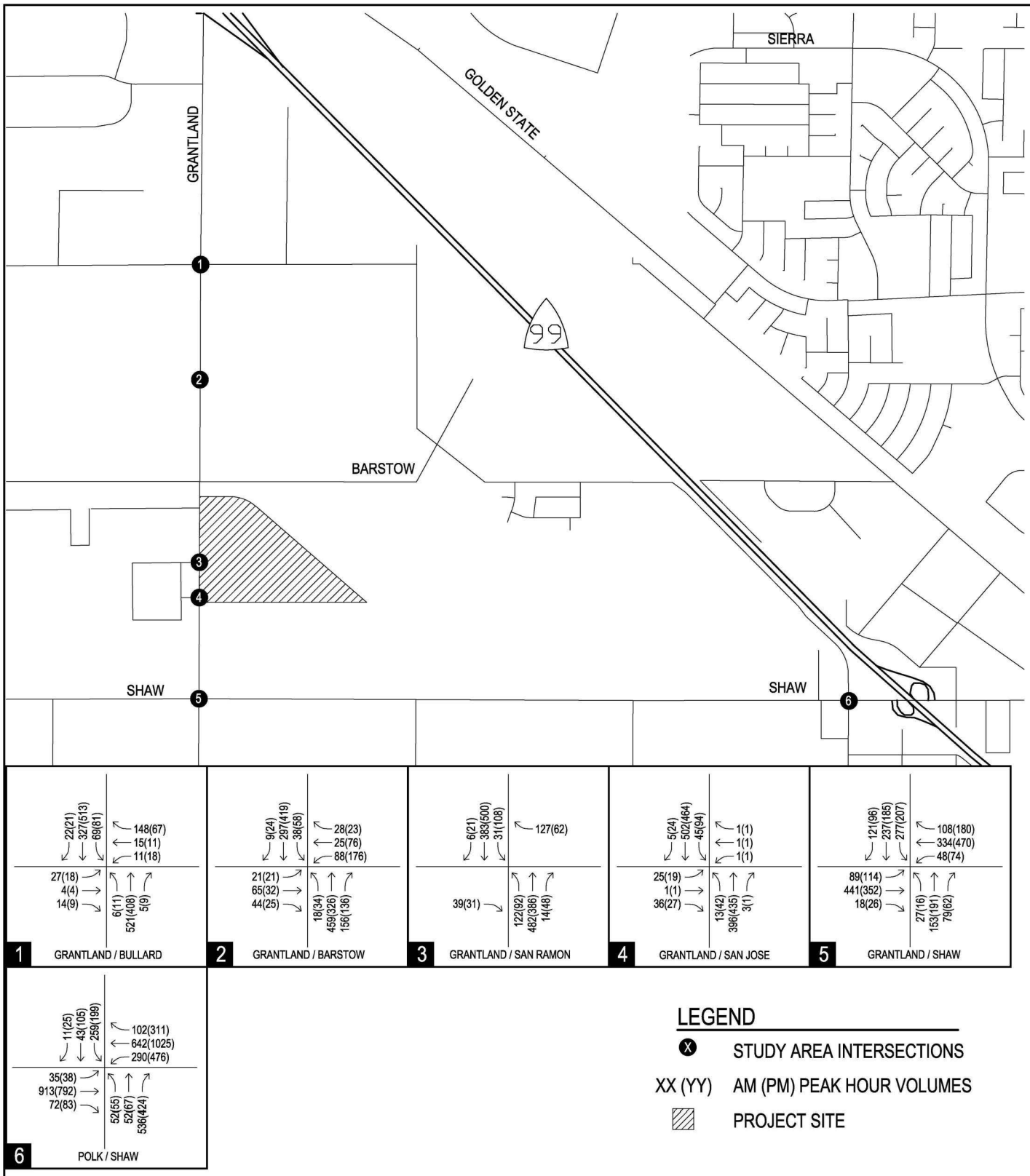
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Proposed Tract 6294
Fresno, California

NEAR-TERM WITH PROJECT PEAK-HOUR TRAFFIC VOLUMES

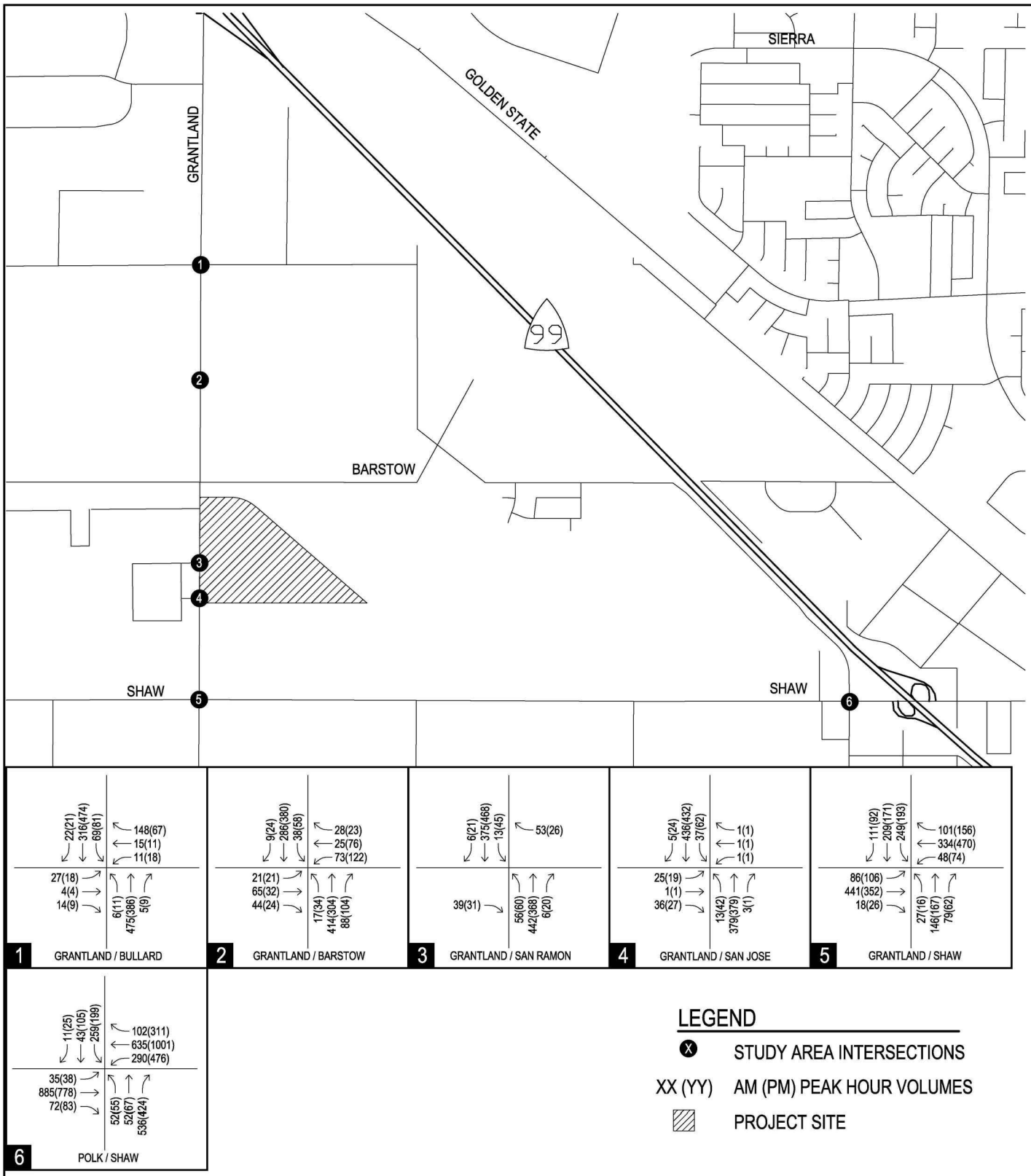
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Proposed Tract 6294
Fresno, California

YEAR 2040 CUMULATIVE NO PROJECT PEAK-HOUR TRAFFIC VOLUMES

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Proposed Tract 6294
Fresno, California

YEAR 2040 CUMULATIVE WITH PROJECT PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

APPENDIX A
SCOPE REQUEST LETTER AND RESPONSES

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

Mr. Harmanjit Dhaliwal, PE
City of Fresno
2600 Fresno Street, 4th Floor
Fresno, California 93721-3623

December 6, 2019

Subject: Scope of Traffic Impact Study
Proposed Tract 6294
Southeast of the Intersection of Grantland and Barstow Avenues
Fresno, California

Dear Mr. Dhaliwal:

Peters Engineering Group has been retained to perform a traffic impact study for the subject project. The purpose of this letter is to provide the City of Fresno and other affected agencies with an opportunity to comment on the scope of the traffic impact study. The traffic impact study will be prepared in conformance with the *City of Fresno Traffic Impact Study Report Guidelines* updated February 2, 2009 and will be submitted with a completed version of the City of Fresno Public Works Department Traffic Study Checklist.

We are requesting that the City provide comments related to the scope of the study to Peters Engineering Group, including approval of the trip generation calculations and determination of the intersections to be studied.

Project Description

The Project site covers approximately 29.84 gross acres and 28.00 net acres located southeast of the intersection of Grantland and Barstow Avenues in Fresno, California. The Project consists of 55 Chateau Homesites (minimum 50-foot by 100-foot lots) and 130 Summer Homesites (minimum 45-foot by 84-foot lots), for a total of 185 single-family residences. A General Plan Amendment (GPA) will be required to change the land use from Regional Mixed Use allowing between 30 and 45 dwelling units per acre to a different land use allowing the proposed density of approximately 6 to 7 dwelling units per acre.

Site access will be via two local streets connecting to Grantland Avenue. The northern street is proposed approximately opposite the existing San Ramon Avenue, with a new left-turn lane proposed to allow left turns into the site from southbound Grantland Avenue. A median worm would prevent left turns from eastbound and westbound San Ramon Avenue to Grantland Avenue.

The southern street is proposed slightly north of the existing San Jose Avenue. There is currently a full median opening with left-turn lanes at San Jose Avenue that would need to be modified to create two different openings with a small median between them. The left-turn lane from southbound Grantland Avenue would be moved to the north. As an alternative, the

proposed southern driveway could be aligned with San Jose Avenue to utilize the existing median opening.

Future connectivity will be provided for approximately 16 single-family residences that would likely require access through the Project site.

A vicinity map is presented in the attached Figure 1, Site Vicinity Map, and a site plan is presented in Figure 2, Site Plan.

Project Trip Generation

Total Vehicle Trips

Data provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*, are typically used to estimate the number of trips anticipated to be generated by proposed projects. Table 1 presents trip generation estimates for the Project.

Table 1
Project Trip Generation Estimate

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	185	9.44	1,748	0.74	25:75	34	103	137	0.99	63:37	116	68	184

Reference: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers 2017
Rates are reported in trips per dwelling unit.

For purposes of the analyses, trips expected to be generated by an additional 16 residences east of the site will be included. Table 2 presents trip generation estimates for a combination of the Project and the site to the east.

Table 2
Combined Trip Generation Estimate

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	201	9.44	1,898	0.74	25:75	37	112	149	0.99	63:37	125	74	199

Reference: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers 2017
Rates are reported in trips per dwelling unit.

The Project includes a GPA. The currently Regional Mixed Use land use allows up to 45 dwelling units per acre. It is estimated that the site could yield as many as approximately 1,215 multi-family units. An estimate of the number of trips that could be generated at the site based on the current Regional Mixed Use zoning with residential development is presented in Table 3.

Table 3
Trip Generation Estimate – Regional Mixed Use (Residential)

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Multifamily Housing (Mid Rise) (221)	1,215	5.44	6,610	0.36	26:74	114	324	438	0.44	61:39	326	209	535

Reference: *Trip Generation Manual, 10th Edition,* Institute of Transportation Engineers 2017
Rates are reported in trips per dwelling unit.

Project Trip Distribution and Assignment

The regional distribution of Project trips can be estimated by performing a select zone analysis using an appropriate travel model. A select zone analysis request with the trip generation information and other relevant Project data have been provided to the Fresno Council of Governments (COG) to perform a Project-specific select zone analysis.

In the absence of a completed select zone analysis, the estimated percentage distribution of Project trips is presented in Figure 3, Project Trip Distribution Percentages. The peak-hour Project traffic volumes presented in Table 1 were assigned to the adjacent road network in accordance with the trip distribution percentages described above. The estimated peak-hour Project traffic volumes are presented in Figure 4, Project Peak-Hour Traffic Volumes.

Study Area

It is anticipated that the traffic impact study would include analysis of the following intersections:

1. Grantland Avenue / Barstow Avenue
2. Grantland Avenue / North Site Access / San Ramon Avenue
3. Grantland Avenue / South Site Access / San Jose Avenue
4. Grantland Avenue / Shaw Avenue

Peters Engineering Group is requesting that the City of Fresno and other affected agencies identify any other intersections that are to be included in the study.

Since intersection operations typically govern with respect to the required number of through lanes on roadway, road segment analyses are not proposed.

Completion of Veterans Boulevard

Peters Engineering Group is requesting that the City provide assumptions relative completion of Veterans Boulevard, including the completion of the Veterans Boulevard interchange, the realignment of Barstow Avenue at Veterans Boulevard, and the extension of Veterans Boulevard to Grantland Avenue. Specifically, should the near-term assumptions be based on the existing roadways and the year 2040 assumptions be based on the General Plan circulation plan?

Study Scenarios

The following time periods will be studied:

- Weekday a.m. peak hour between 7:00 and 9:00 a.m.;
- Weekday p.m. peak hour between 4:00 and 6:00 p.m.

The peak hours will be analyzed for the following conditions:

- Existing Conditions;
- Existing-Plus-Project Conditions;
- Near-Term With Project Conditions;
- Cumulative (Year 2040) No-Project Conditions (assumes site is built out per the current General Plan); and
- Cumulative (Year 2040) Conditions With Project.

Collision analyses and complete traffic signal warrants analyses are not proposed for this study.

Pending Projects

The analyses for the near-term and long-term conditions consider the effects of traffic expected to be generated by pending and approved projects in the study area. Peters Engineering Group is requesting that the City of Fresno provide information related to pending and approved projects in the vicinity of the study intersections to be included in the traffic analysis.

Significance Criteria

Level of Service

The Transportation Research Board *Highway Capacity Manual*, 2010, (HCM2010) defines level of service (LOS) as, "A quantitative stratification of a performance measure or measures that represent quality of service, measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst."

Automobile mode LOS characteristics for both unsignalized and signalized intersections are presented in Tables 4 and 5.

Table 4
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Average Vehicle Delay (seconds)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

Table 5
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Volume-to-capacity ratio is low. Progression is exceptionally favorable or the cycle length is very short.	<10
B	Volume-to-capacity ratio is low. Progression is highly favorable or the cycle length is very short.	>10-20
C	Volume-to-capacity ratio is no greater than 1.0. Progression is favorable or cycle length is moderate.	>20-35
D	Volume-to-capacity ratio is high but no greater than 1.0. Progression is ineffective or cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35-55
E	Volume-to-capacity ratio is high but no greater than 1.0. Progression is unfavorable and cycle length is long. Individual cycle failures are frequent.	>55-80
F	Volume-to-capacity ratio is greater than 1.0. Progression is very poor and cycle length is long. Most cycles fail to clear the queue.	>80

Reference: *Highway Capacity Manual,* Transportation Research Board, 2010

City of Fresno Criteria

The proposed Project site and the study intersections are located in TIZ-III. In TIZ-III, a significant traffic impact typically is identified if:

- the proposed Project will decrease the LOS below D at an intersection; or
- the proposed Project will exacerbate an existing deficiency at an intersection already operating below LOS D by increasing the average delay per vehicle at the intersection by 5.0 seconds or more.

County of Fresno Criteria

The document *Guidelines for the Preparation of Traffic Impact Studies Within County of Fresno* dated August 2012 (County Guidelines) identifies LOS A, B, and C as acceptable at County locations and LOS D, E, and F as unacceptable. LOS D is considered acceptable within the sphere of influence (SOI) of the City of Fresno or the City of Clovis. The County Guidelines state:

A project is considered to have a significant impact if its traffic, when added to the traffic of the without-project condition, would cause any of the changes in traffic conditions described below.

1) On roadway segments:

a) Cause a roadway that is operating at an acceptable LOS to deteriorate to an unacceptable LOS; OR

b) Cause the V/C ratio (on a directional peak hour basis) to increase by more than 0.05 on a roadway that is already operating at an unacceptable LOS. It should be noted that a decrease from an unacceptable LOS to a lesser LOS (e.g. from LOS D to LOS E in

County areas) is not considered an impact unless the corresponding V/C ratio increase is greater than 0.05.

2) *At signalized intersections:*

   a) *Cause an intersection that is operating at an acceptable LOS to deteriorate to an unacceptable LOS; OR*

   b) *Cause the average delay to increase by more than 5.0 seconds at a signalized intersection that is operating at an unacceptable LOS. It should be noted that a decrease from an unacceptable LOS to a lesser LOS (e.g. from LOS D to LOS E in County areas) is not considered an impact unless the corresponding delay increase is greater than 5.0 seconds.*

3) *At unsignalized intersections, including all-way stop, minor approach stop, and roundabouts:*

   a) *Cause a movement or approach that is operating at an acceptable LOS to deteriorate to an unacceptable LOS; OR*

   b) *Cause the average delay to increase by more than 5.0 seconds on a movement or approach that is operating at an unacceptable LOS. It should be noted that a decrease from an unacceptable LOS to a lesser LOS (e.g. from LOS D to LOS E in County areas) is not considered an impact unless the corresponding delay increase is greater than 5.0 seconds.*

4) *On roadways with traveled way width of less than 18 feet (essentially one-lane roadways assuming a minimum of 8 feet per travel direction for vehicle width and edge-of-traveled-way clearance, plus 2 feet clearance between vehicles traveling in opposite directions.)*

   a) *Cause a roadway that already carries 100 vehicles per day (vpd) or less to carry more than 100 vpd; OR*

   b) *Cause a roadway that already carries more than 100 vpd to carry any additional traffic.*

The County Guidelines also contain the following statement: "*Although queuing is not included as a significance criterion, the TIS shall include a queuing analysis when appropriate, particularly (but not limited to) left-turn pockets at signalized intersections. The TIS shall include recommendations to correct excessive queuing, blocking, operational problems, or storage deficiencies related to queuing.*"

Caltrans Criteria

The Caltrans *Guide for the Preparation of Traffic Impact Studies* dated December 2002 (Caltrans Guide) states the following: "*Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" (see Appendix "C-3") on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained.*"

A significant traffic impact typically is identified at State locations if:

- the proposed Project will decrease the LOS below C at an intersection; or
- the proposed Project will exacerbate an existing deficiency at an intersection already operating below LOS C by increasing the average delay per vehicle at the intersection by 5.0 seconds or more.

Deviations from Traffic Study Checklist

We are requesting that analyses using Synchro 9 software be allowed. In addition, we are requesting that collision analyses and traffic signal warrants analyses (24-hour counts) be excluded from the required scope of work.

Closing

Peters Engineering Group is requesting written comments and/or confirmation of the content of this letter. Specifically, we are requesting discussion and confirmation of the following items discussed above from all affected agencies before continuing with the analyses:

- Trip generation assumptions and calculations
- Study area intersections to be counted and analyzed
- The time periods requiring intersection turning movement counts
- The study scenarios
- Significance criteria
- Pending and approved projects
- Assumptions for completion of Veterans Boulevard and realignment of Barstow Avenue
- 24-hour counts for traffic signal warrants not proposed
- Collision analyses not proposed.

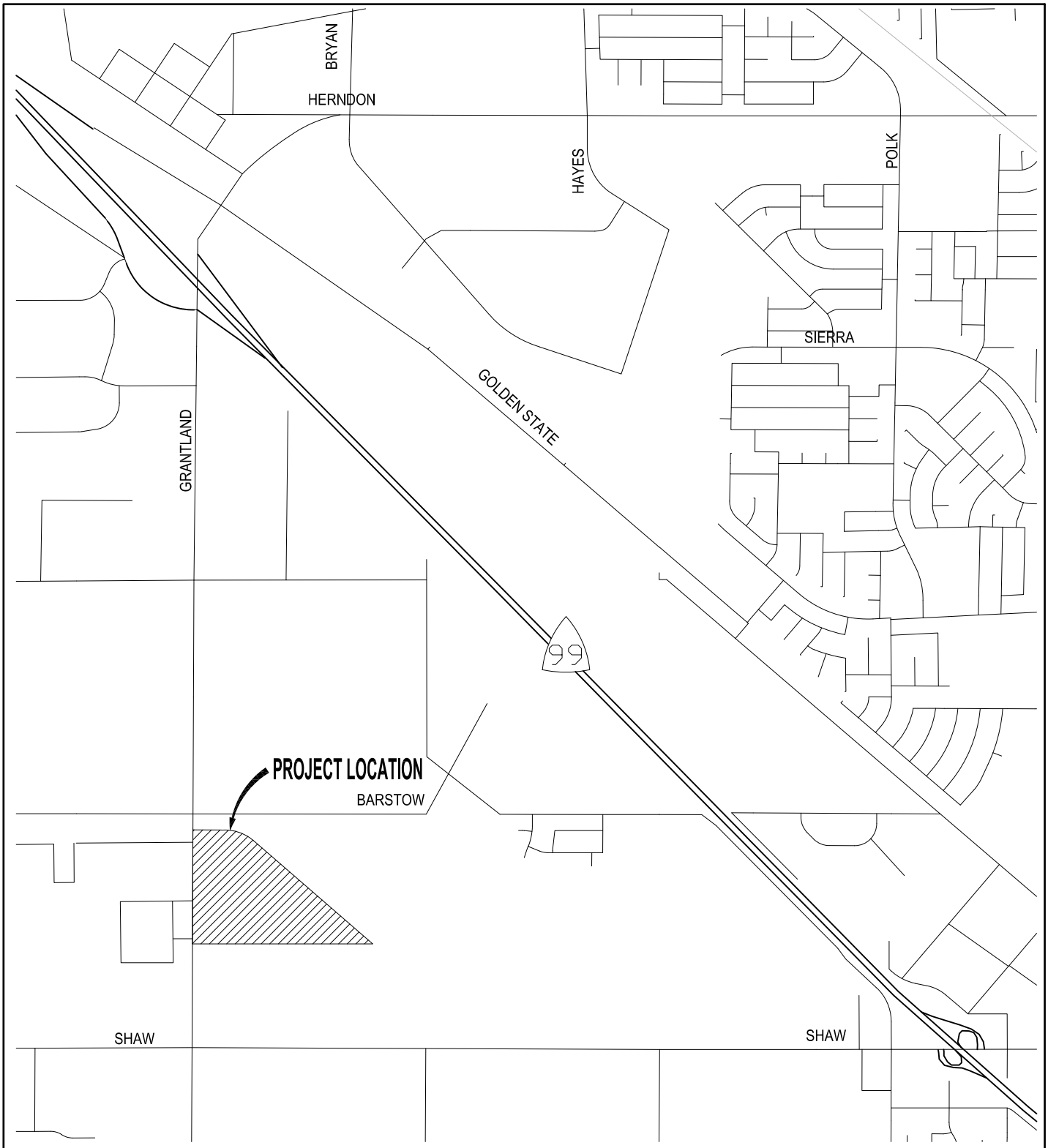
Thank you for the opportunity to work with you on this project. Please feel free to contact our office or email me at jrowland@peters-engineering.com if you have any questions.

PETERS ENGINEERING GROUP

John Rowland, PE, TE

Attachments: Figures 1 through 4

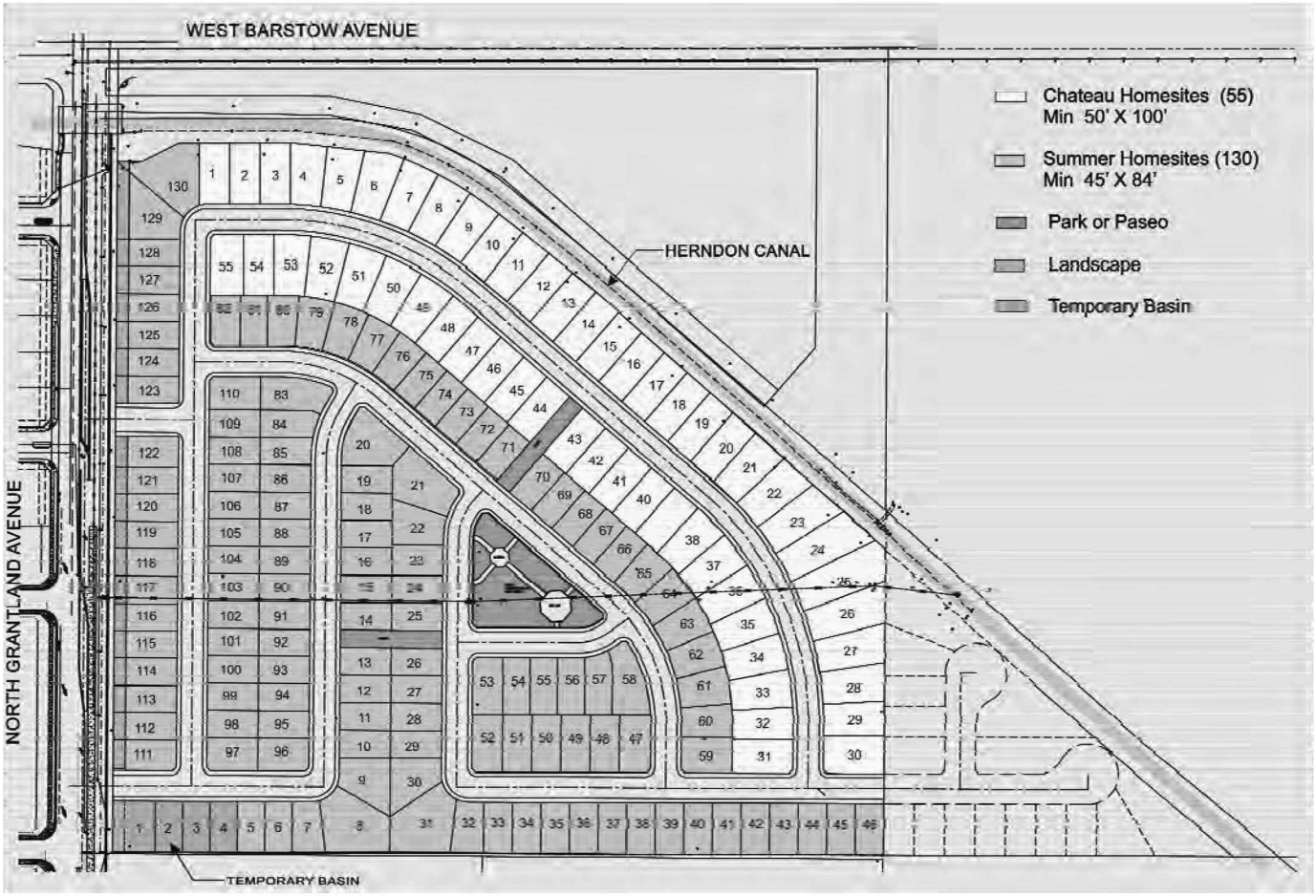
cc: Mr. Brian Spaunhurst, County of Fresno
Mr. David Padilla, Caltrans



Proposed Tract 6294
Fresno, California

VICINITY MAP

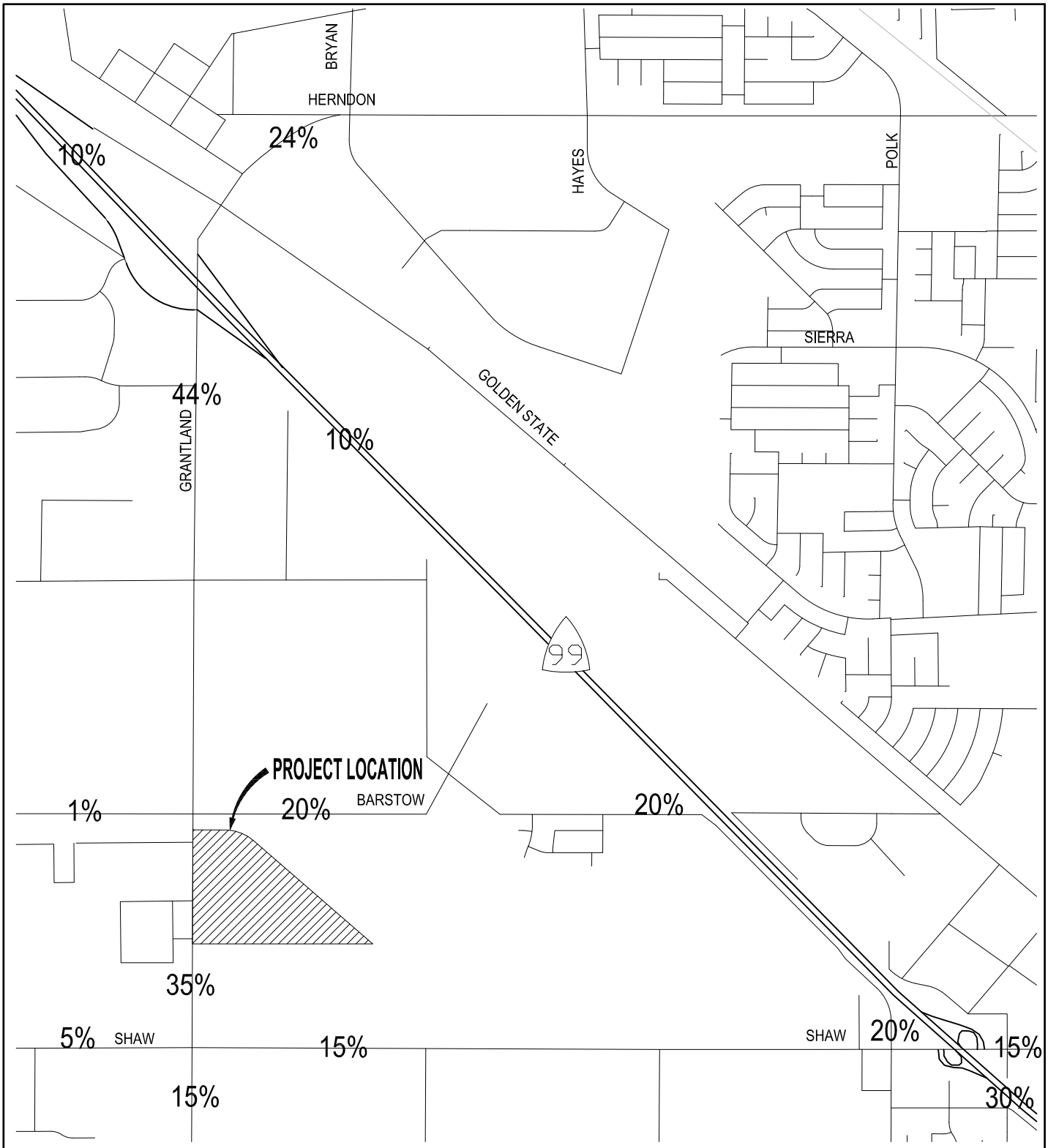
Not to Scale



Proposed Tract 6294
Fresno, California

SITE PLAN

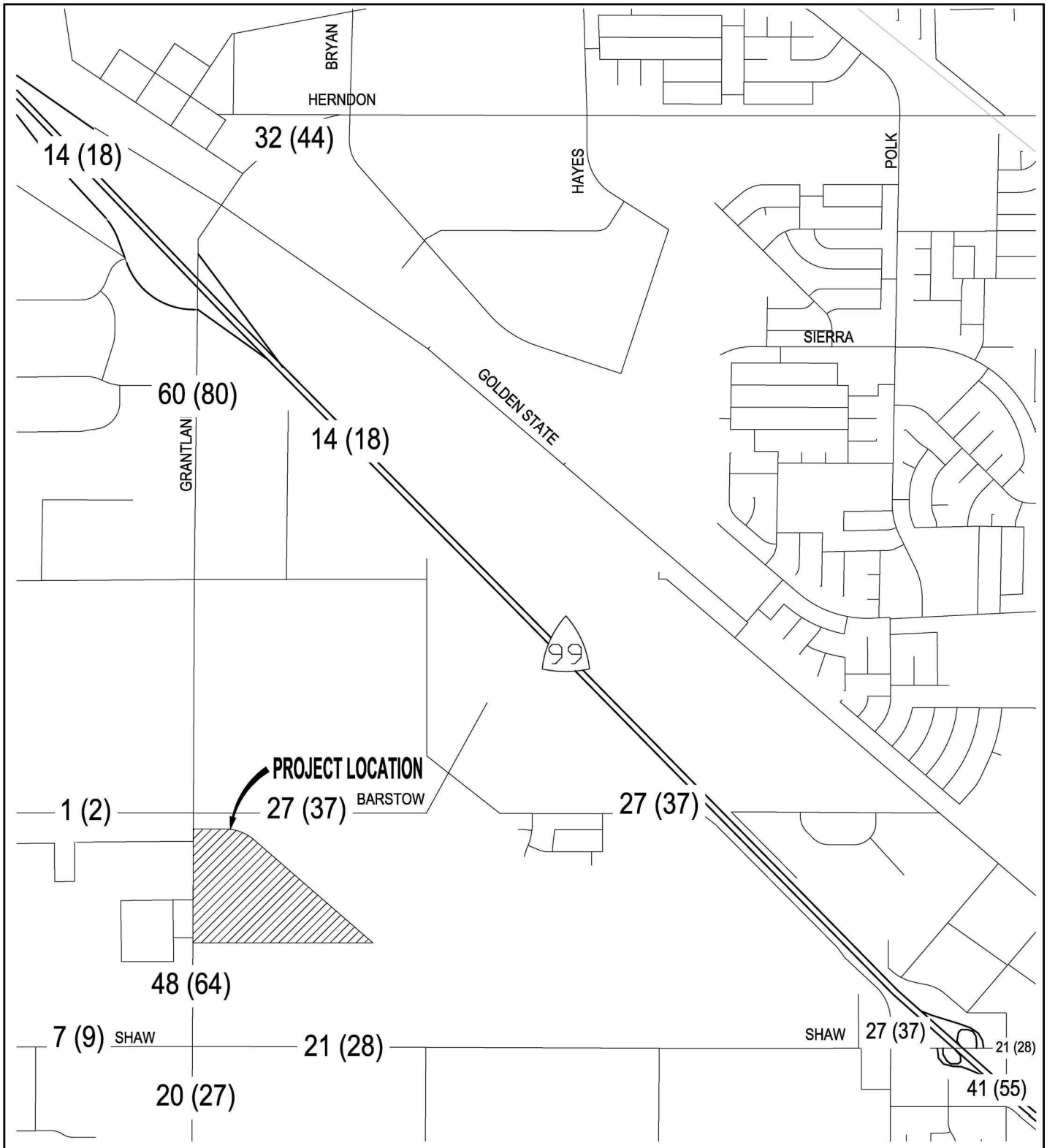
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Proposed Tract 6294
Fresno, California

PROJECT TRIP DISTRIBUTION PERCENTAGES

Not to Scale



Proposed Tract 6294
Fresno, California

PEAK-HOUR PROJECT TRAFFIC VOLUMES

Not to Scale

John Rowland

From: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Sent: Monday, December 16, 2019 4:44 PM
To: John Rowland
Cc: Sufia Samaan; Jill Gormley; Ara Chekerdemian; Bill Walls; bspaunhurst@fresnocountyca.gov; Padilla, Dave@DOT
Subject: RE: Traffic Study Scope Request - Tract 6294

Good Afternoon John,

Please add the intersection of Shaw and Polk to this scope. Additionally, we will need a 5-year collision analysis at all study location using SWITRS data and peak hour traffic signal warrants at all unsignalized locations. For Veterans Blvd, the anticipated completion of the interchange is 2024 and the completion of Veterans Blvd between Shaw and Barstow is Spring/Summer of 2021.

Thanks,

Harmanjit Dhaliwal, PE

City of FRESNO
Public Works Department
Traffic Operations & Planning Division
2600 Fresno Street, Room 4064
Fresno, CA 93721
Ph: (559) 621-8694
Harmanjit.Dhaliwal@fresno.gov

From: John Rowland [mailto:johnrowland@peters-engineering.com]
Sent: Tuesday, December 10, 2019 6:08 PM
To: Harmanjit Dhaliwal
Cc: Sufia Samaan; Jill Gormley; Ara Chekerdemian; Bill Walls; bspaunhurst@fresnocountyca.gov; Padilla, Dave@DOT
Subject: Traffic Study Scope Request - Tract 6294

Hello all,

If at all possible, we would like to attempt to count the study intersections before the holidays, which does not give us much time. So anything you can do to assist us with specifying the study intersections as soon as possible would be appreciated.

Thanks,

John Rowland, PE, TE
PETERS ENGINEERING GROUP
952 Pollasky Avenue
Clovis, California 93612
Phone: (559) 299-1544 Ext. 112
Fax: (559) 299-1722

John Rowland

From: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Sent: Wednesday, December 18, 2019 1:53 PM
To: John Rowland; Harmanjit Dhaliwal
Cc: Sufia Samaan; Jill Gormley; Ara Chekerdemian; Bill Walls; Padilla, Dave@DOT
Subject: RE: Traffic Study Scope Request - Tract 6294

Good Afternoon John,

I can't recall if we have spoken about this project yet and I apologize for the delay in response. With 44% of peak hour traffic heading north up Grantland to the 99, I would recommend studying the intersections through that entire stretch. I believe heading East on Shaw is all the City's so that is up to them.

Respectfully,

Brian Spaunhurst| Senior Planner
Department of Public Works and Planning | Design Division
2220 Tulare St. 7th Floor Fresno, CA 93721
Main Office: (559) 600-4109 Direct: (559) 600-4532
Your input matters! Customer Service Survey

From: John Rowland <johnrowland@peters-engineering.com>
Sent: Tuesday, December 10, 2019 6:08 PM
To: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: Sufia Samaan <Sufia.Samaan@fresno.gov>; Jill Gormley <Jill.Gormley@fresno.gov>; Ara Chekerdemian <Ara.Chekerdemian@Lennar.com>; Bill Walls <Bill.Walls@Lennar.com>; Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>; Padilla, Dave@DOT <dave.padilla@dot.ca.gov>
Subject: Traffic Study Scope Request - Tract 6294

CAUTION!!! - EXTERNAL EMAIL - THINK BEFORE YOU CLICK

Hello all,

If at all possible, we would like to attempt to count the study intersections before the holidays, which does not give us much time. So anything you can do to assist us with specifying the study intersections as soon as possible would be appreciated.

Thanks,

John Rowland, PE, TE
PETERS ENGINEERING GROUP
952 Pollasky Avenue
Clovis, California 93612
Phone: (559) 299-1544 Ext. 112
Fax: (559) 299-1722

APPENDIX B
TRAFFIC STUDY CHECKLIST

CITY OF FRESNO
PUBLIC WORKS DEPARTMENT
TRAFFIC STUDY CHECKLIST

APPLICANT: LENNAR HOMES OF CALIFORNIA

ASSIGNED PLANNER: CHRIS LANG

ACCELA/FAASTER REFERENCE NUMBER: P20-00492

Traffic Study Submittal:

- ☑ Was prepared based on a scope of work approved by the City Traffic Engineer
- ☑ Used the most recent version of Synchro for intersection analysis SYNCHRO 9 PER SCOPE LETTER
- ☑ Used the most recent version of the ITE Trip Generation
- ☑ Was prepared and reviewed under the supervision and direction of a qualified engineer or authorized owner/principal of firm
- ☑ Was prepared using count data collected within one year of the submittal date
- ☑ Includes an electronic copy, assembled as a complete document
- ☑ Includes One (1) hard copy
- ☑ Conforms to the most recent version of the City's Traffic Study Guidelines
- ☑ Includes operational analysis files (Synchro)

Traffic Study includes:

- ☑ Entitlement/Accela (FAASTER) No./ Tract or Parcel Map No.
- ☑ Assigned Planner's name
- ☑ Stamp and/or signature of qualified engineer or authorized owner/principal of firm stating the study was prepared and reviewed under their supervision and direction
- ☑ Project description
- ☑ Methodology description
- ☑ Project Trip Generation
- ☑ Trip Generation Comparison (if a General Plan Amendment)
- ☑ Delay analysis
- ☑ Queuing analysis for all movements at all study intersections
- ☑ Discussion of existing and planned bicycle, pedestrian and transit facilities
- ☑ Collision analysis
- ☑ On-site circulation analysis
- ☑ Mitigations and Recommendations

CITY OF FRESNO
PUBLIC WORKS DEPARTMENT
TRAFFIC STUDY CHECKLIST

APPLICANT: LENNAR HOMES OF CALIFORNIA

ASSIGNED PLANNER: CHRIS LANG

ACCELA/FAASTER REFERENCE NUMBER: P20-00492

Included Figures:

- ☑ Vicinity Map
- ☑ Site Plan
- ☑ Trip distribution at intersections/along roadways
- ☑ Trip distribution at proposed access points
- ☑ Volumes for all scenarios analyzed
- ☑ Lane configurations for all scenarios analyzed
- ☑ Locations of approved projects - IN TABLE

Included Appendices:

- ☑ Approved Scope of Work
- ☑ Model request
- ☑ Model data
- ☑ Count data
- ☑ Level of Service analysis worksheets
- ☑ Collision data - TABLE IN TEXT
- ☑ Warrants

CERTIFICATION OF APPLICANT: Read each of the statements below. After you have read the statements and understand them, please sign and date in the space provided at the end of this section:

1) I certify that I have read the Traffic Study Checklist thoroughly, followed any and all instruction, and have supplied the necessary information to allow staff to review my study or application and that the supplied information is true and correct information herein to the best of my knowledge and belief.

2) I understand that falsification or misrepresentation on my part of any of the information that I have supplied above constitutes sufficient grounds for return of my submittal, or should any of my responses be determined false, misleading and/or incomplete will subject my application/plans to review delays and may result in the requirement for the applicant to pay additional review fees.

~~Applicant~~ PREPARER'S signature: _____ Date: 2-26-20

APPENDIX C
TRAFFIC COUNT DATA SHEETS

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

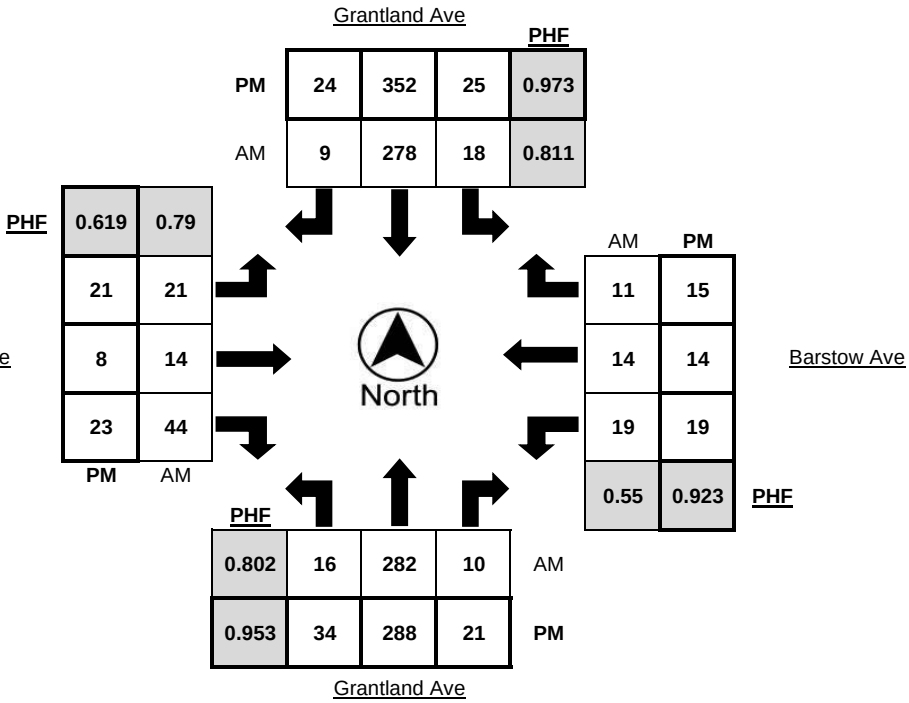
LOCATION Barstow Ave @ Grantland Ave
LATITUDE 36.8151687
COUNTY Fresno
LONGITUDE -119.9165297
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	3	49	3	2	1	90	3	1	3	3	19	1	6	8	6	0
7:15 AM - 7:30 AM	4	86	2	4	6	58	2	2	9	4	8	0	2	0	1	0
7:30 AM - 7:45 AM	6	86	4	1	7	71	2	1	6	5	11	1	5	3	2	0
7:45 AM - 8:00 AM	3	61	1	1	4	59	2	4	3	2	6	0	6	3	2	1
8:00 AM - 8:15 AM	2	78	2	0	7	56	4	3	4	4	6	2	1	1	2	0
8:15 AM - 8:30 AM	4	61	1	1	6	76	10	6	7	5	4	0	1	1	5	0
8:30 AM - 8:45 AM	2	63	1	0	4	40	4	4	4	2	8	1	3	4	2	1
8:45 AM - 9:00 AM	4	56	2	1	1	37	3	1	3	2	6	0	1	1	2	0
TOTAL	**28**	**540**	**16**	**10**	**36**	**487**	**30**	**22**	**39**	**27**	**68**	**5**	**25**	**21**	**22**	**2**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	4	71	4	2	7	48	6	0	7	4	3	1	2	3	3	1
4:15 PM - 4:30 PM	7	71	1	2	6	59	5	1	10	2	4	0	3	4	4	0
4:30 PM - 4:45 PM	6	85	3	1	4	65	5	2	2	0	5	1	2	6	2	1
4:45 PM - 5:00 PM	11	66	5	1	5	84	6	1	5	1	4	0	2	6	2	0
5:00 PM - 5:15 PM	7	73	5	0	9	89	4	0	6	2	1	1	6	4	2	0
5:15 PM - 5:30 PM	11	64	7	2	4	91	3	2	8	4	9	0	4	1	6	1
5:30 PM - 5:45 PM	6	78	6	0	5	89	4	1	2	1	8	0	3	5	4	0
5:45 PM - 6:00 PM	10	73	3	0	7	83	13	1	5	1	5	0	6	4	3	0
TOTAL	**62**	**581**	**34**	**8**	**47**	**608**	**46**	**8**	**45**	**15**	**39**	**3**	**28**	**33**	**26**	**3**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	16	282	10	8	18	278	9	8	21	14	44	2	19	14	11	1
5:00 PM - 6:00 PM	34	288	21	2	25	352	24	4	21	8	23	1	19	14	15	1

	PHF	Trucks
AM	0.885	2.6%
PM	0.991	0.9%



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Turning Movement Report

Prepared For:

Peters Engineering Group
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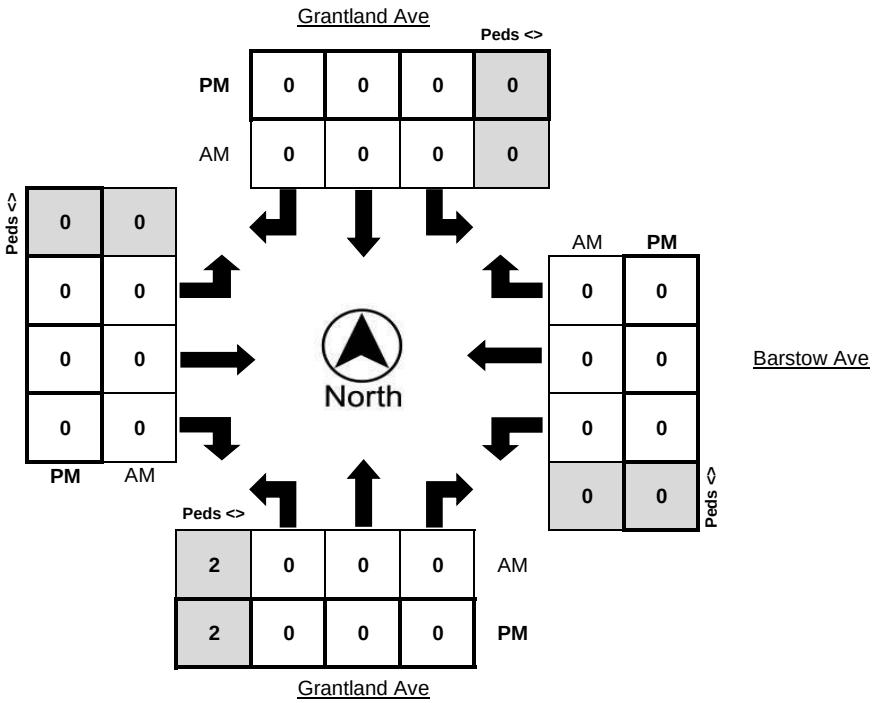
LOCATION Barstow Ave @ Grantland Ave
LATITUDE 36.8152
COUNTY Fresno
LONGITUDE -119.9165
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	2
PM Peak Total	**0**	**2**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

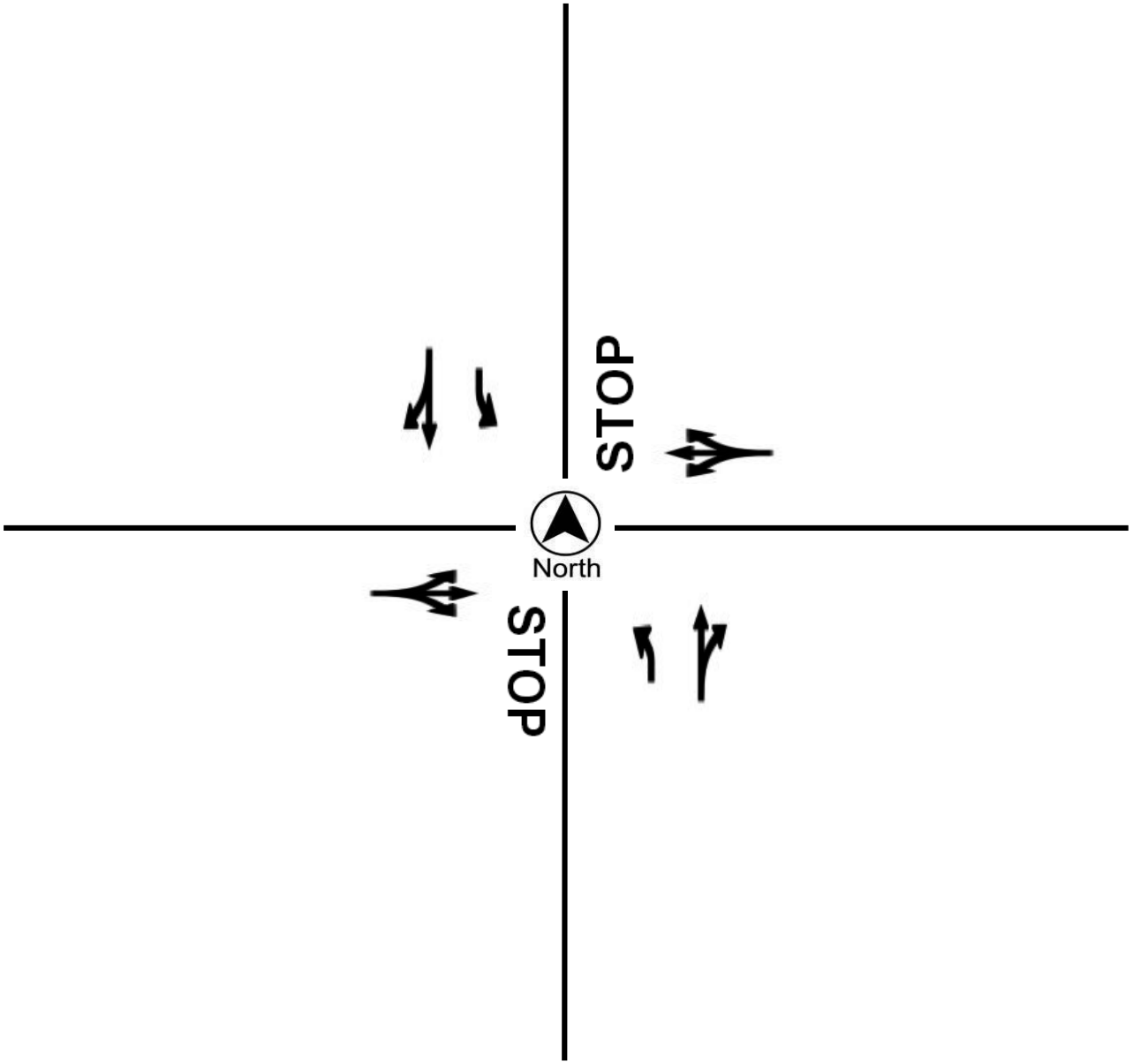
Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION	Barstow Ave @ Grantland Ave	**N/S STREET**	Grantland Ave
COUNTY	Fresno	**E/W STREET**	Barstow Ave
COLLECTION DATE	Thursday, December 19, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	Two-Way Stop

COMMENTS



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Hanford, CA 93230

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Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

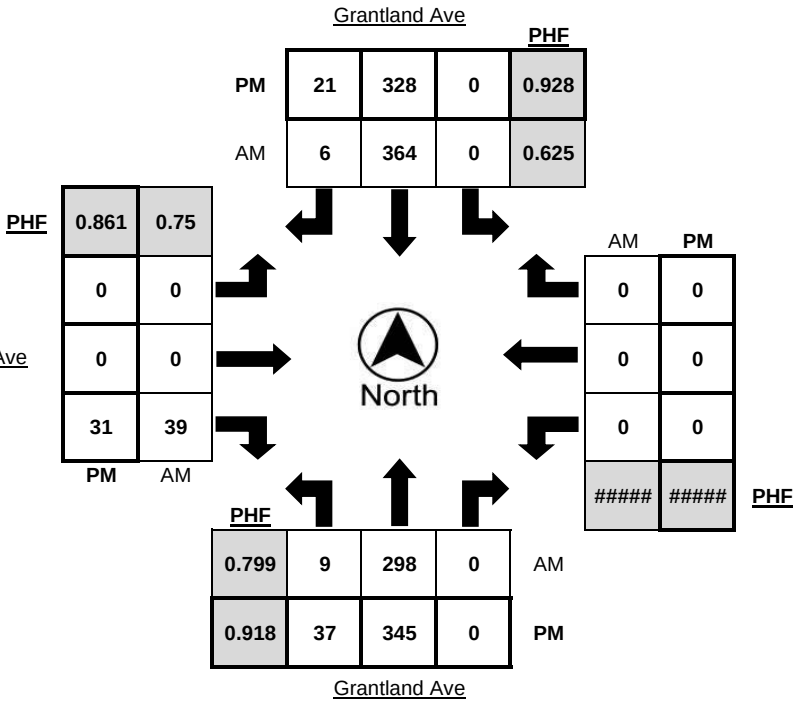
LOCATION Grantland Ave @ San Ramon / N Site Access
LATITUDE 36.8134
COUNTY Fresno
LONGITUDE -119.9165
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	4	52	0	3	0	147	1	0	0	0	13	0	0	0	0	0
7:15 AM - 7:30 AM	1	95	0	3	0	67	1	2	0	0	11	0	0	0	0	0
7:30 AM - 7:45 AM	4	90	0	2	0	68	0	3	0	0	7	0	0	0	0	0
7:45 AM - 8:00 AM	0	61	0	2	0	82	4	4	0	0	8	1	0	0	0	0
8:00 AM - 8:15 AM	2	88	0	1	0	70	6	6	0	0	13	0	0	0	0	0
8:15 AM - 8:30 AM	3	72	0	1	0	72	4	6	0	0	6	1	0	0	0	0
8:30 AM - 8:45 AM	1	65	0	5	0	50	3	1	0	0	5	0	0	0	0	0
8:45 AM - 9:00 AM	1	61	0	1	0	51	1	0	0	0	4	0	0	0	0	0
TOTAL	**16**	**584**	**0**	**18**	**0**	**607**	**20**	**22**	**0**	**0**	**67**	**2**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	5	77	0	2	0	72	3	3	0	0	4	0	0	0	0	0
4:15 PM - 4:30 PM	12	79	0	2	0	85	9	1	0	0	6	0	0	0	0	0
4:30 PM - 4:45 PM	9	95	0	0	0	82	4	3	0	0	9	1	0	0	0	0
4:45 PM - 5:00 PM	4	86	0	0	0	85	4	2	0	0	8	0	0	0	0	0
5:00 PM - 5:15 PM	12	85	0	1	0	76	4	1	0	0	8	0	0	0	0	0
5:15 PM - 5:30 PM	5	79	0	1	0	80	3	2	0	0	5	0	0	0	0	0
5:30 PM - 5:45 PM	2	85	0	1	0	95	4	1	0	0	8	0	0	0	0	0
5:45 PM - 6:00 PM	5	84	0	0	0	96	9	4	0	0	9	0	0	0	0	0
TOTAL	**54**	**670**	**0**	**7**	**0**	**671**	**40**	**17**	**0**	**0**	**57**	**1**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	9	298	0	10	0	364	6	9	0	0	39	1	0	0	0	0
4:15 PM - 5:15 PM	37	345	0	3	0	328	21	7	0	0	31	1	0	0	0	0

	PHF	Trucks
AM	0.825	2.8%
PM	0.957	1.4%



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952 Pollasky Avenue
Clovis, CA 93612

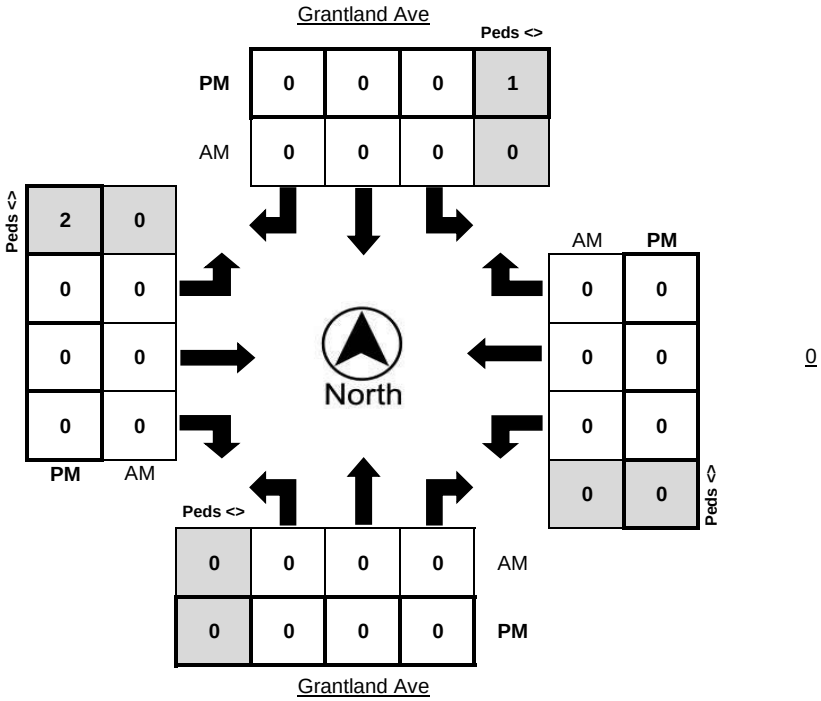
LOCATION Grantland Ave @ San Ramon / N Site Access
LATITUDE 36.8134
COUNTY Fresno
LONGITUDE -119.9165
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	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**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**3**



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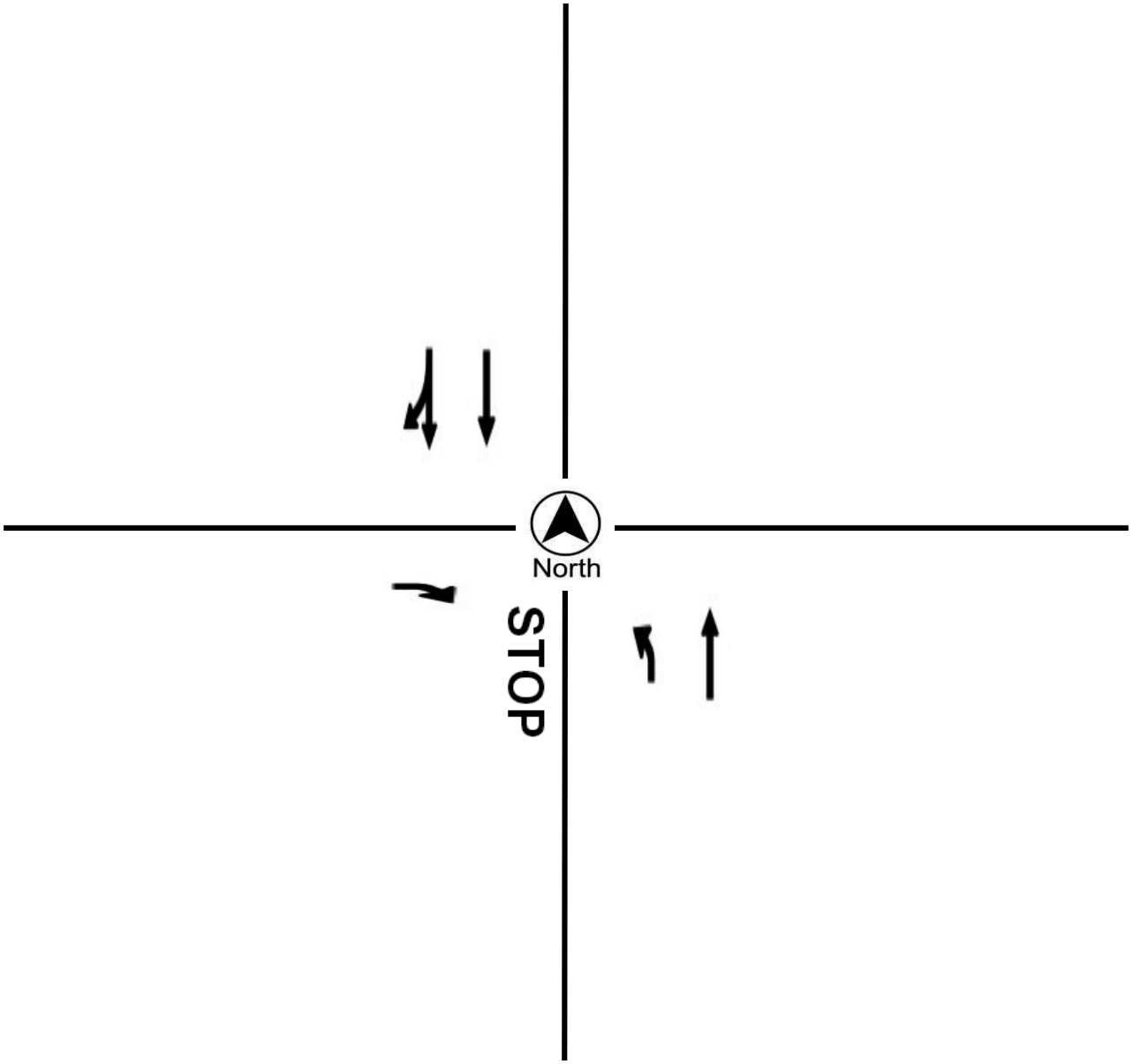
Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION	Grantland Ave @ San Ramon / N Site Access	**N/S STREET**	Grantland Ave / Grantland Ave
COUNTY	Fresno	**E/W STREET**	/ San Ramon Ave
COLLECTION DATE	Thursday, December 19, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



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Clovis, CA 93612

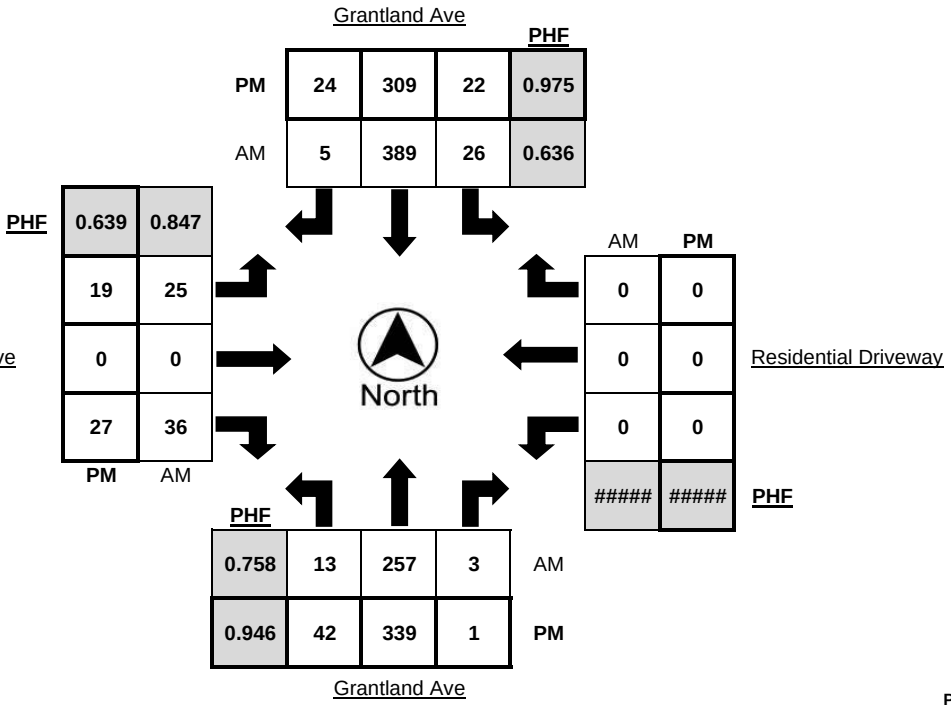
LOCATION Grantland Ave @ San Jose Ave / S Site Access
LATITUDE 36.8116
COUNTY Fresno
LONGITUDE -119.9165
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	42	0	4	9	156	0	0	5	0	9	0	0	0	0	0
7:15 AM - 7:30 AM	9	79	0	2	10	71	1	2	6	0	12	0	0	0	0	0
7:30 AM - 7:45 AM	3	84	3	2	3	72	2	3	7	0	8	1	0	0	0	0
7:45 AM - 8:00 AM	1	52	0	2	4	90	2	4	7	0	7	0	0	0	0	0
8:00 AM - 8:15 AM	3	68	0	2	11	66	0	3	9	0	4	0	1	0	0	0
8:15 AM - 8:30 AM	4	64	0	1	7	74	4	8	9	0	5	0	0	0	0	0
8:30 AM - 8:45 AM	0	50	0	6	2	46	4	1	5	0	3	0	0	0	0	0
8:45 AM - 9:00 AM	2	56	0	1	4	47	4	0	7	0	5	0	0	0	0	0
TOTAL	**22**	**495**	**3**	**20**	**50**	**622**	**17**	**21**	**55**	**0**	**53**	**1**	**1**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	3	75	0	2	4	73	3	4	2	0	7	0	0	0	0	0
4:15 PM - 4:30 PM	6	86	0	2	4	76	7	1	1	0	4	0	0	0	0	0
4:30 PM - 4:45 PM	16	83	1	0	12	74	4	3	9	0	5	0	0	0	0	0
4:45 PM - 5:00 PM	14	87	0	0	3	81	7	3	2	0	7	0	0	0	0	0
5:00 PM - 5:15 PM	6	83	0	1	3	78	6	1	7	0	11	0	0	0	0	0
5:15 PM - 5:30 PM	5	77	0	1	9	72	3	1	4	0	2	0	0	0	0	0
5:30 PM - 5:45 PM	13	81	0	2	5	98	6	2	2	0	1	0	0	0	0	0
5:45 PM - 6:00 PM	9	74	0	0	6	86	9	2	4	0	9	0	0	0	0	0
TOTAL	**72**	**646**	**1**	**8**	**46**	**638**	**45**	**17**	**31**	**0**	**46**	**0**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	13	257	3	10	26	389	5	9	25	0	36	1	0	0	0	0
4:15 PM - 5:15 PM	42	339	1	3	22	309	24	8	19	0	27	0	0	0	0	0

	PHF	Trucks
AM	0.853	2.7%
PM	0.960	1.4%



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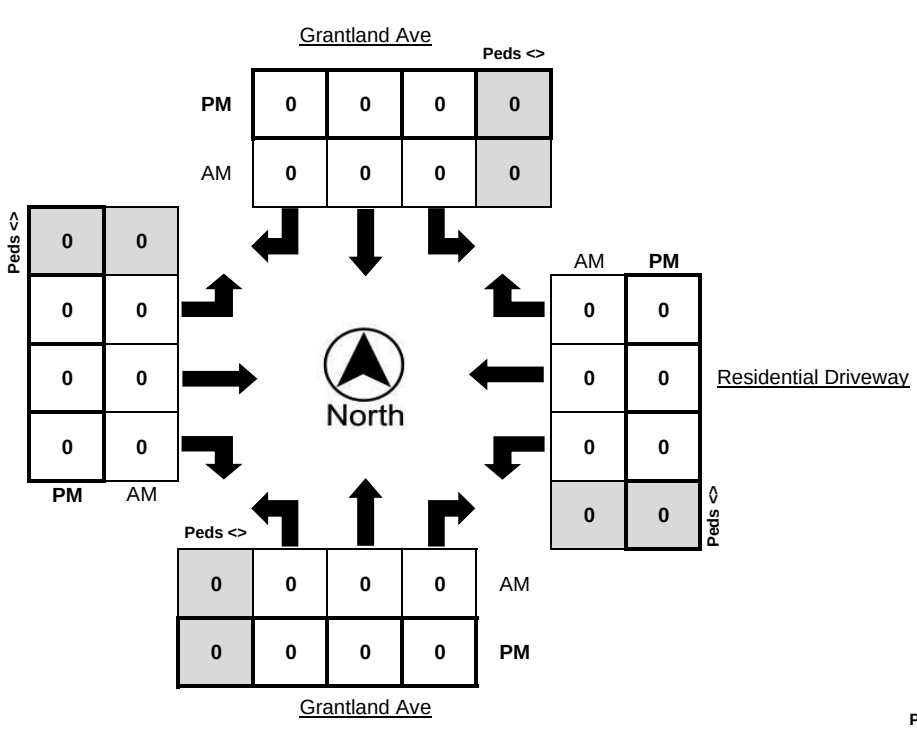
LOCATION Grantland Ave @ San Jose Ave / S Site Access
LATITUDE 36.8116
COUNTY Fresno
LONGITUDE -119.9165
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	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**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	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**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	**Peds**
AM Peak Total	0	0
PM Peak Total	**0**	**0**



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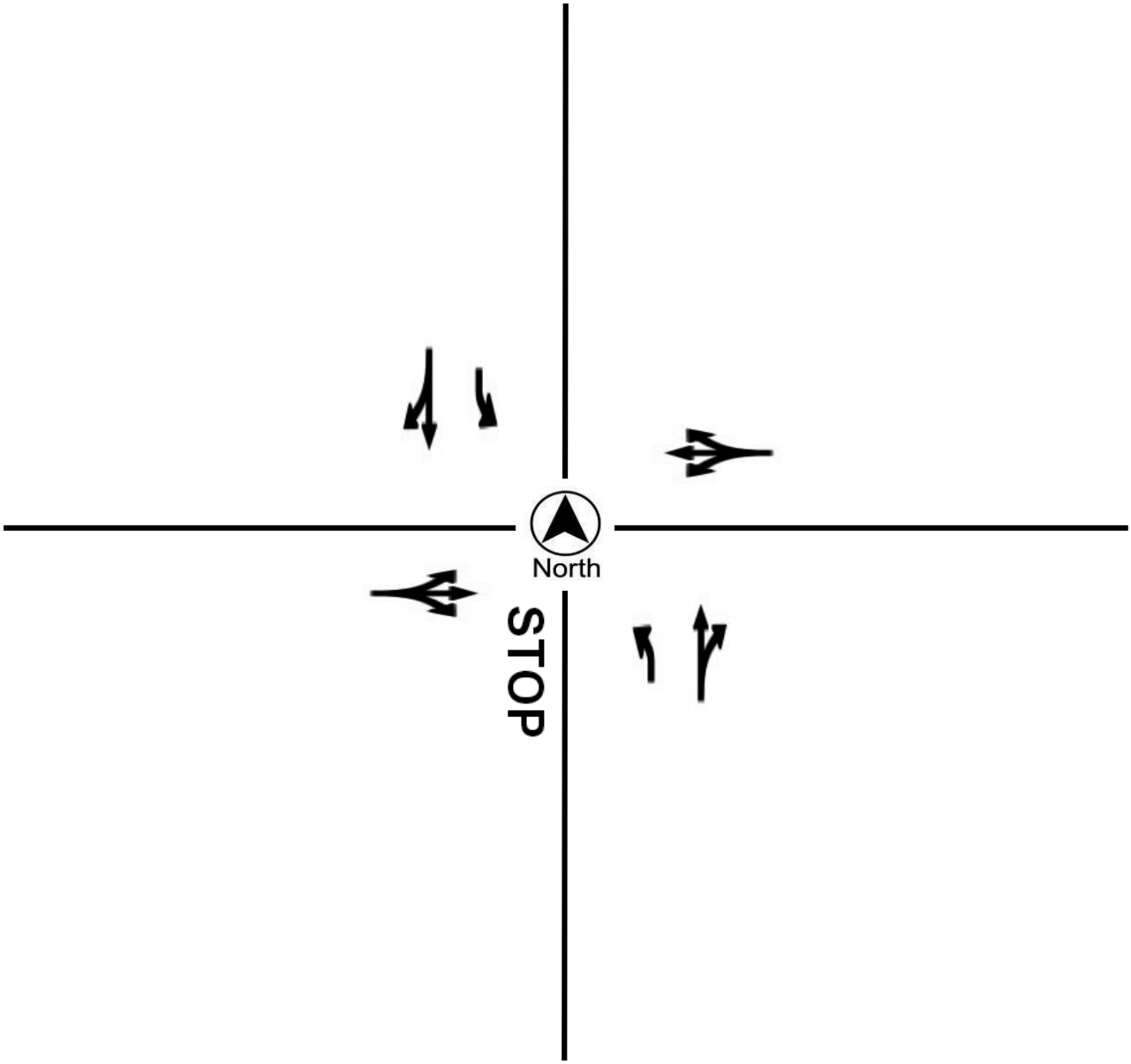
Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Grantland Ave @ San Jose Ave / S Site Access
N/S STREET Grantland Ave / Grantland Ave
COUNTY Fresno
E/W STREET Residential Driveway / San Jose Ave
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear
CYCLE TIME N/A
CONTROL TYPE One-Way Stop

COMMENTS All southbound left turns shown were U-turns.



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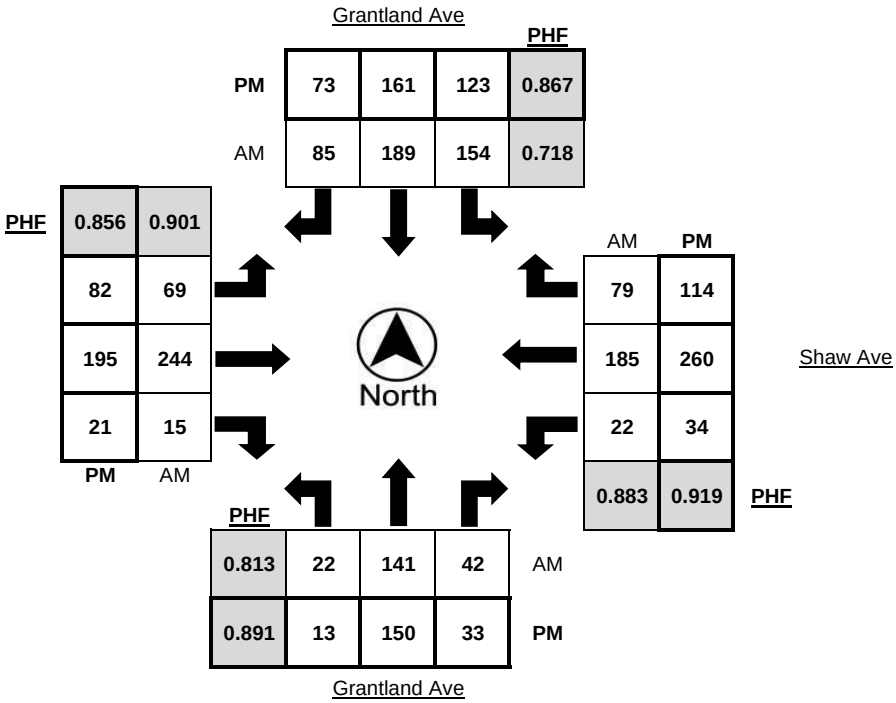
LOCATION Grantland Ave @ Shaw Ave
LATITUDE 36.8079
COUNTY Fresno
LONGITUDE -119.9165
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	2	30	6	3	51	61	37	3	15	63	4	3	5	53	15	2
7:15 AM - 7:30 AM	9	44	10	4	29	53	19	2	18	68	5	2	6	36	22	3
7:30 AM - 7:45 AM	5	39	16	1	38	36	10	5	21	66	3	3	7	38	23	5
7:45 AM - 8:00 AM	6	28	10	2	36	39	19	4	15	47	3	4	4	58	19	7
8:00 AM - 8:15 AM	4	26	6	3	31	34	5	3	18	49	4	2	2	41	20	5
8:15 AM - 8:30 AM	4	21	7	2	40	33	5	8	18	52	0	4	4	35	25	2
8:30 AM - 8:45 AM	3	18	9	0	27	22	4	3	13	48	5	2	9	24	26	4
8:45 AM - 9:00 AM	5	13	9	2	19	24	7	1	12	54	3	0	3	42	22	1
TOTAL	**38**	**219**	**73**	**17**	**271**	**302**	**106**	**29**	**130**	**447**	**27**	**20**	**40**	**327**	**172**	**29**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	3	20	9	1	23	42	11	0	27	57	3	2	2	48	29	0
4:15 PM - 4:30 PM	5	36	5	2	18	41	23	4	27	51	3	2	10	49	31	1
4:30 PM - 4:45 PM	4	47	9	0	33	30	15	6	23	42	9	1	3	61	32	1
4:45 PM - 5:00 PM	5	49	4	0	34	40	14	0	23	43	7	0	6	50	27	0
5:00 PM - 5:15 PM	2	39	12	0	34	37	18	2	20	63	4	0	10	68	31	1
5:15 PM - 5:30 PM	4	26	6	2	34	20	18	0	26	38	9	1	7	63	31	0
5:30 PM - 5:45 PM	2	46	7	0	27	57	19	3	21	53	3	0	9	55	23	0
5:45 PM - 6:00 PM	5	39	8	0	28	47	18	1	15	41	5	1	8	74	29	0
TOTAL	**30**	**302**	**60**	**5**	**231**	**314**	**136**	**16**	**182**	**388**	**43**	**7**	**55**	**468**	**233**	**3**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	22	141	42	10	154	189	85	14	69	244	15	12	22	185	79	17
5:00 PM - 6:00 PM	13	150	33	2	123	161	73	6	82	195	21	2	34	260	114	1

	PHF	Trucks
AM	0.912	4.3%
PM	0.931	0.9%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

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Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

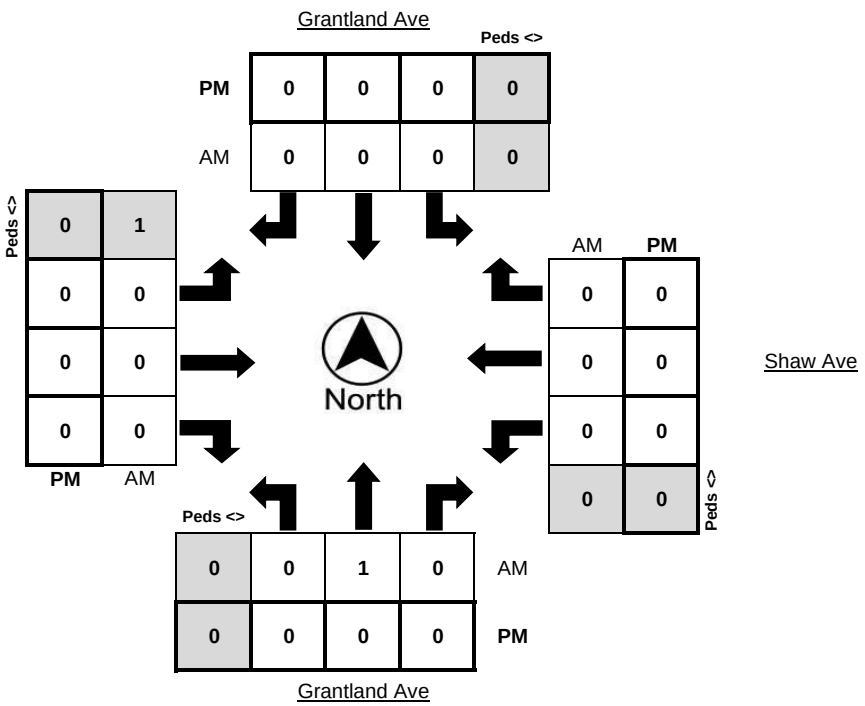
LOCATION Grantland Ave @ Shaw Ave
LATITUDE 36.8079
COUNTY Fresno
LONGITUDE -119.9165
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	1	1
PM Peak Total	**0**	**0**



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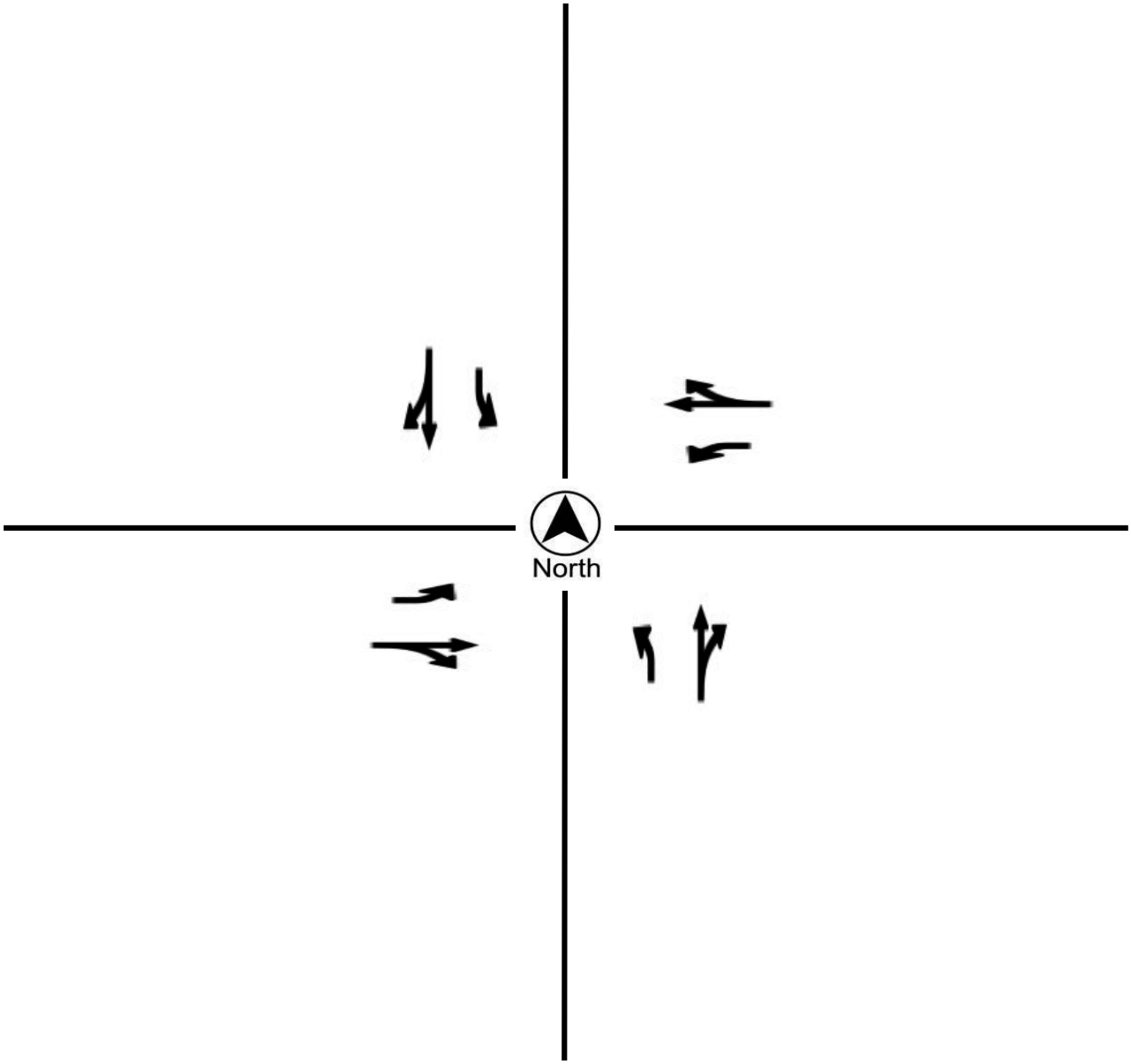
Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION	Grantland Ave @ Shaw Ave	**N/S STREET**	Grantland Ave
COUNTY	Fresno	**E/W STREET**	Shaw Ave
COLLECTION DATE	Thursday, December 19, 2019	**WEATHER**	Clear
CYCLE TIME	97 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



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952 Pollasky Avenue
Clovis, CA 93612

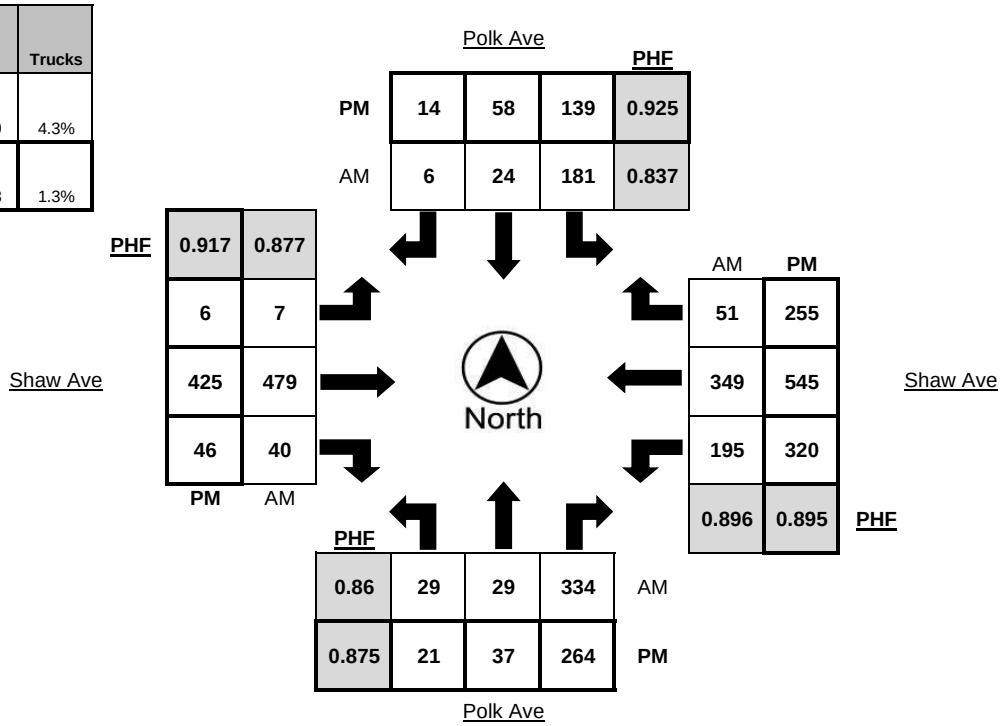
LOCATION Shaw Ave @ Polk Ave
LATITUDE 36.8080
COUNTY Fresno
LONGITUDE -119.8895
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	4	12	68	1	31	30	0	0	3	84	11	3	56	84	15	4
7:15 AM - 7:30 AM	11	11	92	5	55	6	2	0	1	108	8	3	41	81	10	7
7:30 AM - 7:45 AM	4	6	82	2	46	6	2	2	3	137	10	8	46	102	15	14
7:45 AM - 8:00 AM	9	7	67	1	45	7	1	1	0	108	6	3	69	82	15	8
8:00 AM - 8:15 AM	5	5	93	3	35	5	1	1	3	126	16	8	39	84	11	8
8:15 AM - 8:30 AM	3	17	79	3	50	13	4	0	3	88	7	8	66	69	17	7
8:30 AM - 8:45 AM	5	6	93	0	37	7	2	1	3	124	8	3	39	55	19	4
8:45 AM - 9:00 AM	5	7	79	3	37	12	1	1	2	92	2	4	41	55	22	5
TOTAL	**46**	**71**	**653**	**18**	**336**	**86**	**13**	**6**	**18**	**867**	**68**	**40**	**397**	**612**	**124**	**57**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	8	18	65	1	26	8	3	2	2	113	8	7	67	106	49	8
4:15 PM - 4:30 PM	5	10	73	1	36	7	5	0	2	84	9	4	85	156	67	4
4:30 PM - 4:45 PM	9	13	81	1	29	7	3	1	2	112	5	3	72	119	42	0
4:45 PM - 5:00 PM	5	13	72	2	38	17	2	0	5	93	7	2	79	153	72	4
5:00 PM - 5:15 PM	6	11	64	0	30	12	1	4	1	113	8	5	78	115	55	1
5:15 PM - 5:30 PM	4	8	60	1	37	14	6	2	1	115	14	2	82	132	55	1
5:30 PM - 5:45 PM	6	8	78	0	35	18	3	0	2	99	10	2	72	147	71	6
5:45 PM - 6:00 PM	5	10	62	1	37	14	4	0	2	98	14	1	88	151	74	1
TOTAL	**48**	**91**	**555**	**7**	**268**	**97**	**27**	**9**	**17**	**827**	**75**	**26**	**623**	**1079**	**485**	**25**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	29	29	334	11	181	24	6	4	7	479	40	22	195	349	51	37
5:00 PM - 6:00 PM	21	37	264	2	139	58	14	6	6	425	46	10	320	545	255	9

	PHF	Trucks
AM	0.939	4.3%
PM	0.953	1.3%



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Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

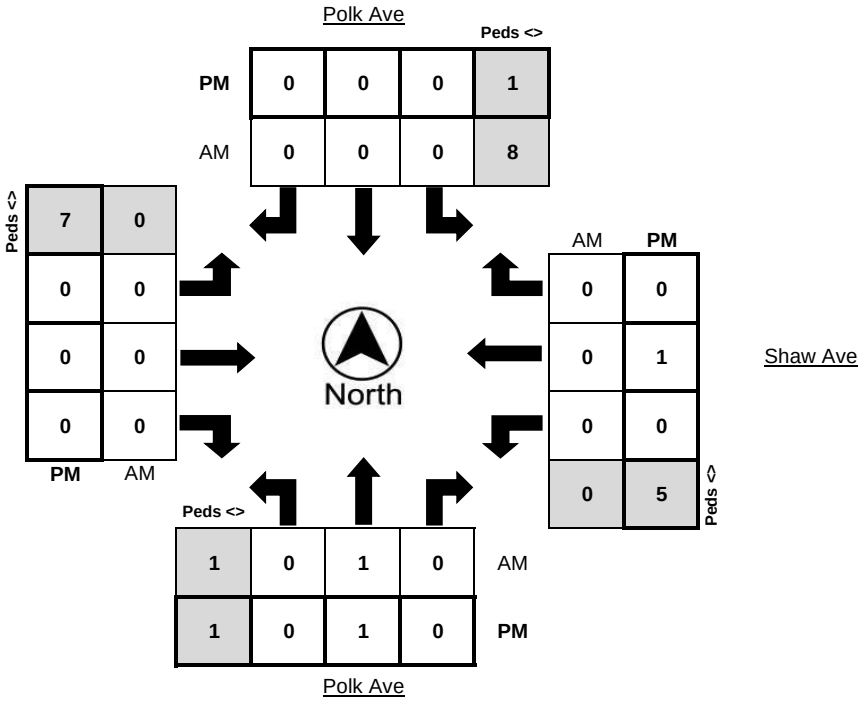
LOCATION Shaw Ave @ Polk Ave
LATITUDE 36.8080
COUNTY Fresno
LONGITUDE -119.8895
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM - 8:45 AM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**11**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	0	0	6	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM - 5:00 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2
5:00 PM - 5:15 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	4
5:45 PM - 6:00 PM	0	1	0	0	0	0	0	1	0	0	0	2	0	0	0	0
TOTAL	**0**	**1**	**1**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**12**	**0**	**1**	**0**	**10**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:15 AM - 8:15 AM	0	1	0	8	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	1	0	1	0	0	0	1	0	0	0	5	0	1	0	7

	Bikes	Peds
AM Peak Total	1	9
PM Peak Total	**2**	**14**



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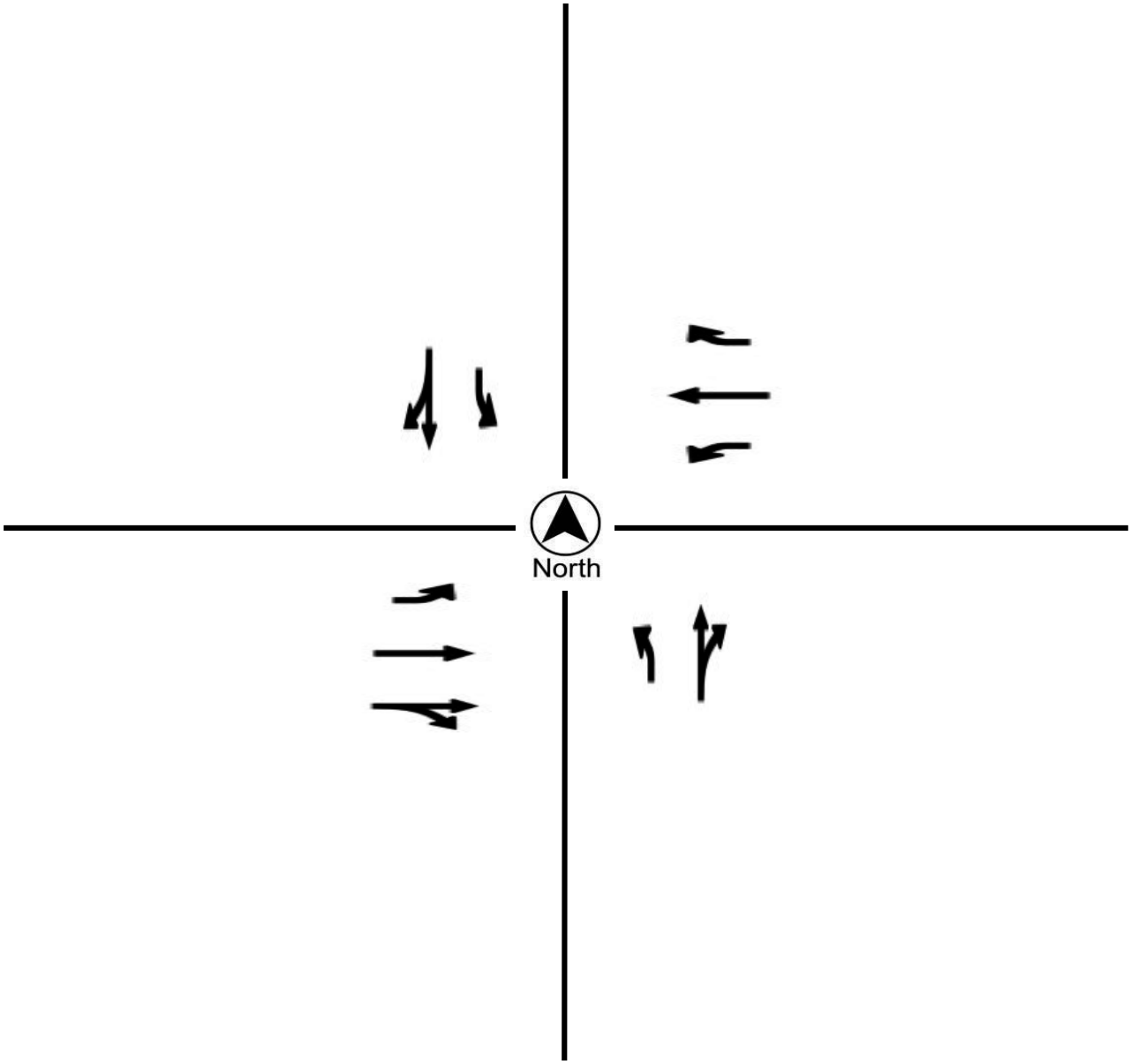
Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION	Shaw Ave @ Polk Ave	**N/S STREET**	Polk Ave / Polk Ave
COUNTY	Fresno	**E/W STREET**	Shaw Ave / Shaw Ave
COLLECTION DATE	Thursday, December 19, 2019	**WEATHER**	Clear
CYCLE TIME	103 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



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Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

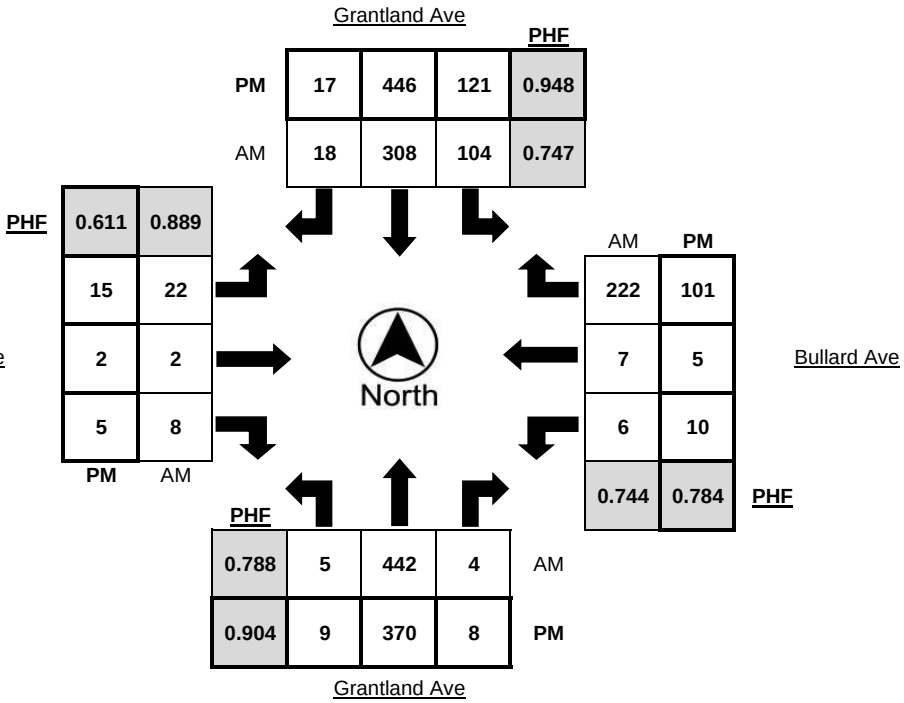
LOCATION Bullard Ave @ Grantland Ave
LATITUDE 36.822367°
COUNTY Fresno
LONGITUDE -119.916585°
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	1	76	1	4	7	99	0	0	13	2	4	2	4	1	34	1
7:15 AM - 7:30 AM	1	130	1	2	12	45	2	4	6	1	3	0	4	2	48	2
7:30 AM - 7:45 AM	2	108	3	3	16	71	1	3	3	1	3	0	3	2	43	0
7:45 AM - 8:00 AM	0	79	1	2	18	73	3	5	5	1	3	0	0	1	50	0
8:00 AM - 8:15 AM	1	142	0	2	26	73	5	7	7	0	0	0	2	3	74	2
8:15 AM - 8:30 AM	2	113	0	1	44	91	9	8	7	0	2	0	1	1	55	1
8:30 AM - 8:45 AM	0	64	1	5	23	65	6	1	8	0	0	0	2	0	16	0
8:45 AM - 9:00 AM	0	80	1	1	9	52	1	2	6	0	2	0	1	0	23	0
TOTAL	**7**	**792**	**8**	**20**	**155**	**569**	**27**	**30**	**55**	**5**	**17**	**2**	**17**	**10**	**343**	**6**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	2	79	3	3	35	108	3	4	1	1	0	0	4	0	17	0
4:15 PM - 4:30 PM	6	85	2	2	23	112	4	2	3	0	0	0	4	0	24	1
4:30 PM - 4:45 PM	1	100	2	0	32	118	4	3	4	1	3	1	2	3	32	1
4:45 PM - 5:00 PM	0	106	1	0	31	108	6	3	7	0	2	0	0	2	28	0
5:00 PM - 5:15 PM	1	82	1	1	35	93	2	3	5	2	2	1	2	2	17	0
5:15 PM - 5:30 PM	2	85	8	2	21	105	4	0	6	1	1	2	3	1	28	1
5:30 PM - 5:45 PM	2	77	2	1	32	127	3	0	1	1	1	0	3	4	20	0
5:45 PM - 6:00 PM	3	81	1	0	43	139	8	2	5	1	0	0	1	0	20	1
TOTAL	**17**	**695**	**20**	**9**	**252**	**910**	**34**	**17**	**32**	**7**	**9**	**4**	**19**	**12**	**186**	**4**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	5	442	4	8	104	308	18	23	22	2	8	0	6	7	222	3
4:00 PM - 5:00 PM	9	370	8	5	121	446	17	12	15	2	5	1	10	5	101	2

	PHF	Trucks
AM	0.862	3.0%
PM	0.918	1.8%



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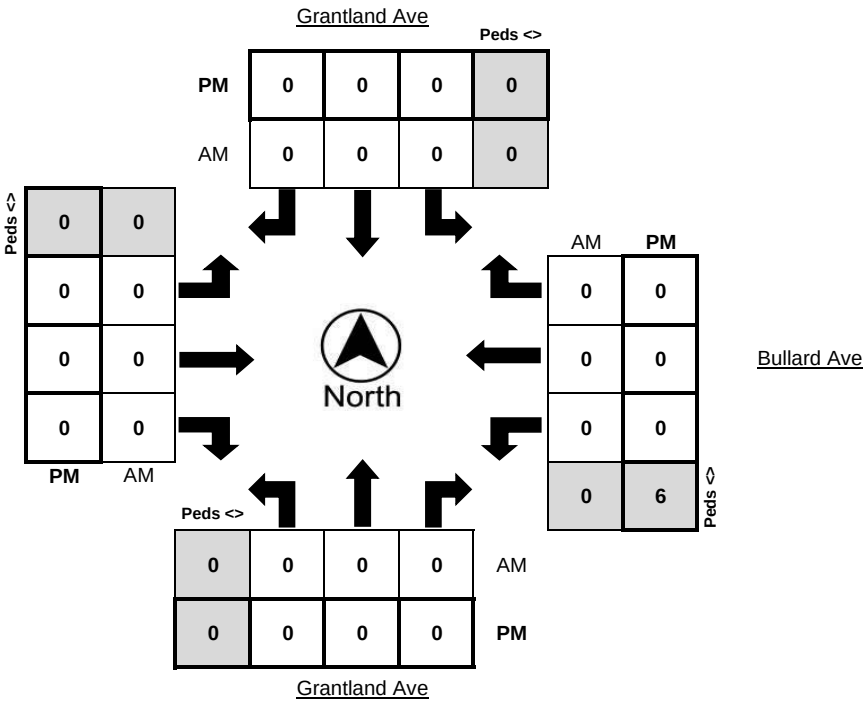
LOCATION Bullard Ave @ Grantland Ave
LATITUDE 36.822367°
COUNTY Fresno
LONGITUDE -119.916585°
COLLECTION DATE Thursday, December 19, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	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**	**7**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**6**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

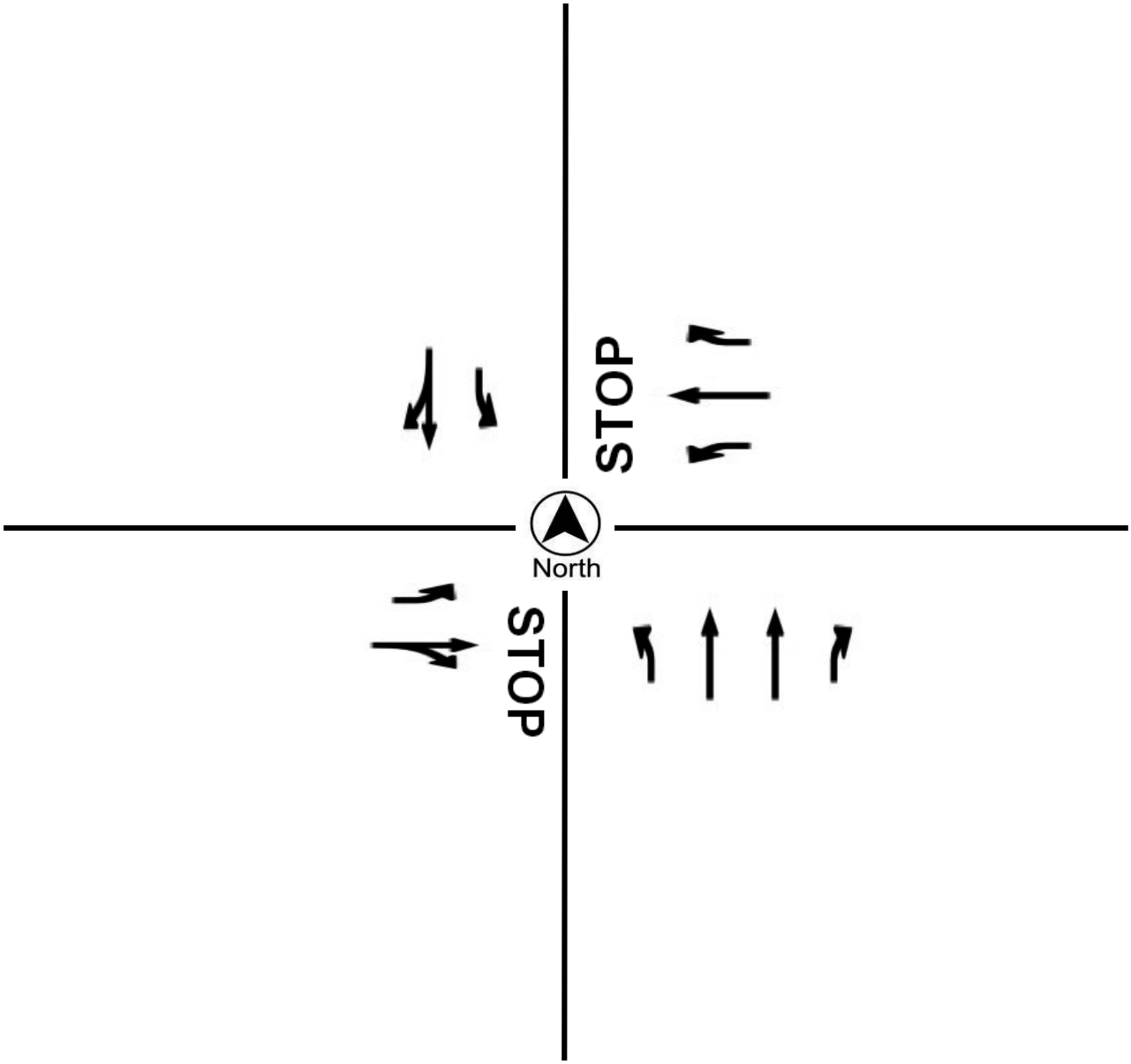
Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

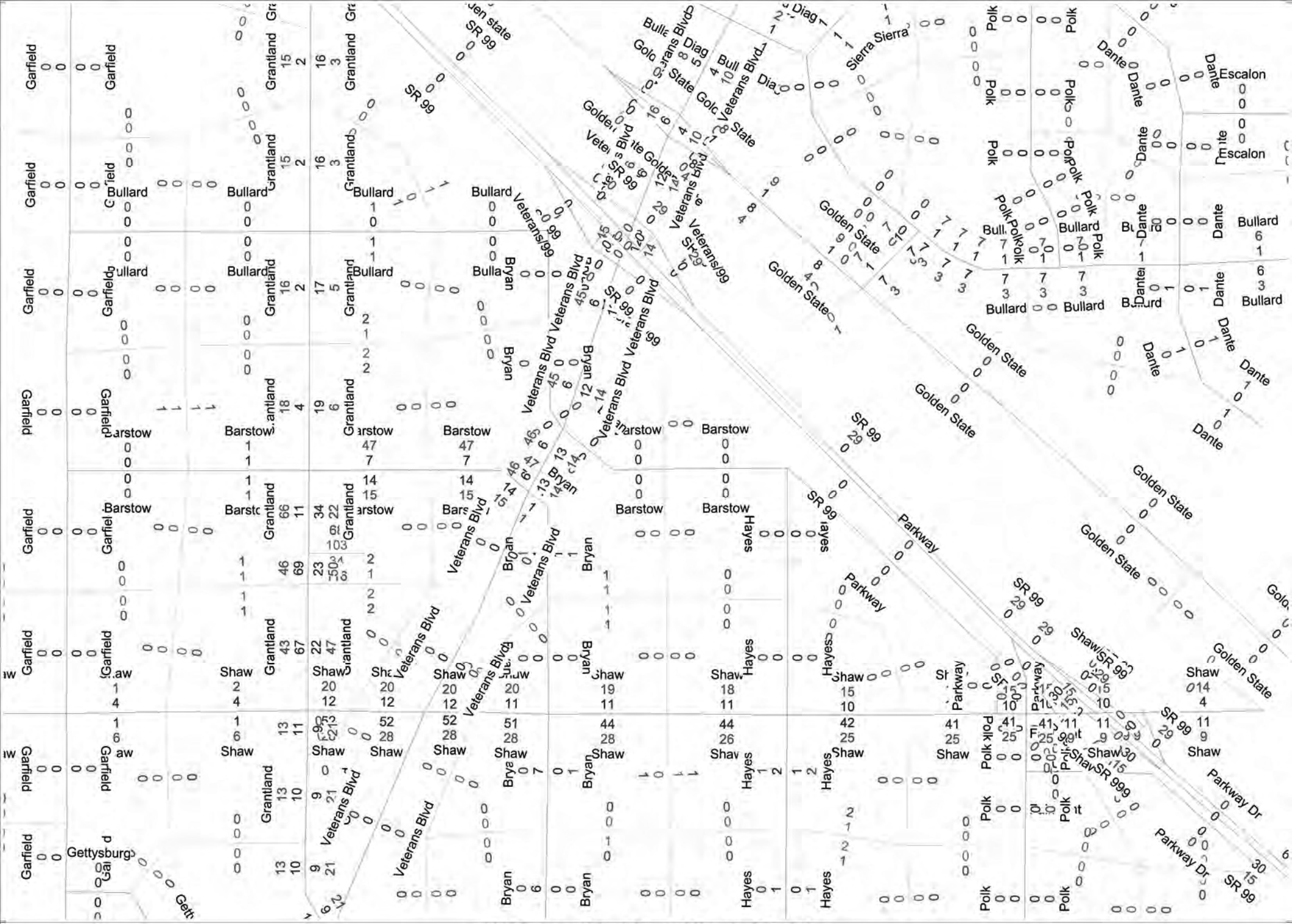
LOCATION	Bullard Ave @ Grantland Ave	**N/S STREET**	Grantland Ave / Grantland Ave
COUNTY	Fresno	**E/W STREET**	Bullard Ave / Bullard Ave
COLLECTION DATE	Thursday, December 19, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	Two-Way Stop

COMMENTS



APPENDIX D
FRESNO COUNTY TRAVEL MODEL

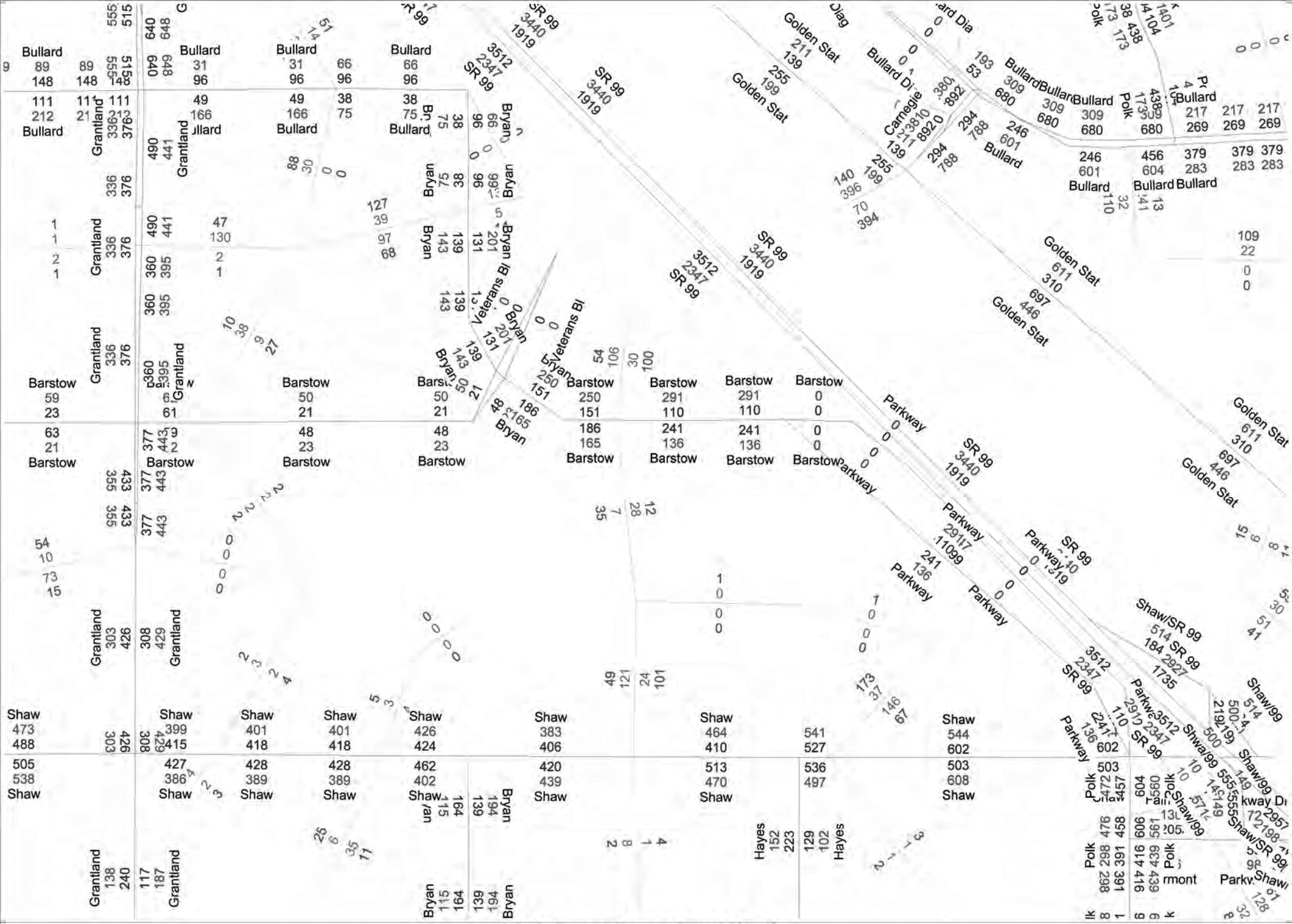
Select Zone Analysis Output and Loaded Networks



2035 Fresno County Travel Demand Model
Select Zone Analysis AM and PM Peak Hour

cube

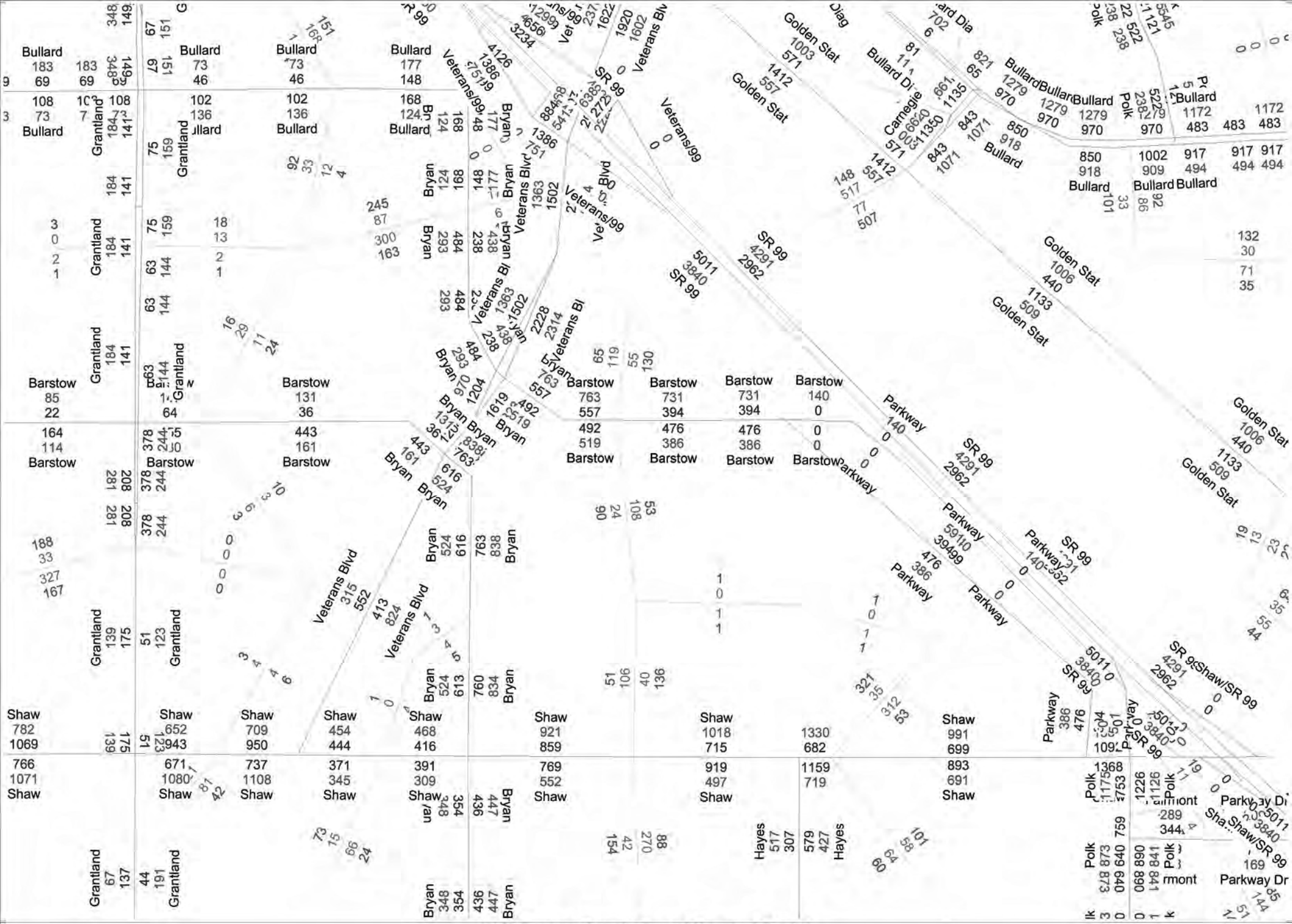
Licensed to Peters Engineering



2019 Fresno County Travel Model
AM and PM Peak Hour Traffic Volumes

cube

Licensed to Peters Engineering



2035 Fresno County Travel Demand Model
AM and PM Peak Hour Traffic Volumes

cube

Licensed to Peters Engineering

Summaries 1726

Person Trips

Purpose	Production	Attractions	Total
Home-Wor	340	0	340
Home-Shop	197	0	197
Home-Othe	1419	298	1717
Work-Othe	0	0	0
Other-Othe	185	185	370
Total Perso	2141	483	2624

Vehicle Trips

Purpose	Production	Attractions	Total
Home-Wor	298	0	298
Home-Shop	136	0	136
Home-Othe	612	128	740
Work-Othe	0	0	0
Other-Othe	109	109	218
Total Vehic	1155	237	1392

Average Tri Time (Minutes)

Home-Wor	19.16
Home-Shop	16.01
Home-Othe	12.57
Work-Othe	?
Other-Othe	11.49
All Trips	13.53

Average Tri Distance (Miles)

Home-Wor	10.31
Home-Shop	9.56
Home-Othe	6.7
Work-Othe	?
Other-Othe	5.78
All Trips	7.25

Select Zone Analysis Request

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

REQUEST FOR SELECT ZONE ANALYSIS

DATE: December 27, 2019

PETERS ENGINEERING GROUP JOB NUMBER: 19-068.01

PROJECT NAME: Proposed Tract 6294

PROJECT DESCRIPTION: The Project is located southeast of the intersection of Grantland and Barstow Avenues in Fresno, California. The Project consists of 55 Chateau Homesites (minimum 50-foot by 100-foot lots) and 130 Summer Homesites (minimum 45-foot by 84-foot lots), for a total of 185 single-family residences. A General Plan Amendment (GPA) will be required to change the land use from Regional Mixed Use allowing between 30 and 45 dwelling units per acre to a different land use allowing the proposed density of approximately 6 to 7 dwelling units per acre. Figure 1, Site Vicinity Map, and Figure 2, Site Plan are attached.

SITE ACREAGE: The Project site covers approximately 29.84 gross acres and 28.00 net acres.

SITE ACCESS LOCATIONS: Site access will be via two local streets connecting to Grantland Avenue. The northern street is proposed approximately opposite the existing San Ramon Avenue, with a new left-turn lane proposed to allow left turns into the site from southbound Grantland Avenue. A median worm would prevent left turns from eastbound and westbound San Ramon Avenue to Grantland Avenue. The southern street is proposed slightly north of the existing San Jose Avenue. There is currently a full median opening with left-turn lanes at San Jose Avenue that would need to be modified to create two different openings with a small median between them. The left-turn lane from southbound Grantland Avenue would be moved to the north. As an alternative, the proposed southern driveway could be aligned with San Jose Avenue to utilize the existing median opening. Future connectivity will be provided for approximately 16 single-family residences that would likely require access through the Project site.

SPECIAL NETWORK INSTRUCTIONS: Create a new TAZ for a year 2040 model run. See the attached Figure 3.

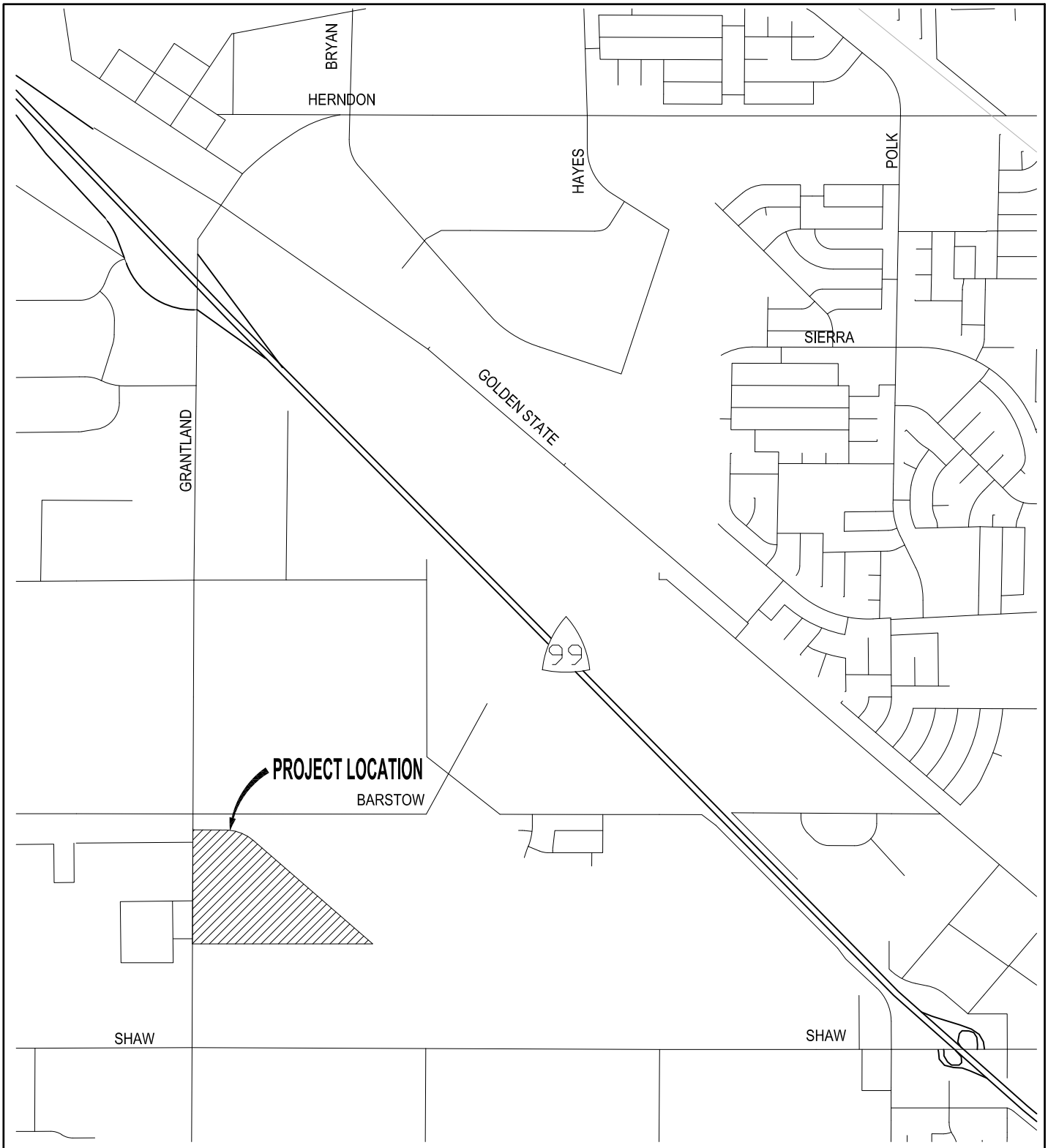
MODELING REQUEST: We are requesting a year 2040 select zone analysis with ITE volumes for the new TAZ and the year 2040 peak hour volumes.

Table 1
Project Trip Generation Estimate

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	185	9.44	1,748	0.74	25:75	34	103	137	0.99	63:37	116	68	184

Reference: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers 2017

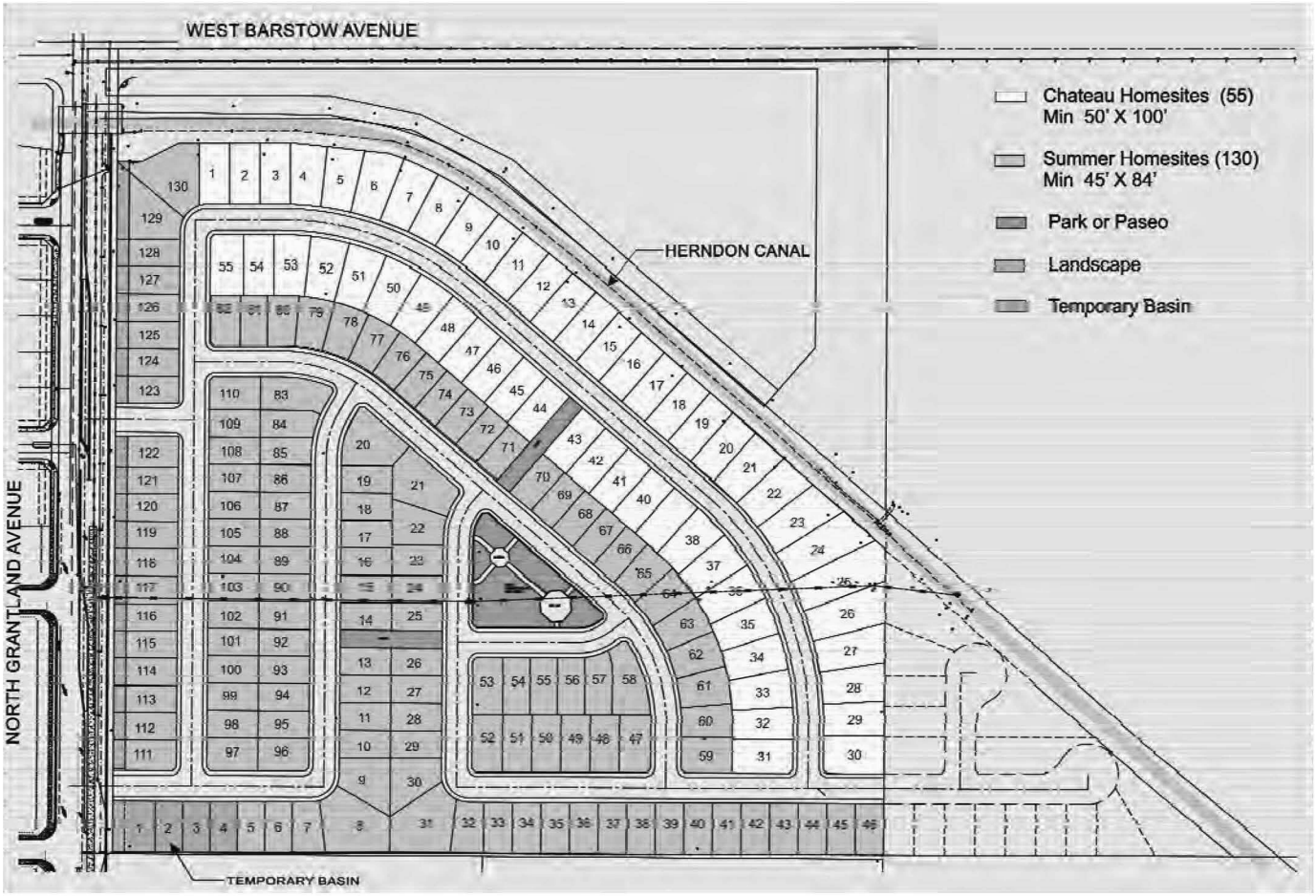
Rates are reported in trips per dwelling unit.



Proposed Tract 6294
Fresno, California

VICINITY MAP

Not to Scale



Proposed Tract 6294
Fresno, California

SITE PLAN

Not to Scale

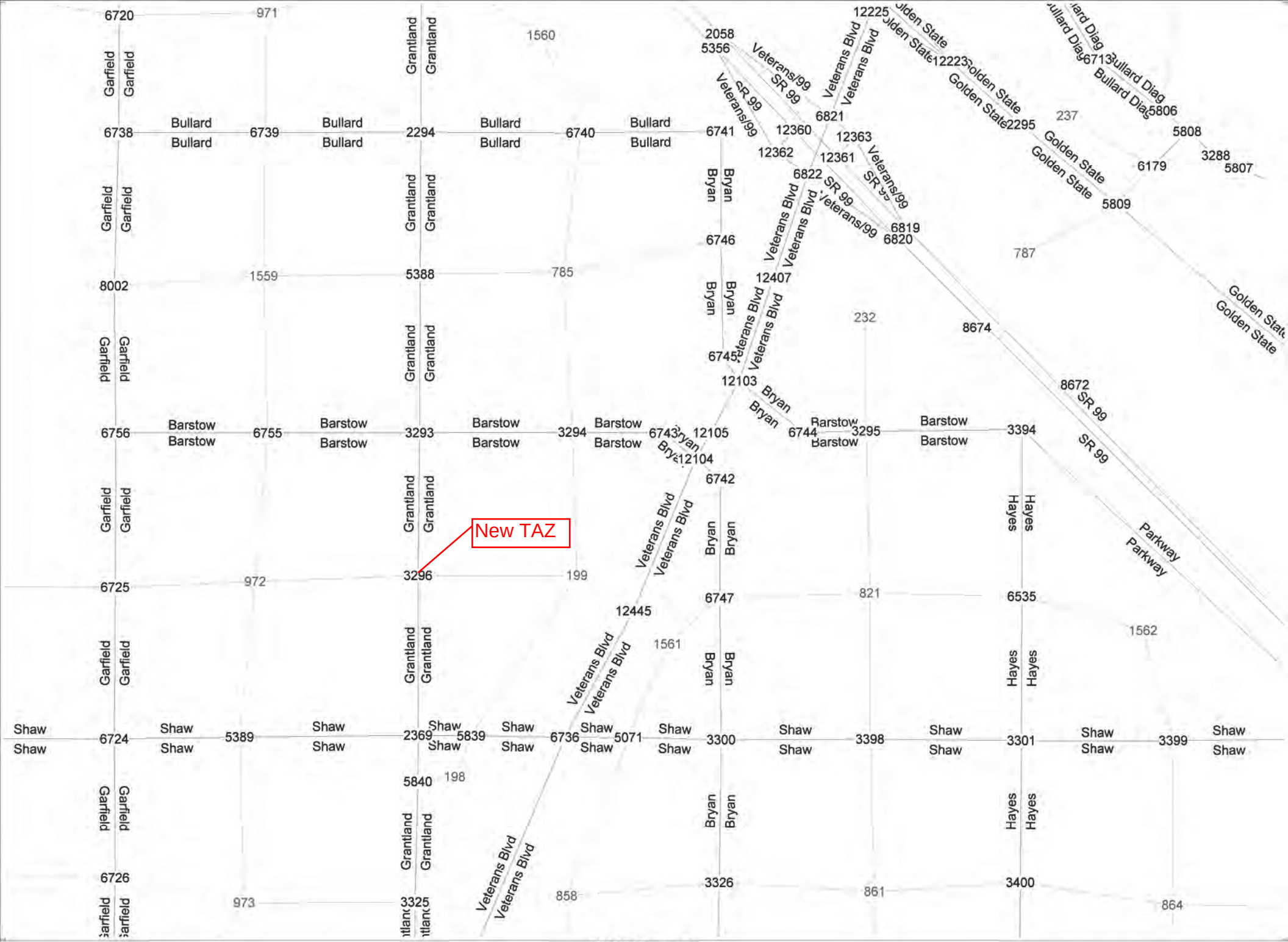


Figure 3

Licensed to Peters Engineering

APPENDIX E
CUMULATIVE PROJECTS

Pending and Approved Entitlements near the Intersection of Barstow Avenue and Grantland Avenue

Record ID	Project Type	Status	Status Date	Application Name	Description of Work	Address
PZ18-30000001	Plan Amendment Rezone	Final Action Letter Complete	05/17/2018	REZONE - PREZONE GETTYSBURG-BRYAN NO. 1	REZONE - PREZONE GETTYSBURG-BRYAN NO. 1	6135 W SHAW AVE FRESNO CA 937239403
PZ18-30000001	Plan Amendment Rezone	Final Action Letter Complete	05/17/2018	REZONE - PREZONE GETTYSBURG-BRYAN NO. 1	REZONE - PREZONE GETTYSBURG-BRYAN NO. 1	6277 W SHAW AVE FRESNO CA 93723
PZ18-30000001	Plan Amendment Rezone	Final Action Letter Complete	05/17/2018	REZONE - PREZONE GETTYSBURG-BRYAN NO. 1	REZONE - PREZONE GETTYSBURG-BRYAN NO. 1	6934 W SHAW AVE FRESNO CA 93723
P18-01067	Development Permit	Final Approval-No Appeal	06/26/2018	Sikh Institute - Phase 2	Single-story addition to the Sikh Institute to complete remaining building construction on the existing concrete foundation	4827 N PARKWAY DR
P18-00608	PreApplication Meeting	Submittal Requirements Sent	06/27/2018	DRC May 31 - Modern Truck Parking	The applicant is proposing to re-stripe the existing parking lot and relocate parking lot lighting.	5249 N CORNELIA AVE
P18-01028	PreApplication Meeting	Submittal Requirements Sent	07/30/2018	DRC July 3rd @ 1:30 p.m. -Highway City Apartments	The applicant is proposing the development of an apartment community that will be a two story, affordable, multi-family housing development located at the address above. The project will consist of a total of 47 units with 10 one bedroom units, and 27 tw	4710 N POLK AVE
PZ18-1000001	Annexation	LAFCO Hearings-Proceedings Com	08/08/2018	ANX - GETTYSBURG-BRYAN NO. 1	ANX - GETTYSBURG-BRYAN NO. 1 ANX - GETTYSBURG-BRYAN NO. 1	6135 W SHAW AVE FRESNO CA 937239403
PZ18-1000001	Annexation	LAFCO Hearings-Proceedings Com	08/08/2018	ANX - GETTYSBURG-BRYAN NO. 1	ANX - GETTYSBURG-BRYAN NO. 1 ANX - GETTYSBURG-BRYAN NO. 1	6277 W SHAW AVE FRESNO CA 93723
PZ18-1000001	Annexation	LAFCO Hearings-Proceedings Com	08/08/2018	ANX - GETTYSBURG-BRYAN NO. 1	ANX - GETTYSBURG-BRYAN NO. 1 ANX - GETTYSBURG-BRYAN NO. 1	6934 W SHAW AVE FRESNO CA 93723
P18-02138	CUP	Final Approval-No Appeal	08/24/2018	Minor Revised CUP for T-5597	Minor Revised CUP (C-05-239) for Tract 5597 - Reduce Rear Yard Setback for Lot 35 of Final Map 6044 to 5' min.	5748 N SAN MIGUEL AVE
P18-02542	PreApplication Meeting	Submittal Requirements Sent	10/30/2018	DRC: Tentative Date/Time: October 2nd at 3:30 pm - Sporting Complex	The applicant proposes to develop two indoor soccer fields and three outdoor soccer fields.	6518 W SHAW AVE
P18-02542	PreApplication Meeting	Submittal Requirements Sent	10/30/2018	DRC: Tentative Date/Time: October 2nd at 3:30 pm - Sporting Complex	The applicant proposes to develop two indoor soccer fields and three outdoor soccer fields.	6556 W SHAW AVE
PZ15-50000009	Tentative Map	NOI Filed with County Clerk	11/26/2018	Westbridge Apartments	Accela record number PZ15-50000009 pertains to Vesting Tentative Parcel map No. 2015-09 proposes the subdivision of an 12.4 acre portion of +/-42.15 acres of property located on the south side of the West Barstow Alignment between North Grantland Avenue	6825 W BARSTOW AVE
P18-03462	PreApplication Meeting	Submittal Requirements Sent	12/05/2018	DRC: ***DATE & TIME SUBJECT TO CHANGE! A CONFIRMATION EMAIL WILL BE SENT*** Date/Time: 12/3/2018 @ 2:00 p.m.	The applicant is proposing to construct a 6-unit detached multi- family townhouse development on a 0.78 acre parcel. The proposed project will have 2,055 square feet of living space, 420 square feet two car garage, 92 square feet porch, and 145 square fo	5240 N STATE ST
P18-03676	PreApplication Meeting	Submittal Requirements Sent	12/17/2018	DRC: ***DATE & TIME SUBJECT TO CHANGE! A CONFIRMATION EMAIL WILL BE SENT*** Date/Time: 12/17/2018 @ 11:00 AM	The applicant proposes to use the subject site to provide access to the adjacent parcel that will lose its access due to HSR. The work will include a drive approach, paving, sidewalk for accessible access and site lighting.	5512 W BARSTOW AVE
P18-03804	PreApplication Meeting	Submittal Requirements Sent	12/21/2018	DRC: ***DATE & TIME SUBJECT TO CHANGE! A CONFIRMATION EMAIL WILL BE SENT*** Date/Time: 1/3/2019 @ 10:00 am	Accela application number P18-03804 pertains to the conversion of a vacant lot into a transient commercial truck/fleet parking terminal. The proposed truck parking will be gated, fenced, paved and shall be well lit to accommodate 132 trucks.	4951 W JACQUELYN AVE
P18-02936	CUP	Approved w/Cond.- No Appeal	01/05/2019	Fresno Fire Station No. 18	Construction of Fresno Fire Station No. 18 located on a 1.68-acre undeveloped parcel owned by the City of Fresno	6605 W SHAW AVE
P18-00918	PreApplication Meeting	Final Review	01/23/2019	DRC Jun 26th - Starbucks w/Drive-Thru	Proposal to develop a 2,100 square foot building with a drive thru and a 400 square foot outdoor patio area located on a .45 acre partially vacant parcel (19,800 net usable square feet).	5211 W SHAW AVE
PZ18-80000039	CUP	Approval Letter Issued	03/15/2019	CUP - NEW JACK-IN-THE-BOX RESTAURANT W/DRIVE-THRU (SEE ALSO C-14-087)	CUP - NEW JACK-IN-THE-BOX RESTAURANT W/DRIVE-THRU (SEE ALSO C-14-087)	5325 W SHAW AVE FRESNO CA 93722
P19-00975	PreApplication Meeting	Submittal Requirements Sent	03/18/2019	Shaw Multi-Family Residential DRC: ***DATE & TIME SUBJECT TO CHANGE! A CONFIRMATION EMAIL WILL BE SENT*** Date/Time: 3/25/2019 @ 2:00 pm	The proposed is a four-floor, multi-family residential project that includes 24 new units. There is proposed to be a variety of bedroom and bathroom counts.	5717 W SHAW AVE
PZ15-80000165	CUP	Approval Letter Issued	03/19/2019	Westbridge Apartments	Accela record number PZ15-80000165 pertains to Conditional Use Permit Application No. C-15-165 pertains to approximately 12.4 acres of property located approximately 650 feet west of the southwesterly corner of Veterans Boulevard and Barstow Avenue. The	6825 W BARSTOW AVE FRESNO CA 937239367
P18-03246	CUP	Approved w/Cond.- No Appeal	04/30/2019	New building construction for Starbucks Coffee Company in Highway City Neighborhood	Construction of a 2,100 square-foot building with a drive through service window and a 400 square-foot outdoor dining patio for Starbucks Coffee Company	5211 W SHAW AVE
P19-02644	Development Permit	Final Approval-No Appeal	06/06/2019	File Stuffer - Larger Roll Up Door	Proposing a larger 14' x 11' roll up door on an existing building.	4697 W JACQUELYN AVE
P19-03441	PreApplication Meeting	Submittal Requirements Sent	08/07/2019	Johnny Quik/Chevron Gas Station DRC: ***DATE & TIME SUBJECT TO CHANGE! A CONFIRMATION EMAIL WILL BE SENT*** Date/Time: TBA	The project proposes to construct a 2,983 sf convenience market and gas station with 8 fueling pumps. The project also proposes to construct a 700 sf restaurant with drive thru and 1,500 sf retail building, on approximately 1.26 acres. The proposed proj	6940 W BARSTOW AVE
P19-02037	CUP	Categorical Exemption Complete	08/20/2019	6-unit townhouse 5240 N. STATE STREET	Conditional Use Permit Application No. P19-02037 was filed by Mike De Alba of De Alba Architects and pertains to .78 acres located at 5240 N. State St. The applicant proposes the construction of new 6-unit detached townhouses. The area is currently zoned	5240 N STATE ST
P19-00400	Development Permit	Approve w/Conditions-No Appeal	08/22/2019	Commercial Truck Parking Lot for Toor Trucking	Development Permit Application P19-00400 was filed by Eric Zamora of MEC and Associates Development Permit and pertains to 9.93 acres of vacant property in the existing Shaw Gates Industrial Park located at 4936 and 4951 W Jacquelyn Avenue, just north	4951 W JACQUELYN AVE
P19-03631	Development Permit	In Review	09/04/2019	Proposed Paved Access Driveway	Development Permit Application No. P19-03631 was filed by James Quinn of Associated Design and Engineering, Inc. and pertains to 1.41 acres located at the northeast corner of North Golden State Boulevard and West Barstow Avenue. The applicant proposes a	5512 W BARSTOW AVE
P19-04815	Development Permit	Final Approval-No Appeal	10/16/2019	File Stuffer - Removing Existing Door	Removing an existing door from the Highway City Community Center for an interior remodel. The related building application is B19-08582.	5140 N STATE ST
P19-04910	CUP	Approved	12/20/2019	C/T Modifications Highway City 850	Conditional Use Permit Application No. P19-04910 was filed by Roger Roach of Epic Wireless and pertains to the 1.38 acres located at 4880 W. Jacquelyn Ave. The applicant proposes replace (11) existing antennas with (12) new antennas, replace (13) existin	4880 W JACQUELYN AVE
P19-04594	CUP	In Review	12/24/2019	Johnny Quik - Barstow/Grantland - ABCUP	Development Permit Application No. P19-04594 was filed by Ken Vang of Vang Incorporated Consulting Engineers and pertains to the parcel (505-281-18) located at 6940 W. Barstow. The applicant proposes to construct a 2,982 sq. ft. Johnny Quik Food Store wi	6940 W BARSTOW AVE
P19-04593	CUP	In Review	01/21/2020	Johnny Quik - Barstow/Grantland - Drive-thru CUP	Conditional Use Permit Application No. P19-04593 was filed by Ken Vang of Vang Incorporated Consulting Engineers and pertains to the parcel (505-281-18) located at 6940 W. Barstow. The applicant proposes to construct a 2,982 sq. ft. Johnny Quik Food Stor	6940 W BARSTOW AVE

APPENDIX F
INTERSECTION ANALYSIS SHEETS

Operational Analyses

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	2	8	6	7	222	5	442	4	104	308	18
Future Vol, veh/h	22	2	8	6	7	222	5	442	4	104	308	18
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	1	-	0	270	-	200	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	26	2	9	7	8	258	6	514	5	121	358	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	894	1152	379	1152	1157	267	384	0	0	524	0	0
Stage 1	616	616	-	531	531	-	-	-	-	-	-	-
Stage 2	278	536	-	621	626	-	-	-	-	-	-	-
Critical Hdwy	7.345	6.545	6.245	7.345	6.545	6.945	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	6.145	5.545	-	6.545	5.545	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.545	5.545	-	6.145	5.545	-	-	-	-	-	-	-
Follow-up Hdwy	3.5285	4.0285	3.3285	3.5285	4.0285	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	247	196	664	162	194	729	1166	-	-	1035	-	-
Stage 1	475	479	-	498	523	-	-	-	-	-	-	-
Stage 2	703	520	-	472	474	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	137	171	658	142	169	722	1160	-	-	1030	-	-
Mov Cap-2 Maneuver	137	171	-	142	169	-	-	-	-	-	-	-
Stage 1	470	421	-	493	518	-	-	-	-	-	-	-
Stage 2	440	515	-	406	417	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.9	13.6	0.1	2.2
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1160	-	-	137	419	142	169	722	1030	-	-
HCM Lane V/C Ratio	0.005	-	-	0.187	0.028	0.049	0.048	0.358	0.117	-	-
HCM Control Delay (s)	8.1	-	-	37.2	13.8	31.7	27.4	12.7	9	-	-
HCM Lane LOS	A	-	-	E	B	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	0.2	0.2	1.6	0.4	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	21	14	44	19	14	11	16	282	10	18	278	9
Future Vol, veh/h	21	14	44	19	14	11	16	282	10	18	278	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	24	16	49	21	16	12	18	317	11	20	312	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	740	731	327	759	731	333	327	0	0	333	0	0
Stage 1	362	362	-	364	364	-	-	-	-	-	-	-
Stage 2	378	369	-	395	367	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	331	348	712	322	348	706	1227	-	-	1221	-	-
Stage 1	655	623	-	653	622	-	-	-	-	-	-	-
Stage 2	642	619	-	628	620	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	303	334	705	279	334	699	1221	-	-	1215	-	-
Mov Cap-2 Maneuver	303	334	-	279	334	-	-	-	-	-	-	-
Stage 1	643	610	-	641	610	-	-	-	-	-	-	-
Stage 2	602	607	-	557	607	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	17	0.4	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1221	-	-	455	350	1215	-	-
HCM Lane V/C Ratio	0.015	-	-	0.195	0.141	0.017	-	-
HCM Control Delay (s)	8	-	-	14.8	17	8	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	39	9	298	364	6
Future Vol, veh/h	0	39	9	298	364	6
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	47	11	359	439	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	233	451	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.945	4.145	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	0	767	1102	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	760	1097	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1097	-	760	-	-
HCM Lane V/C Ratio	0.01	-	0.062	-	-
HCM Control Delay (s)	8.3	-	10	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Traffic Vol, veh/h	25	1	36	1	1	1	13	257	3	26	389	5
Future Vol, veh/h	25	1	36	1	1	1	13	257	3	26	389	5
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	29	1	42	1	1	1	15	302	4	31	458	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	868	869	471	889	870	314	469	0	0	311	0	0
Stage 1	528	528	-	339	339	-	-	-	-	-	-	-
Stage 2	340	341	-	550	531	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	272	289	591	263	289	724	1087	-	-	1244	-	-
Stage 1	532	526	-	673	638	-	-	-	-	-	-	-
Stage 2	673	637	-	518	524	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	260	275	585	234	275	717	1082	-	-	1238	-	-
Mov Cap-2 Maneuver	260	275	-	234	275	-	-	-	-	-	-	-
Stage 1	522	510	-	660	626	-	-	-	-	-	-	-
Stage 2	658	625	-	465	508	-	-	-	-	-	-	-

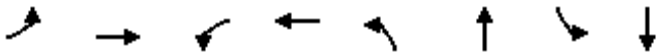
Approach	EB	WB	NB	SB
HCM Control Delay, s	16.6	16.3	0.4	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	384	322	1238	-	-
HCM Lane V/C Ratio	0.014	-	-	0.19	0.011	0.025	-	-
HCM Control Delay (s)	8.4	-	-	16.6	16.3	8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	244	15	22	185	79	22	141	42	154	189	85
Future Volume (veh/h)	69	244	15	22	185	79	22	141	42	154	189	85
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		0.97	1.00		0.98	1.00		0.98	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	76	268	16	24	203	87	24	155	46	169	208	93
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	113	494	30	49	306	131	49	273	81	221	357	160
Arrive On Green	0.06	0.29	0.29	0.03	0.25	0.25	0.03	0.20	0.20	0.13	0.30	0.30
Sat Flow, veh/h	1740	1703	102	1740	1205	517	1740	1345	399	1740	1183	529
Grp Volume(v), veh/h	76	0	284	24	0	290	24	0	201	169	0	301
Grp Sat Flow(s),veh/h/ln	1740	0	1805	1740	0	1722	1740	0	1745	1740	0	1712
Q Serve(g_s), s	2.2	0.0	6.7	0.7	0.0	7.7	0.7	0.0	5.3	4.8	0.0	7.5
Cycle Q Clear(g_c), s	2.2	0.0	6.7	0.7	0.0	7.7	0.7	0.0	5.3	4.8	0.0	7.5
Prop In Lane	1.00		0.06	1.00		0.30	1.00		0.23	1.00		0.31
Lane Grp Cap(c), veh/h	113	0	524	49	0	437	49	0	355	221	0	517
V/C Ratio(X)	0.67	0.00	0.54	0.49	0.00	0.66	0.49	0.00	0.57	0.77	0.00	0.58
Avail Cap(c_a), veh/h	343	0	1108	206	0	921	206	0	795	652	0	1219
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	23.2	0.0	15.1	24.3	0.0	17.0	24.3	0.0	18.2	21.4	0.0	15.0
Incr Delay (d2), s/veh	6.8	0.0	0.9	7.3	0.0	1.7	7.3	0.0	1.4	5.5	0.0	1.0
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	1.2	0.0	3.4	0.4	0.0	3.8	0.4	0.0	2.7	2.6	0.0	3.7
LnGrp Delay(d),s/veh	30.0	0.0	16.0	31.5	0.0	18.7	31.5	0.0	19.6	26.9	0.0	16.0
LnGrp LOS	C		B	C		B	C		B	C		B
Approach Vol, veh/h		360			314			225			470	
Approach Delay, s/veh		19.0			19.7			20.9			19.9	
Approach LOS		B			B			C			B	

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	10.4	15.2	5.4	19.6	5.4	20.2	7.3	17.8
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	19.0	23.1	6.0	31.1	6.0	36.1	10.0	27.1
Max Q Clear Time (g_c+I1), s	6.8	7.3	2.7	8.7	2.7	9.5	4.2	9.7
Green Ext Time (p_c), s	0.3	2.5	0.0	3.0	0.0	2.9	0.1	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	19.8
HCM 2010 LOS	B



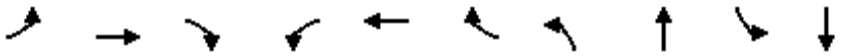
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	284	24	290	24	201	169	301
v/c Ratio	0.31	0.43	0.13	0.61	0.13	0.51	0.48	0.47
Control Delay	37.2	21.7	38.8	29.3	38.8	31.1	34.1	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	21.7	38.8	29.3	38.8	31.1	34.1	19.8
Queue Length 50th (ft)	30	77	9	101	9	71	65	74
Queue Length 95th (ft)	89	212	40	222	40	169	156	203
Internal Link Dist (ft)		2439		7910		2074		1196
Turn Bay Length (ft)	350		350		200		170	
Base Capacity (vph)	325	981	195	874	195	767	617	1039
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.29	0.12	0.33	0.12	0.26	0.27	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	479	40	195	349	51	29	29	334	181	24	6
Future Volume (veh/h)	7	479	40	195	349	51	29	29	334	181	24	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		0.92	1.00		0.94	1.00		0.96	1.00		0.95
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	7	510	43	207	371	54	31	31	355	193	26	6
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	16	735	302	249	632	506	54	35	399	235	554	128
Arrive On Green	0.01	0.21	0.21	0.14	0.35	0.35	0.03	0.29	0.29	0.13	0.39	0.39
Sat Flow, veh/h	1740	3471	1424	1740	1827	1462	1740	122	1392	1740	1419	328
Grp Volume(v), veh/h	7	510	43	207	371	54	31	0	386	193	0	32
Grp Sat Flow(s),veh/h/ln	1740	1736	1424	1740	1827	1462	1740	0	1513	1740	0	1747
Q Serve(g_s), s	0.3	10.8	2.0	9.2	13.3	2.0	1.4	0.0	19.5	8.6	0.0	0.9
Cycle Q Clear(g_c), s	0.3	10.8	2.0	9.2	13.3	2.0	1.4	0.0	19.5	8.6	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.92	1.00		0.19
Lane Grp Cap(c), veh/h	16	735	302	249	632	506	54	0	433	235	0	682
V/C Ratio(X)	0.45	0.69	0.14	0.83	0.59	0.11	0.57	0.00	0.89	0.82	0.00	0.05
Avail Cap(c_a), veh/h	131	920	377	415	782	626	135	0	515	393	0	853
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.3	29.0	25.5	33.2	21.4	17.7	38.0	0.0	27.2	33.5	0.0	15.1
Incr Delay (d2), s/veh	18.6	1.7	0.2	7.0	0.9	0.1	9.1	0.0	15.6	7.0	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	0.2	5.3	0.8	4.9	6.9	0.8	0.8	0.0	10.0	4.6	0.0	0.4
LnGrp Delay(d),s/veh	57.9	30.7	25.7	40.1	22.2	17.8	47.2	0.0	42.8	40.6	0.0	15.1
LnGrp LOS	E	C	C	D	C	B	D		D	D		B
Approach Vol, veh/h		560			632			417			225	
Approach Delay, s/veh		30.6			27.7			43.1			36.9	
Approach LOS		C			C			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	27.7	15.4	21.8	6.5	36.0	4.7	32.5
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	18.0	27.1	19.0	21.1	6.2	38.9	6.0	34.1
Max Q Clear Time (g_c+I1), s	10.6	21.5	11.2	12.8	3.4	2.9	2.3	15.3
Green Ext Time (p_c), s	0.3	1.4	0.3	3.4	0.0	3.3	0.0	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	510	43	207	371	54	31	386	193	32
v/c Ratio	0.05	0.65	0.09	0.62	0.44	0.07	0.21	0.76	0.60	0.05
Control Delay	40.0	31.7	0.4	38.2	18.1	0.2	41.4	16.0	38.5	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	31.7	0.4	38.2	18.1	0.2	41.4	16.0	38.5	18.0
Queue Length 50th (ft)	3	103	0	80	93	0	13	12	75	7
Queue Length 95th (ft)	19	208	0	193	278	0	48	104	183	31
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	152	1074	566	484	948	807	157	809	458	999
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.47	0.08	0.43	0.39	0.07	0.20	0.48	0.42	0.03

Intersection Summary

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	2	5	10	5	101	9	370	8	121	446	17
Future Vol, veh/h	15	2	5	10	5	101	9	370	8	121	446	17
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	1	-	0	270	-	200	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	16	2	5	11	5	110	10	402	9	132	485	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	992	1199	504	1194	1199	211	508	0	0	416	0	0
Stage 1	763	763	-	427	427	-	-	-	-	-	-	-
Stage 2	229	436	-	767	772	-	-	-	-	-	-	-
Critical Hdwy	7.345	6.545	6.245	7.345	6.545	6.945	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	6.145	5.545	-	6.545	5.545	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.545	5.545	-	6.145	5.545	-	-	-	-	-	-	-
Follow-up Hdwy	3.5285	4.0285	3.3285	3.5285	4.0285	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	211	184	564	151	184	792	1049	-	-	1135	-	-
Stage 1	394	410	-	574	582	-	-	-	-	-	-	-
Stage 2	751	577	-	392	406	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	158	159	559	133	159	784	1044	-	-	1130	-	-
Mov Cap-2 Maneuver	158	159	-	133	159	-	-	-	-	-	-	-
Stage 1	388	360	-	566	573	-	-	-	-	-	-	-
Stage 2	631	568	-	339	357	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.9	13.2	0.2	1.8
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1044	-	-	158	325	133	159	784	1130	-	-
HCM Lane V/C Ratio	0.009	-	-	0.103	0.023	0.082	0.034	0.14	0.116	-	-
HCM Control Delay (s)	8.5	-	-	30.4	16.3	34.5	28.4	10.3	8.6	-	-
HCM Lane LOS	A	-	-	D	C	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.3	0.1	0.5	0.4	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	21	8	23	19	14	15	34	288	21	25	352	24
Future Vol, veh/h	21	8	23	19	14	15	34	288	21	25	352	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	8	23	19	14	15	34	291	21	25	356	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	812	808	378	814	810	312	385	0	0	317	0	0
Stage 1	423	423	-	375	375	-	-	-	-	-	-	-
Stage 2	389	385	-	439	435	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	296	314	667	295	313	726	1168	-	-	1237	-	-
Stage 1	607	586	-	644	615	-	-	-	-	-	-	-
Stage 2	633	609	-	595	579	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	266	296	661	266	295	719	1162	-	-	1231	-	-
Mov Cap-2 Maneuver	266	296	-	266	295	-	-	-	-	-	-	-
Stage 1	586	571	-	622	594	-	-	-	-	-	-	-
Stage 2	584	588	-	552	565	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.4	17.2	0.8	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1162	-	-	369	343	1231	-	-
HCM Lane V/C Ratio	0.03	-	-	0.142	0.141	0.021	-	-
HCM Control Delay (s)	8.2	-	-	16.4	17.2	8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	31	37	345	328	21
Future Vol, veh/h	0	31	37	345	328	21
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	32	39	359	342	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	192	369	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.945	4.145	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	0	815	1181	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	807	1175	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1175	-	807	-	-
HCM Lane V/C Ratio	0.033	-	0.04	-	-
HCM Control Delay (s)	8.2	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Traffic Vol, veh/h	19	1	27	1	1	1	42	339	1	22	309	24
Future Vol, veh/h	19	1	27	1	1	1	42	339	1	22	309	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	20	1	28	1	1	1	44	353	1	23	322	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	834	833	345	847	845	364	352	0	0	359	0	0
Stage 1	386	386	-	447	447	-	-	-	-	-	-	-
Stage 2	448	447	-	400	398	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	286	303	696	281	298	679	1201	-	-	1194	-	-
Stage 1	635	608	-	589	572	-	-	-	-	-	-	-
Stage 2	588	572	-	624	601	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	270	283	689	255	279	673	1195	-	-	1188	-	-
Mov Cap-2 Maneuver	270	283	-	255	279	-	-	-	-	-	-	-
Stage 1	609	593	-	565	548	-	-	-	-	-	-	-
Stage 2	562	548	-	583	587	-	-	-	-	-	-	-

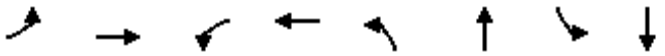
Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	15.9	0.9	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	416	334	1188	-	-
HCM Lane V/C Ratio	0.037	-	-	0.118	0.009	0.019	-	-
HCM Control Delay (s)	8.1	-	-	14.8	15.9	8.1	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	195	21	34	260	114	13	150	33	123	161	73
Future Volume (veh/h)	82	195	21	34	260	114	13	150	33	123	161	73
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		0.97	1.00		0.98	1.00		0.97	1.00		0.96
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	88	210	23	37	280	123	14	161	35	132	173	78
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	119	550	60	69	374	164	31	271	59	172	316	143
Arrive On Green	0.07	0.34	0.34	0.04	0.31	0.31	0.02	0.19	0.19	0.10	0.27	0.27
Sat Flow, veh/h	1740	1612	177	1740	1196	525	1740	1447	315	1740	1178	531
Grp Volume(v), veh/h	88	0	233	37	0	403	14	0	196	132	0	251
Grp Sat Flow(s),veh/h/ln	1740	0	1789	1740	0	1721	1740	0	1762	1740	0	1710
Q Serve(g_s), s	2.7	0.0	5.3	1.1	0.0	11.2	0.4	0.0	5.4	4.0	0.0	6.7
Cycle Q Clear(g_c), s	2.7	0.0	5.3	1.1	0.0	11.2	0.4	0.0	5.4	4.0	0.0	6.7
Prop In Lane	1.00		0.10	1.00		0.31	1.00		0.18	1.00		0.31
Lane Grp Cap(c), veh/h	119	0	611	69	0	538	31	0	330	172	0	459
V/C Ratio(X)	0.74	0.00	0.38	0.54	0.00	0.75	0.46	0.00	0.59	0.77	0.00	0.55
Avail Cap(c_a), veh/h	352	0	1259	212	0	1073	195	0	656	495	0	931
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	24.4	0.0	13.3	25.2	0.0	16.5	26.0	0.0	19.9	23.5	0.0	16.8
Incr Delay (d2), s/veh	8.7	0.0	0.4	6.4	0.0	2.1	10.3	0.0	1.7	7.0	0.0	1.0
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	1.6	0.0	2.7	0.7	0.0	5.6	0.3	0.0	2.8	2.2	0.0	3.3
LnGrp Delay(d),s/veh	33.2	0.0	13.7	31.6	0.0	18.6	36.3	0.0	21.6	30.5	0.0	17.8
LnGrp LOS	C		B	C		B	D		C	C		B
Approach Vol, veh/h		321			440			210			383	
Approach Delay, s/veh		19.0			19.7			22.6			22.2	
Approach LOS		B			B			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	9.3	14.9	6.1	23.1	4.9	19.2	7.6	21.6
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	15.2	19.9	6.5	37.6	6.0	29.1	10.8	33.3
Max Q Clear Time (g_c+I1), s	6.0	7.4	3.1	7.3	2.4	8.7	4.7	13.2
Green Ext Time (p_c), s	0.2	1.9	0.0	3.7	0.0	2.3	0.1	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C



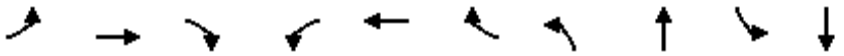
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	88	233	37	403	14	196	132	251
v/c Ratio	0.36	0.33	0.20	0.70	0.08	0.53	0.45	0.41
Control Delay	39.7	19.2	41.2	30.0	40.8	34.8	38.2	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	19.2	41.2	30.0	40.8	34.8	38.2	20.6
Queue Length 50th (ft)	38	77	16	155	6	78	56	71
Queue Length 95th (ft)	101	156	54	302	28	173	134	188
Internal Link Dist (ft)		2439		7910		2074		1196
Turn Bay Length (ft)	350		350		200		170	
Base Capacity (vph)	330	1056	199	951	183	627	465	893
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.22	0.19	0.42	0.08	0.31	0.28	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	425	46	320	545	255	21	37	264	139	58	14
Future Volume (veh/h)	6	425	46	320	545	255	21	37	264	139	58	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		0.92	1.00		0.95	1.00		0.95	1.00		0.94
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	6	447	48	337	574	268	22	39	278	146	61	15
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	14	727	298	385	773	623	42	45	320	182	448	110
Arrive On Green	0.01	0.21	0.21	0.22	0.42	0.42	0.02	0.24	0.24	0.10	0.32	0.32
Sat Flow, veh/h	1740	3471	1423	1740	1827	1473	1740	187	1331	1740	1396	343
Grp Volume(v), veh/h	6	447	48	337	574	268	22	0	317	146	0	76
Grp Sat Flow(s),veh/h/ln	1740	1736	1423	1740	1827	1473	1740	0	1518	1740	0	1740
Q Serve(g_s), s	0.3	9.3	2.2	14.9	21.0	10.2	1.0	0.0	15.9	6.5	0.0	2.5
Cycle Q Clear(g_c), s	0.3	9.3	2.2	14.9	21.0	10.2	1.0	0.0	15.9	6.5	0.0	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.88	1.00		0.20
Lane Grp Cap(c), veh/h	14	727	298	385	773	623	42	0	364	182	0	558
V/C Ratio(X)	0.44	0.61	0.16	0.87	0.74	0.43	0.52	0.00	0.87	0.80	0.00	0.14
Avail Cap(c_a), veh/h	129	878	360	613	971	782	129	0	441	307	0	683
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.2	28.5	25.7	29.9	19.3	16.2	38.3	0.0	29.0	34.7	0.0	19.2
Incr Delay (d2), s/veh	20.9	0.9	0.3	8.3	2.4	0.5	9.7	0.0	14.7	7.9	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	4.5	0.9	8.0	11.0	4.2	0.6	0.0	8.2	3.5	0.0	1.2
LnGrp Delay(d),s/veh	60.2	29.4	25.9	38.2	21.6	16.6	48.0	0.0	43.7	42.6	0.0	19.3
LnGrp LOS	E	C	C	D	C	B	D		D	D		B
Approach Vol, veh/h		501			1179			339			222	
Approach Delay, s/veh		29.4			25.2			44.0			34.6	
Approach LOS		C			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	12.3	24.0	21.6	21.5	5.9	30.4	4.6	38.5
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	14.0	23.1	28.0	20.1	5.9	31.2	5.9	42.2
Max Q Clear Time (g_c+I1), s	8.5	17.9	16.9	11.3	3.0	4.5	2.3	23.0
Green Ext Time (p_c), s	0.2	1.1	0.7	4.6	0.0	2.8	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	29.9
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	6	447	48	337	574	268	22	317	146	76
v/c Ratio	0.04	0.63	0.11	0.74	0.62	0.32	0.16	0.73	0.56	0.15
Control Delay	41.5	33.5	0.5	37.4	18.9	3.8	42.8	17.8	42.2	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.5	33.5	0.5	37.4	18.9	3.8	42.8	17.8	42.2	21.9
Queue Length 50th (ft)	3	97	0	137	162	4	9	17	61	20
Queue Length 95th (ft)	17	189	0	288	429	54	39	105	152	67
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	144	985	535	686	1114	964	144	679	343	773
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.45	0.09	0.49	0.52	0.28	0.15	0.47	0.43	0.10

Intersection Summary

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	2	8	6	7	222	5	502	4	104	322	18
Future Vol, veh/h	22	2	8	6	7	222	5	502	4	104	322	18
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	1	-	0	270	-	200	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	26	2	9	7	8	258	6	584	5	121	374	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	945	1238	395	1238	1243	302	400	0	0	594	0	0
Stage 1	632	632	-	601	601	-	-	-	-	-	-	-
Stage 2	313	606	-	637	642	-	-	-	-	-	-	-
Critical Hdwy	7.345	6.545	6.245	7.345	6.545	6.945	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	6.145	5.545	-	6.545	5.545	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.545	5.545	-	6.145	5.545	-	-	-	-	-	-	-
Follow-up Hdwy	3.5285	4.0285	3.3285	3.5285	4.0285	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	228	174	651	141	173	692	1151	-	-	974	-	-
Stage 1	465	471	-	453	486	-	-	-	-	-	-	-
Stage 2	671	484	-	462	466	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	122	150	645	123	149	685	1146	-	-	969	-	-
Mov Cap-2 Maneuver	122	150	-	123	149	-	-	-	-	-	-	-
Stage 1	460	410	-	448	481	-	-	-	-	-	-	-
Stage 2	407	479	-	394	406	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.5	14.5	0.1	2.2
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	122	389	123	149	685	969	-	-
HCM Lane V/C Ratio	0.005	-	-	0.21	0.03	0.057	0.055	0.377	0.125	-	-
HCM Control Delay (s)	8.2	-	-	42.2	14.5	36	30.6	13.4	9.2	-	-
HCM Lane LOS	A	-	-	E	B	E	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	0.2	0.2	1.8	0.4	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑		↰	↑	
Traffic Vol, veh/h	21	14	44	26	14	11	17	342	37	18	292	9
Future Vol, veh/h	21	14	44	26	14	11	17	342	37	18	292	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	24	16	49	29	16	12	19	384	42	20	328	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	840	847	343	859	831	415	343	0	0	431	0	0
Stage 1	378	378	-	448	448	-	-	-	-	-	-	-
Stage 2	462	469	-	411	383	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	284	298	697	275	304	635	1210	-	-	1123	-	-
Stage 1	642	613	-	588	571	-	-	-	-	-	-	-
Stage 2	578	559	-	616	610	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	258	285	690	236	291	629	1204	-	-	1118	-	-
Mov Cap-2 Maneuver	258	285	-	236	291	-	-	-	-	-	-	-
Stage 1	629	599	-	576	559	-	-	-	-	-	-	-
Stage 2	539	547	-	544	596	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	20.4	0.3	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1204	-	-	407	290	1118	-	-
HCM Lane V/C Ratio	0.016	-	-	0.218	0.198	0.018	-	-
HCM Control Delay (s)	8	-	-	16.3	20.4	8.3	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.7	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	39	0	0	53	56	333	6	13	372	6
Future Vol, veh/h	0	0	39	0	0	53	56	333	6	13	372	6
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	92	83	92	92	92	83	83	92	92	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	47	0	0	58	67	401	7	14	448	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	238	-	-	405	460	0	0	408	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	761	0	0	642	1093	-	-	1143	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	754	-	-	642	1088	-	-	1143	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	11.2	1.2	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1088	-	-	754	642	1143	-	-
HCM Lane V/C Ratio	0.062	-	-	0.062	0.09	0.012	-	-
HCM Control Delay (s)	8.5	-	-	10.1	11.2	8.2	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	25	1	36	1	1	1	13	269	3	34	436	5
Future Vol, veh/h	25	1	36	1	1	1	13	269	3	34	436	5
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	29	1	42	1	1	1	15	316	4	40	513	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	955	956	526	976	957	328	524	0	0	325	0	0
Stage 1	601	601	-	353	353	-	-	-	-	-	-	-
Stage 2	354	355	-	623	604	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	237	257	550	229	257	711	1038	-	-	1229	-	-
Stage 1	485	488	-	662	629	-	-	-	-	-	-	-
Stage 2	661	628	-	472	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	225	242	545	201	242	704	1033	-	-	1223	-	-
Mov Cap-2 Maneuver	225	242	-	201	242	-	-	-	-	-	-	-
Stage 1	476	469	-	649	616	-	-	-	-	-	-	-
Stage 2	646	615	-	418	468	-	-	-	-	-	-	-

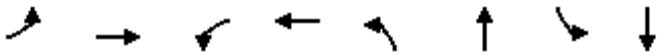
Approach	EB	WB	NB	SB
HCM Control Delay, s	18.4	17.8	0.4	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1033	-	-	342	285	1223	-	-
HCM Lane V/C Ratio	0.015	-	-	0.213	0.012	0.033	-	-
HCM Control Delay (s)	8.5	-	-	18.4	17.8	8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	244	15	22	185	84	22	146	42	174	209	92
Future Volume (veh/h)	71	244	15	22	185	84	22	146	42	174	209	92
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		0.97	1.00		0.98	1.00		0.98	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	78	268	16	24	203	92	24	160	46	191	230	101
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	112	493	29	49	299	135	49	278	80	246	379	166
Arrive On Green	0.06	0.29	0.29	0.03	0.25	0.25	0.03	0.20	0.20	0.14	0.32	0.32
Sat Flow, veh/h	1740	1703	102	1740	1182	536	1740	1357	390	1740	1191	523
Grp Volume(v), veh/h	78	0	284	24	0	295	24	0	206	191	0	331
Grp Sat Flow(s),veh/h/ln	1740	0	1805	1740	0	1718	1740	0	1747	1740	0	1713
Q Serve(g_s), s	2.3	0.0	7.0	0.7	0.0	8.2	0.7	0.0	5.6	5.6	0.0	8.6
Cycle Q Clear(g_c), s	2.3	0.0	7.0	0.7	0.0	8.2	0.7	0.0	5.6	5.6	0.0	8.6
Prop In Lane	1.00		0.06	1.00		0.31	1.00		0.22	1.00		0.31
Lane Grp Cap(c), veh/h	112	0	522	49	0	434	49	0	358	246	0	545
V/C Ratio(X)	0.70	0.00	0.54	0.49	0.00	0.68	0.49	0.00	0.58	0.78	0.00	0.61
Avail Cap(c_a), veh/h	329	0	1061	197	0	880	197	0	763	625	0	1169
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	24.2	0.0	15.9	25.3	0.0	17.8	25.3	0.0	19.0	21.9	0.0	15.2
Incr Delay (d2), s/veh	7.5	0.0	0.9	7.4	0.0	1.9	7.4	0.0	1.5	5.2	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	1.3	0.0	3.6	0.4	0.0	4.1	0.4	0.0	2.8	3.0	0.0	4.2
LnGrp Delay(d),s/veh	31.7	0.0	16.7	32.8	0.0	19.7	32.8	0.0	20.4	27.1	0.0	16.3
LnGrp LOS	C		B	C		B	C		C	C		B
Approach Vol, veh/h		362			319			230			522	
Approach Delay, s/veh		20.0			20.7			21.7			20.3	
Approach LOS		B			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	11.5	15.7	5.5	20.2	5.5	21.7	7.4	18.3
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	19.0	23.1	6.0	31.1	6.0	36.1	10.0	27.1
Max Q Clear Time (g_c+I1), s	7.6	7.6	2.7	9.0	2.7	10.6	4.3	10.2
Green Ext Time (p_c), s	0.4	2.6	0.0	3.1	0.0	3.1	0.1	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C



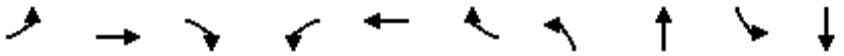
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	78	284	24	295	24	206	191	331
v/c Ratio	0.36	0.46	0.15	0.66	0.15	0.57	0.57	0.46
Control Delay	39.2	22.8	40.0	31.9	40.0	33.5	36.7	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	22.8	40.0	31.9	40.0	33.5	36.7	19.7
Queue Length 50th (ft)	31	80	10	107	10	76	76	86
Queue Length 95th (ft)	91	213	40	227	40	173	176	227
Internal Link Dist (ft)		2439		7910		2074		1196
Turn Bay Length (ft)	350		350		200		170	
Base Capacity (vph)	280	908	168	768	168	663	531	1014
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.31	0.14	0.38	0.14	0.31	0.36	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	499	40	195	354	58	29	29	334	208	24	6
Future Volume (veh/h)	7	499	40	195	354	58	29	29	334	208	24	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		0.92	1.00		0.94	1.00		0.96	1.00		0.95
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	7	531	43	207	377	62	31	31	355	221	26	6
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	16	727	298	248	626	501	53	34	395	262	573	132
Arrive On Green	0.01	0.21	0.21	0.14	0.34	0.34	0.03	0.28	0.28	0.15	0.40	0.40
Sat Flow, veh/h	1740	3471	1423	1740	1827	1461	1740	121	1391	1740	1420	328
Grp Volume(v), veh/h	7	531	43	207	377	62	31	0	386	221	0	32
Grp Sat Flow(s),veh/h/ln	1740	1736	1423	1740	1827	1461	1740	0	1513	1740	0	1747
Q Serve(g_s), s	0.3	11.9	2.0	9.6	14.2	2.4	1.5	0.0	20.4	10.3	0.0	0.9
Cycle Q Clear(g_c), s	0.3	11.9	2.0	9.6	14.2	2.4	1.5	0.0	20.4	10.3	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.92	1.00		0.19
Lane Grp Cap(c), veh/h	16	727	298	248	626	501	53	0	429	262	0	705
V/C Ratio(X)	0.45	0.73	0.14	0.84	0.60	0.12	0.58	0.00	0.90	0.84	0.00	0.05
Avail Cap(c_a), veh/h	126	881	361	398	749	599	130	0	493	377	0	818
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	30.7	26.8	34.7	22.6	18.7	39.8	0.0	28.6	34.4	0.0	15.1
Incr Delay (d2), s/veh	18.8	2.5	0.2	8.3	1.0	0.1	9.5	0.0	17.8	11.3	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	0.2	5.9	0.8	5.2	7.3	1.0	0.8	0.0	10.6	5.7	0.0	0.4
LnGrp Delay(d),s/veh	59.8	33.1	27.0	43.0	23.6	18.9	49.3	0.0	46.5	45.7	0.0	15.1
LnGrp LOS	E	C	C	D	C	B	D		D	D		B
Approach Vol, veh/h		581			646			417			253	
Approach Delay, s/veh		33.0			29.3			46.7			41.8	
Approach LOS		C			C			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	16.5	28.5	15.8	22.3	6.6	38.4	4.7	33.4
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	18.0	27.1	19.0	21.1	6.2	38.9	6.0	34.1
Max Q Clear Time (g_c+I1), s	12.3	22.4	11.6	13.9	3.5	2.9	2.3	16.2
Green Ext Time (p_c), s	0.3	1.2	0.3	3.2	0.0	3.3	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	531	43	207	377	62	31	386	221	32
v/c Ratio	0.05	0.67	0.09	0.63	0.45	0.09	0.21	0.76	0.64	0.05
Control Delay	40.7	32.6	0.4	39.6	18.6	0.2	42.3	16.4	40.0	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	32.6	0.4	39.6	18.6	0.2	42.3	16.4	40.0	18.1
Queue Length 50th (ft)	3	113	0	86	103	0	13	13	91	7
Queue Length 95th (ft)	19	218	0	193	283	0	48	104	#222	31
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	147	1038	554	467	930	794	152	794	443	966
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.51	0.08	0.44	0.41	0.08	0.20	0.49	0.50	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	2	5	10	5	101	9	400	8	121	497	17
Future Vol, veh/h	15	2	5	10	5	101	9	400	8	121	497	17
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	1	-	0	270	-	200	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	16	2	5	11	5	110	10	435	9	132	540	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1063	1287	559	1282	1287	228	563	0	0	449	0	0
Stage 1	818	818	-	460	460	-	-	-	-	-	-	-
Stage 2	245	469	-	822	827	-	-	-	-	-	-	-
Critical Hdwy	7.345	6.545	6.245	7.345	6.545	6.945	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	6.145	5.545	-	6.545	5.545	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.545	5.545	-	6.145	5.545	-	-	-	-	-	-	-
Follow-up Hdwy	3.5285	4.0285	3.3285	3.5285	4.0285	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	188	162	525	131	162	773	1001	-	-	1103	-	-
Stage 1	367	387	-	549	563	-	-	-	-	-	-	-
Stage 2	735	558	-	365	383	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	139	140	520	114	140	766	996	-	-	1098	-	-
Mov Cap-2 Maneuver	139	140	-	114	140	-	-	-	-	-	-	-
Stage 1	361	339	-	541	555	-	-	-	-	-	-	-
Stage 2	614	550	-	314	336	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29	14	0.2	1.7
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	996	-	-	139	293	114	140	766	1098	-	-
HCM Lane V/C Ratio	0.01	-	-	0.117	0.026	0.095	0.039	0.143	0.12	-	-
HCM Control Delay (s)	8.7	-	-	34.3	17.6	39.9	31.8	10.5	8.7	-	-
HCM Lane LOS	A	-	-	D	C	E	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0.3	0.1	0.5	0.4	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	21	8	24	42	14	15	34	318	34	25	403	24
Future Vol, veh/h	21	8	24	42	14	15	34	318	34	25	403	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	8	24	42	14	15	34	321	34	25	407	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	900	902	429	901	897	348	436	0	0	360	0	0
Stage 1	474	474	-	411	411	-	-	-	-	-	-	-
Stage 2	426	428	-	490	486	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	258	276	624	258	278	693	1118	-	-	1193	-	-
Stage 1	569	556	-	616	593	-	-	-	-	-	-	-
Stage 2	604	583	-	558	549	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	259	618	230	261	686	1113	-	-	1187	-	-
Mov Cap-2 Maneuver	230	259	-	230	261	-	-	-	-	-	-	-
Stage 1	549	542	-	594	572	-	-	-	-	-	-	-
Stage 2	556	562	-	515	535	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.1	22.6	0.7	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1113	-	-	329	275	1187	-	-
HCM Lane V/C Ratio	0.031	-	-	0.163	0.261	0.021	-	-
HCM Control Delay (s)	8.3	-	-	18.1	22.6	8.1	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	1	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	0	0	26	60	362	20	45	358	21
Future Vol, veh/h	0	0	31	0	0	26	60	362	20	45	358	21
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	92	96	92	92	92	96	96	92	92	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	32	0	0	28	63	377	22	49	373	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	208	-	-	388	400	0	0	399	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	796	0	0	657	1151	-	-	1152	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	788	-	-	657	1146	-	-	1152	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	10.7	1.1	0.9
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	788	657	1152	-	-
HCM Lane V/C Ratio	0.055	-	-	0.041	0.043	0.042	-	-
HCM Control Delay (s)	8.3	-	-	9.8	10.7	8.3	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	19	1	27	1	1	1	42	379	1	52	332	24
Future Vol, veh/h	19	1	27	1	1	1	42	379	1	52	332	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	20	1	28	1	1	1	44	395	1	54	346	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	962	961	369	975	973	406	376	0	0	401	0	0
Stage 1	472	472	-	489	489	-	-	-	-	-	-	-
Stage 2	490	489	-	486	484	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	234	255	674	230	251	643	1177	-	-	1152	-	-
Stage 1	571	557	-	559	548	-	-	-	-	-	-	-
Stage 2	558	548	-	561	550	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	216	232	668	204	228	637	1171	-	-	1147	-	-
Mov Cap-2 Maneuver	216	232	-	204	228	-	-	-	-	-	-	-
Stage 1	547	528	-	536	524	-	-	-	-	-	-	-
Stage 2	533	524	-	509	521	-	-	-	-	-	-	-

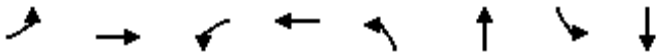
Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	18.2	0.8	1.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1171	-	-	354	276	1147	-	-
HCM Lane V/C Ratio	0.037	-	-	0.138	0.011	0.047	-	-
HCM Control Delay (s)	8.2	-	-	16.8	18.2	8.3	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	195	21	34	260	131	13	167	33	133	171	76
Future Volume (veh/h)	88	195	21	34	260	131	13	167	33	133	171	76
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		0.97	1.00		0.98	1.00		0.97	1.00		0.96
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	95	210	23	37	280	141	14	180	35	143	184	82
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	122	563	62	68	362	182	30	285	55	185	333	149
Arrive On Green	0.07	0.35	0.35	0.04	0.32	0.32	0.02	0.19	0.19	0.11	0.28	0.28
Sat Flow, veh/h	1740	1612	177	1740	1139	573	1740	1480	288	1740	1184	528
Grp Volume(v), veh/h	95	0	233	37	0	421	14	0	215	143	0	266
Grp Sat Flow(s),veh/h/ln	1740	0	1789	1740	0	1712	1740	0	1767	1740	0	1711
Q Serve(g_s), s	3.1	0.0	5.5	1.2	0.0	12.7	0.5	0.0	6.4	4.6	0.0	7.5
Cycle Q Clear(g_c), s	3.1	0.0	5.5	1.2	0.0	12.7	0.5	0.0	6.4	4.6	0.0	7.5
Prop In Lane	1.00		0.10	1.00		0.33	1.00		0.16	1.00		0.31
Lane Grp Cap(c), veh/h	122	0	625	68	0	544	30	0	341	185	0	482
V/C Ratio(X)	0.78	0.00	0.37	0.55	0.00	0.77	0.46	0.00	0.63	0.77	0.00	0.55
Avail Cap(c_a), veh/h	330	0	1181	199	0	1001	183	0	618	465	0	875
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	26.0	0.0	13.9	26.9	0.0	17.6	27.7	0.0	21.1	24.8	0.0	17.4
Incr Delay (d2), s/veh	10.1	0.0	0.4	6.7	0.0	2.4	10.5	0.0	1.9	6.7	0.0	1.0
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	1.8	0.0	2.8	0.7	0.0	6.3	0.3	0.0	3.3	2.5	0.0	3.7
LnGrp Delay(d),s/veh	36.2	0.0	14.2	33.6	0.0	19.9	38.2	0.0	23.0	31.5	0.0	18.4
LnGrp LOS	D		B	C		B	D		C	C		B
Approach Vol, veh/h		328			458			229			409	
Approach Delay, s/veh		20.6			21.0			24.0			22.9	
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	10.1	15.9	6.2	24.8	5.0	20.9	8.0	23.0
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	15.2	19.9	6.5	37.6	6.0	29.1	10.8	33.3
Max Q Clear Time (g_c+I1), s	6.6	8.4	3.2	7.5	2.5	9.5	5.1	14.7
Green Ext Time (p_c), s	0.2	2.0	0.0	3.8	0.0	2.5	0.1	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	22.0
HCM 2010 LOS	C



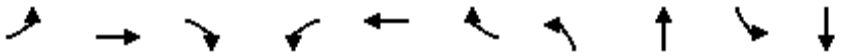
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	95	233	37	421	14	215	143	266
v/c Ratio	0.40	0.33	0.21	0.72	0.08	0.57	0.48	0.43
Control Delay	41.7	19.5	42.6	31.3	41.9	36.6	40.0	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.7	19.5	42.6	31.3	41.9	36.6	40.0	21.2
Queue Length 50th (ft)	43	80	17	172	6	92	65	81
Queue Length 95th (ft)	108	156	54	318	28	191	145	199
Internal Link Dist (ft)		2439		7910		2074		1196
Turn Bay Length (ft)	350		350		200		170	
Base Capacity (vph)	318	1029	191	925	177	605	448	888
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.23	0.19	0.46	0.08	0.36	0.32	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	435	46	320	562	278	21	37	264	152	58	14
Future Volume (veh/h)	6	435	46	320	562	278	21	37	264	152	58	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		0.92	1.00		0.95	1.00		0.95	1.00		0.94
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	6	458	48	337	592	293	22	39	278	160	61	15
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	14	723	296	384	770	620	42	45	318	197	458	113
Arrive On Green	0.01	0.21	0.21	0.22	0.42	0.42	0.02	0.24	0.24	0.11	0.33	0.33
Sat Flow, veh/h	1740	3471	1423	1740	1827	1472	1740	187	1331	1740	1397	343
Grp Volume(v), veh/h	6	458	48	337	592	293	22	0	317	160	0	76
Grp Sat Flow(s),veh/h/ln	1740	1736	1423	1740	1827	1472	1740	0	1517	1740	0	1740
Q Serve(g_s), s	0.3	9.8	2.2	15.2	22.6	11.7	1.0	0.0	16.3	7.3	0.0	2.5
Cycle Q Clear(g_c), s	0.3	9.8	2.2	15.2	22.6	11.7	1.0	0.0	16.3	7.3	0.0	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.88	1.00		0.20
Lane Grp Cap(c), veh/h	14	723	296	384	770	620	42	0	362	197	0	571
V/C Ratio(X)	0.44	0.63	0.16	0.88	0.77	0.47	0.53	0.00	0.87	0.81	0.00	0.13
Avail Cap(c_a), veh/h	126	858	352	599	948	764	126	0	431	300	0	668
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.2	29.4	26.4	30.6	20.1	17.0	39.2	0.0	29.8	35.2	0.0	19.2
Incr Delay (d2), s/veh	21.0	1.1	0.3	9.1	3.1	0.6	9.8	0.0	15.9	9.5	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.8	0.9	8.3	12.0	4.8	0.6	0.0	8.5	4.0	0.0	1.2
LnGrp Delay(d),s/veh	61.2	30.5	26.6	39.7	23.3	17.6	49.0	0.0	45.7	44.8	0.0	19.3
LnGrp LOS	E	C	C	D	C	B	D		D	D		B
Approach Vol, veh/h		512			1222			339			236	
Approach Delay, s/veh		30.5			26.4			45.9			36.6	
Approach LOS		C			C			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	13.2	24.3	21.9	21.8	6.0	31.6	4.6	39.2
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	14.0	23.1	28.0	20.1	5.9	31.2	5.9	42.2
Max Q Clear Time (g_c+I1), s	9.3	18.3	17.2	11.8	3.0	4.5	2.3	24.6
Green Ext Time (p_c), s	0.2	1.1	0.7	4.5	0.0	2.8	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	6	458	48	337	592	293	22	317	160	76
v/c Ratio	0.04	0.64	0.11	0.74	0.64	0.35	0.16	0.73	0.59	0.14
Control Delay	41.7	33.9	0.5	37.9	19.6	4.0	43.0	18.0	43.1	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.7	33.9	0.5	37.9	19.6	4.0	43.0	18.0	43.1	22.0
Queue Length 50th (ft)	3	102	0	141	175	6	10	17	68	20
Queue Length 95th (ft)	17	194	0	288	448	61	39	105	#177	67
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	142	969	529	675	1098	960	142	673	337	761
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.47	0.09	0.50	0.54	0.31	0.15	0.47	0.47	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	2	8	7	7	222	5	579	5	104	362	18
Future Volume (veh/h)	22	2	8	7	7	222	5	579	5	104	362	18
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		0.96	1.00		0.98	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	26	2	9	8	8	258	6	673	6	121	421	21
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	53	67	303	18	402	333	14	1067	461	155	710	584
Arrive On Green	0.03	0.24	0.24	0.01	0.22	0.22	0.01	0.30	0.30	0.09	0.38	0.38
Sat Flow, veh/h	1757	284	1276	1757	1845	1531	1757	3505	1515	1757	1845	1519
Grp Volume(v), veh/h	26	0	11	8	8	258	6	673	6	121	421	21
Grp Sat Flow(s),veh/h/ln	1757	0	1560	1757	1845	1531	1757	1752	1515	1757	1845	1519
Q Serve(g_s), s	0.7	0.0	0.3	0.2	0.2	7.9	0.2	8.2	0.1	3.3	9.0	0.4
Cycle Q Clear(g_c), s	0.7	0.0	0.3	0.2	0.2	7.9	0.2	8.2	0.1	3.3	9.0	0.4
Prop In Lane	1.00		0.82	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	53	0	371	18	402	333	14	1067	461	155	710	584
V/C Ratio(X)	0.49	0.00	0.03	0.43	0.02	0.77	0.43	0.63	0.01	0.78	0.59	0.04
Avail Cap(c_a), veh/h	209	0	566	209	670	556	209	1435	620	283	833	686
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	14.5	24.4	15.2	18.2	24.5	14.8	12.0	22.1	12.2	9.5
Incr Delay (d2), s/veh	6.7	0.0	0.0	15.2	0.0	3.8	19.2	0.6	0.0	8.2	0.8	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	0.4	0.0	0.1	0.2	0.1	3.7	0.2	4.0	0.1	2.0	4.7	0.2
LnGrp Delay(d),s/veh	30.4	0.0	14.5	39.5	15.3	22.1	43.7	15.5	12.1	30.3	13.0	9.5
LnGrp LOS	C		B	D	B	C	D	B	B	C	B	A
Approach Vol, veh/h		37			274			685			563	
Approach Delay, s/veh		25.7			22.4			15.7			16.6	
Approach LOS		C			C			B			B	

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	8.4	20.0	4.5	16.7	4.4	24.0	5.5	15.7
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	8.0	20.3	5.9	18.0	5.9	22.4	5.9	18.0
Max Q Clear Time (g_c+I1), s	5.3	10.2	2.2	2.3	2.2	11.0	2.7	9.9
Green Ext Time (p_c), s	0.1	4.7	0.0	0.9	0.0	5.0	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	26	11	8	8	258	6	673	6	121	421	21
v/c Ratio	0.11	0.04	0.03	0.03	0.56	0.03	0.51	0.01	0.40	0.41	0.02
Control Delay	23.9	13.4	23.4	19.4	8.8	23.4	14.5	0.0	25.5	10.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	13.4	23.4	19.4	8.8	23.4	14.5	0.0	25.5	10.3	0.1
Queue Length 50th (ft)	5	0	2	2	0	1	65	0	24	36	0
Queue Length 95th (ft)	29	12	14	12	47	12	157	0	#90	212	0
Internal Link Dist (ft)		904		874			1832			2179	
Turn Bay Length (ft)	250		1			270		200	250		
Base Capacity (vph)	240	661	240	771	790	240	1652	794	325	1069	941
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.02	0.03	0.01	0.33	0.03	0.41	0.01	0.37	0.39	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	24	15	45	64	21	28	17	400	51	39	315	9
Future Vol, veh/h	24	15	45	64	21	28	17	400	51	39	315	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	27	17	51	72	24	31	19	449	57	44	354	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1000	1001	369	1007	978	488	369	0	0	511	0	0
Stage 1	452	452	-	521	521	-	-	-	-	-	-	-
Stage 2	548	549	-	486	457	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	221	242	674	219	249	578	1184	-	-	1049	-	-
Stage 1	585	569	-	537	530	-	-	-	-	-	-	-
Stage 2	519	515	-	561	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	183	226	668	181	232	573	1178	-	-	1044	-	-
Mov Cap-2 Maneuver	183	226	-	181	232	-	-	-	-	-	-	-
Stage 1	573	542	-	526	519	-	-	-	-	-	-	-
Stage 2	458	504	-	479	539	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	38.7	0.3	0.9
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	317	229	1044	-	-
HCM Lane V/C Ratio	0.016	-	-	0.298	0.554	0.042	-	-
HCM Control Delay (s)	8.1	-	-	21.1	38.7	8.6	-	-
HCM Lane LOS	A	-	-	C	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	3	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	39	0	0	53	56	405	6	13	434	6
Future Vol, veh/h	0	0	39	0	0	53	56	405	6	13	434	6
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	92	83	92	92	92	83	83	92	92	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	47	0	0	58	67	488	7	14	523	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	275	-	-	492	535	0	0	495	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	721	0	0	573	1025	-	-	1061	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	714	-	-	573	1020	-	-	1061	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	12	1.1	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1020	-	-	714	573	1061	-	-
HCM Lane V/C Ratio	0.066	-	-	0.066	0.101	0.013	-	-
HCM Control Delay (s)	8.8	-	-	10.4	12	8.4	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Traffic Vol, veh/h	25	1	36	1	1	1	13	341	3	34	498	5
Future Vol, veh/h	25	1	36	1	1	1	13	341	3	34	498	5
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	29	1	42	1	1	1	15	401	4	40	586	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1113	1114	599	1134	1115	413	597	0	0	410	0	0
Stage 1	674	674	-	438	438	-	-	-	-	-	-	-
Stage 2	439	440	-	696	677	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	185	207	500	179	207	637	975	-	-	1143	-	-
Stage 1	443	452	-	595	577	-	-	-	-	-	-	-
Stage 2	595	576	-	430	451	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	175	195	495	155	195	631	970	-	-	1138	-	-
Mov Cap-2 Maneuver	175	195	-	155	195	-	-	-	-	-	-	-
Stage 1	434	434	-	583	565	-	-	-	-	-	-	-
Stage 2	581	564	-	377	433	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.2	21	0.3	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	970	-	-	281	228	1138	-	-
HCM Lane V/C Ratio	0.016	-	-	0.26	0.015	0.035	-	-
HCM Control Delay (s)	8.8	-	-	22.2	21	8.3	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	246	15	24	193	124	22	176	45	241	242	100
Future Volume (veh/h)	72	246	15	24	193	124	22	176	45	241	242	100
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		0.97	1.00		0.96	1.00		0.98	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	79	270	16	26	212	136	24	193	49	265	266	110
Adj No. of Lanes	1	1	0	1	1	0	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	103	508	30	50	274	176	47	289	73	322	666	548
Arrive On Green	0.06	0.30	0.30	0.03	0.27	0.27	0.03	0.21	0.21	0.18	0.36	0.36
Sat Flow, veh/h	1740	1704	101	1740	1025	657	1740	1399	355	1740	1827	1504
Grp Volume(v), veh/h	79	0	286	26	0	348	24	0	242	265	266	110
Grp Sat Flow(s),veh/h/ln	1740	0	1805	1740	0	1682	1740	0	1754	1740	1827	1504
Q Serve(g_s), s	2.8	0.0	8.4	0.9	0.0	12.1	0.9	0.0	8.0	9.3	6.9	3.2
Cycle Q Clear(g_c), s	2.8	0.0	8.4	0.9	0.0	12.1	0.9	0.0	8.0	9.3	6.9	3.2
Prop In Lane	1.00		0.06	1.00		0.39	1.00		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	103	0	538	50	0	450	47	0	362	322	666	548
V/C Ratio(X)	0.77	0.00	0.53	0.52	0.00	0.77	0.51	0.00	0.67	0.82	0.40	0.20
Avail Cap(c_a), veh/h	220	0	802	165	0	694	165	0	641	605	1129	930
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	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	18.5	30.3	0.0	21.4	30.3	0.0	23.1	24.8	15.0	13.8
Incr Delay (d2), s/veh	11.1	0.0	0.8	7.9	0.0	2.9	8.2	0.0	2.1	5.3	0.4	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	1.7	0.0	4.3	0.6	0.0	6.0	0.5	0.0	4.1	4.9	3.5	1.3
LnGrp Delay(d),s/veh	40.4	0.0	19.3	38.2	0.0	24.3	38.5	0.0	25.2	30.1	15.3	14.0
LnGrp LOS	D		B	D		C	D		C	C	B	B
Approach Vol, veh/h		365			374			266			641	
Approach Delay, s/veh		23.9			25.2			26.4			21.2	
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	15.7	18.0	5.8	23.7	5.7	27.9	7.8	21.8
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	22.0	23.1	6.0	28.1	6.0	39.1	8.0	26.1
Max Q Clear Time (g_c+I1), s	11.3	10.0	2.9	10.4	2.9	8.9	4.8	14.1
Green Ext Time (p_c), s	0.5	2.6	0.0	3.2	0.0	3.3	0.0	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	79	286	26	348	24	242	265	266	110
v/c Ratio	0.44	0.48	0.18	0.75	0.17	0.65	0.69	0.33	0.15
Control Delay	47.5	26.0	43.9	37.6	43.7	38.0	41.0	18.5	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	26.0	43.9	37.6	43.7	38.0	41.0	18.5	4.5
Queue Length 50th (ft)	38	97	13	146	12	108	123	79	0
Queue Length 95th (ft)	#103	230	42	#284	41	204	237	177	32
Internal Link Dist (ft)		2439		7910		2074		1196	
Turn Bay Length (ft)	350		350		200		170		150
Base Capacity (vph)	200	757	150	658	150	596	551	1031	892
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.38	0.17	0.53	0.16	0.41	0.48	0.26	0.12

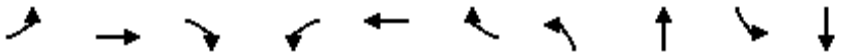
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	896	44	258	606	120	47	58	531	283	39	31
Future Volume (veh/h)	37	896	44	258	606	120	47	58	531	283	39	31
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		0.92	1.00		0.94	1.00		0.96	1.00		0.95
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	39	953	47	274	645	128	50	62	565	301	41	33
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	57	719	295	304	638	511	65	40	363	308	371	298
Arrive On Green	0.03	0.21	0.21	0.17	0.35	0.35	0.04	0.27	0.27	0.18	0.41	0.41
Sat Flow, veh/h	1740	3471	1422	1740	1827	1462	1740	150	1365	1740	913	735
Grp Volume(v), veh/h	39	953	47	274	645	128	50	0	627	301	0	74
Grp Sat Flow(s),veh/h/ln	1740	1736	1422	1740	1827	1462	1740	0	1515	1740	0	1649
Q Serve(g_s), s	2.3	21.1	2.8	15.7	35.6	6.4	2.9	0.0	27.1	17.5	0.0	2.8
Cycle Q Clear(g_c), s	2.3	21.1	2.8	15.7	35.6	6.4	2.9	0.0	27.1	17.5	0.0	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		0.45
Lane Grp Cap(c), veh/h	57	719	295	304	638	511	65	0	403	308	0	669
V/C Ratio(X)	0.68	1.32	0.16	0.90	1.01	0.25	0.77	0.00	1.55	0.98	0.00	0.11
Avail Cap(c_a), veh/h	103	719	295	325	638	511	106	0	403	308	0	669
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.7	40.4	33.1	41.1	33.1	23.6	48.6	0.0	37.4	41.7	0.0	18.8
Incr Delay (d2), s/veh	13.4	155.7	0.3	25.7	38.3	0.3	17.5	0.0	261.4	45.3	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	1.3	25.5	1.1	9.7	24.5	2.6	1.7	0.0	40.5	12.2	0.0	1.3
LnGrp Delay(d),s/veh	62.1	196.0	33.3	66.8	71.4	23.9	66.1	0.0	298.8	87.0	0.0	18.9
LnGrp LOS	E	F	C	E	F	C	E		F	F		B
Approach Vol, veh/h		1039			1047			677			375	
Approach Delay, s/veh		183.6			64.4			281.6			73.5	
Approach LOS		F			E			F			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	22.0	32.0	21.8	26.0	7.8	46.2	7.3	40.5
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	18.0	27.1	19.0	21.1	6.2	38.9	6.0	34.1
Max Q Clear Time (g_c+I1), s	19.5	29.1	17.7	23.1	4.9	4.8	4.3	37.6
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	6.3	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	151.8
HCM 2010 LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	953	47	274	645	128	50	627	301	74
v/c Ratio	0.38	1.31	0.11	0.88	0.95	0.21	0.48	0.97	0.97	0.11
Control Delay	58.0	182.0	0.5	69.4	58.1	3.9	62.6	45.8	86.9	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	182.0	0.5	69.4	58.1	3.9	62.6	45.8	86.9	13.4
Queue Length 50th (ft)	25	~432	0	176	~471	0	32	201	200	17
Queue Length 95th (ft)	60	#559	0	#319	#689	31	#74	#442	#373	47
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	104	729	445	328	678	619	107	666	311	664
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.31	0.11	0.84	0.95	0.21	0.47	0.94	0.97	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	2	5	11	5	101	9	452	9	121	569	17
Future Volume (veh/h)	15	2	5	11	5	101	9	452	9	121	569	17
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		0.94	1.00		0.97	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	16	2	5	12	5	110	10	491	10	132	618	18
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	35	54	136	27	215	176	23	1277	553	172	829	684
Arrive On Green	0.02	0.12	0.12	0.02	0.12	0.12	0.01	0.36	0.36	0.10	0.45	0.45
Sat Flow, veh/h	1757	448	1121	1757	1845	1515	1757	3505	1518	1757	1845	1522
Grp Volume(v), veh/h	16	0	7	12	5	110	10	491	10	132	618	18
Grp Sat Flow(s),veh/h/ln	1757	0	1570	1757	1845	1515	1757	1752	1518	1757	1845	1522
Q Serve(g_s), s	0.4	0.0	0.2	0.3	0.1	3.1	0.3	4.6	0.2	3.3	12.3	0.3
Cycle Q Clear(g_c), s	0.4	0.0	0.2	0.3	0.1	3.1	0.3	4.6	0.2	3.3	12.3	0.3
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	35	0	190	27	215	176	23	1277	553	172	829	684
V/C Ratio(X)	0.45	0.00	0.04	0.44	0.02	0.62	0.44	0.38	0.02	0.77	0.75	0.03
Avail Cap(c_a), veh/h	234	0	637	234	749	615	234	1659	719	487	1139	940
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	0.0	17.2	21.6	17.4	18.7	21.7	10.4	9.0	19.5	10.1	6.8
Incr Delay (d2), s/veh	8.7	0.0	0.1	10.8	0.0	3.6	12.5	0.2	0.0	7.0	1.8	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	0.1	0.2	0.1	1.4	0.2	2.2	0.1	1.9	6.6	0.1
LnGrp Delay(d),s/veh	30.2	0.0	17.3	32.4	17.4	22.3	34.2	10.6	9.0	26.5	11.9	6.8
LnGrp LOS	C		B	C	B	C	C	B	A	C	B	A
Approach Vol, veh/h		23			127			511			768	
Approach Delay, s/veh		26.3			23.0			11.0			14.3	
Approach LOS		C			C			B			B	

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	8.3	21.1	4.7	10.3	4.6	24.8	4.9	10.1
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	12.3	21.0	5.9	18.0	5.9	27.4	5.9	18.0
Max Q Clear Time (g_c+I1), s	5.3	6.6	2.3	2.2	2.3	14.3	2.4	5.1
Green Ext Time (p_c), s	0.2	5.9	0.0	0.3	0.0	5.6	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	7	12	5	110	10	491	10	132	618	18
v/c Ratio	0.06	0.03	0.05	0.02	0.28	0.04	0.32	0.01	0.36	0.52	0.02
Control Delay	21.9	16.8	21.7	21.6	2.2	21.8	12.9	0.0	20.1	10.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	16.8	21.7	21.6	2.2	21.8	12.9	0.0	20.1	10.4	0.1
Queue Length 50th (ft)	3	0	2	1	0	2	45	0	24	61	0
Queue Length 95th (ft)	22	11	18	11	5	16	114	0	90	#359	0
Internal Link Dist (ft)		904		874			1832			2179	
Turn Bay Length (ft)	250		1			270		200	250		
Base Capacity (vph)	257	720	257	826	797	257	2063	972	536	1257	1077
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.05	0.01	0.14	0.04	0.24	0.01	0.25	0.49	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	23	16	28	78	17	23	35	361	84	58	442	24
Future Vol, veh/h	23	16	28	78	17	23	35	361	84	58	442	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	23	16	28	79	17	23	35	365	85	59	446	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1084	1106	468	1086	1076	418	475	0	0	455	0	0
Stage 1	581	581	-	483	483	-	-	-	-	-	-	-
Stage 2	503	525	-	603	593	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	194	210	593	193	218	633	1082	-	-	1100	-	-
Stage 1	498	498	-	563	551	-	-	-	-	-	-	-
Stage 2	549	528	-	484	492	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	162	190	587	159	198	627	1077	-	-	1095	-	-
Mov Cap-2 Maneuver	162	190	-	159	198	-	-	-	-	-	-	-
Stage 1	480	469	-	542	531	-	-	-	-	-	-	-
Stage 2	493	508	-	419	463	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.2	50.3	0.6	0.9
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1077	-	-	245	192	1095	-	-
HCM Lane V/C Ratio	0.033	-	-	0.276	0.621	0.054	-	-
HCM Control Delay (s)	8.5	-	-	25.2	50.3	8.5	-	-
HCM Lane LOS	A	-	-	D	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	3.5	0.2	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	0	0	26	60	456	20	45	437	21
Future Vol, veh/h	0	0	31	0	0	26	60	456	20	45	437	21
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	92	96	92	92	92	96	96	92	92	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	32	0	0	28	63	475	22	49	455	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	249	-	-	486	482	0	0	497	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	749	0	0	578	1073	-	-	1059	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	742	-	-	578	1068	-	-	1059	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	11.5	1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1068	-	-	742	578	1059	-	-
HCM Lane V/C Ratio	0.059	-	-	0.044	0.049	0.046	-	-
HCM Control Delay (s)	8.6	-	-	10.1	11.5	8.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	19	1	27	1	1	1	42	473	1	52	411	24
Future Vol, veh/h	19	1	27	1	1	1	42	473	1	52	411	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	20	1	28	1	1	1	44	493	1	54	428	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1142	1141	451	1155	1153	504	458	0	0	499	0	0
Stage 1	554	554	-	587	587	-	-	-	-	-	-	-
Stage 2	588	587	-	568	566	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	177	200	606	173	197	566	1098	-	-	1060	-	-
Stage 1	515	512	-	494	495	-	-	-	-	-	-	-
Stage 2	493	495	-	506	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	162	180	600	152	178	561	1093	-	-	1055	-	-
Mov Cap-2 Maneuver	162	180	-	152	178	-	-	-	-	-	-	-
Stage 1	492	483	-	472	473	-	-	-	-	-	-	-
Stage 2	469	473	-	454	478	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.6	22	0.7	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1093	-	-	280	215	1055	-	-
HCM Lane V/C Ratio	0.04	-	-	0.175	0.015	0.051	-	-
HCM Control Delay (s)	8.4	-	-	20.6	22	8.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	199	21	39	263	224	13	224	37	181	197	79
Future Volume (veh/h)	94	199	21	39	263	224	13	224	37	181	197	79
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		0.97	1.00		0.98	1.00		0.98	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	101	214	23	42	283	241	14	241	40	195	212	85
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	129	636	68	67	324	276	29	308	51	236	587	482
Arrive On Green	0.07	0.39	0.39	0.04	0.36	0.36	0.02	0.20	0.20	0.14	0.32	0.32
Sat Flow, veh/h	1740	1616	174	1740	904	770	1740	1522	253	1740	1827	1501
Grp Volume(v), veh/h	101	0	237	42	0	524	14	0	281	195	212	85
Grp Sat Flow(s),veh/h/ln	1740	0	1790	1740	0	1673	1740	0	1775	1740	1827	1501
Q Serve(g_s), s	4.4	0.0	7.2	1.8	0.0	22.6	0.6	0.0	11.6	8.4	6.9	3.2
Cycle Q Clear(g_c), s	4.4	0.0	7.2	1.8	0.0	22.6	0.6	0.0	11.6	8.4	6.9	3.2
Prop In Lane	1.00		0.10	1.00		0.46	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	129	0	704	67	0	599	29	0	359	236	587	482
V/C Ratio(X)	0.78	0.00	0.34	0.63	0.00	0.87	0.48	0.00	0.78	0.83	0.36	0.18
Avail Cap(c_a), veh/h	205	0	847	149	0	738	135	0	482	338	709	582
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	1.00	1.00
Uniform Delay (d), s/veh	35.2	0.0	16.4	36.6	0.0	23.2	37.7	0.0	29.2	32.5	20.2	18.9
Incr Delay (d2), s/veh	10.0	0.0	0.3	9.3	0.0	9.8	11.7	0.0	5.9	10.8	0.4	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	2.5	0.0	3.5	1.1	0.0	12.0	0.4	0.0	6.3	4.8	3.5	1.3
LnGrp Delay(d),s/veh	45.2	0.0	16.7	45.9	0.0	33.0	49.3	0.0	35.1	43.4	20.5	19.1
LnGrp LOS	D		B	D		C	D		D	D	C	B
Approach Vol, veh/h		338			566			295			492	
Approach Delay, s/veh		25.2			33.9			35.8			29.3	
Approach LOS		C			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	14.5	20.5	7.0	35.3	5.3	29.7	9.7	32.6
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	15.0	21.0	6.6	36.6	6.0	30.0	9.1	34.1
Max Q Clear Time (g_c+I1), s	10.4	13.6	3.8	9.2	2.6	8.9	6.4	24.6
Green Ext Time (p_c), s	0.2	1.8	0.0	4.7	0.0	2.9	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	101	237	42	524	14	281	195	212	85
v/c Ratio	0.55	0.34	0.30	0.87	0.11	0.75	0.70	0.29	0.13
Control Delay	54.1	21.0	48.6	41.2	45.0	46.2	52.1	22.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	21.0	48.6	41.2	45.0	46.2	52.1	22.0	3.2
Queue Length 50th (ft)	60	99	25	265	8	156	114	84	0
Queue Length 95th (ft)	#130	163	60	#454	28	#265	#217	166	21
Internal Link Dist (ft)		2439		7910		2074		1196	
Turn Bay Length (ft)	350		350		200		170		150
Base Capacity (vph)	202	857	146	763	133	485	333	788	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.28	0.29	0.69	0.11	0.58	0.59	0.27	0.12

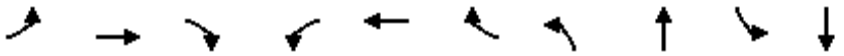
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	750	77	509	930	351	34	56	382	231	76	45
Future Volume (veh/h)	34	750	77	509	930	351	34	56	382	231	76	45
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		0.91	1.00		0.95	1.00		0.95	1.00		0.94
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	36	789	81	536	979	369	36	59	402	243	80	47
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	54	677	276	473	796	642	54	44	296	236	346	203
Arrive On Green	0.03	0.20	0.20	0.27	0.44	0.44	0.03	0.22	0.22	0.14	0.33	0.33
Sat Flow, veh/h	1740	3471	1416	1740	1827	1474	1740	194	1322	1740	1052	618
Grp Volume(v), veh/h	36	789	81	536	979	369	36	0	461	243	0	127
Grp Sat Flow(s),veh/h/ln	1740	1736	1416	1740	1827	1474	1740	0	1516	1740	0	1671
Q Serve(g_s), s	2.1	20.1	5.0	28.0	44.9	19.4	2.1	0.0	23.1	14.0	0.0	5.7
Cycle Q Clear(g_c), s	2.1	20.1	5.0	28.0	44.9	19.4	2.1	0.0	23.1	14.0	0.0	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.87	1.00		0.37
Lane Grp Cap(c), veh/h	54	677	276	473	796	642	54	0	340	236	0	550
V/C Ratio(X)	0.66	1.16	0.29	1.13	1.23	0.57	0.66	0.00	1.36	1.03	0.00	0.23
Avail Cap(c_a), veh/h	100	677	276	473	796	642	100	0	340	236	0	550
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.4	41.5	35.4	37.5	29.1	21.9	49.4	0.0	40.0	44.5	0.0	25.1
Incr Delay (d2), s/veh	13.0	89.7	0.6	83.3	114.3	1.3	13.0	0.0	178.4	65.8	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	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	18.0	2.0	24.3	47.8	8.1	1.2	0.0	26.5	11.0	0.0	2.6
LnGrp Delay(d),s/veh	62.3	131.1	36.0	120.8	143.4	23.1	62.3	0.0	218.3	110.4	0.0	25.3
LnGrp LOS	E	F	D	F	F	C	E		F	F		C
Approach Vol, veh/h		906			1884			497			370	
Approach Delay, s/veh		119.9			113.4			207.0			81.2	
Approach LOS		F			F			F			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	18.0	28.0	32.0	25.0	7.2	38.8	7.2	49.8
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	14.0	23.1	28.0	20.1	5.9	31.2	5.9	42.2
Max Q Clear Time (g_c+I1), s	16.0	25.1	30.0	22.1	4.1	7.7	4.1	46.9
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	124.5
HCM 2010 LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	36	789	81	536	979	369	36	461	243	127
v/c Ratio	0.35	1.09	0.18	1.06	1.11	0.47	0.35	0.90	0.96	0.25
Control Delay	55.4	98.5	0.9	93.6	93.6	11.2	55.4	34.9	92.7	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	98.5	0.9	93.6	93.6	11.2	55.4	34.9	92.7	21.8
Queue Length 50th (ft)	22	~301	0	~381	~773	68	22	96	154	48
Queue Length 95th (ft)	57	#446	0	#618	#1074	163	57	#263	#327	95
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	106	724	444	504	881	790	106	596	252	559
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.09	0.18	1.06	1.11	0.47	0.34	0.77	0.96	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	4	14	11	15	148	6	521	5	69	327	22
Future Volume (veh/h)	27	4	14	11	15	148	6	521	5	69	327	22
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		0.96	1.00		0.97	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	29	4	15	12	16	161	7	566	5	75	355	24
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	60	59	223	27	299	247	16	1062	459	123	671	552
Arrive On Green	0.03	0.18	0.18	0.02	0.16	0.16	0.01	0.30	0.30	0.07	0.36	0.36
Sat Flow, veh/h	1757	329	1232	1757	1845	1524	1757	3505	1514	1757	1845	1518
Grp Volume(v), veh/h	29	0	19	12	16	161	7	566	5	75	355	24
Grp Sat Flow(s),veh/h/ln	1757	0	1561	1757	1845	1524	1757	1752	1514	1757	1845	1518
Q Serve(g_s), s	0.7	0.0	0.4	0.3	0.3	4.1	0.2	5.5	0.1	1.7	6.3	0.4
Cycle Q Clear(g_c), s	0.7	0.0	0.4	0.3	0.3	4.1	0.2	5.5	0.1	1.7	6.3	0.4
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	0	282	27	299	247	16	1062	459	123	671	552
V/C Ratio(X)	0.48	0.00	0.07	0.44	0.05	0.65	0.43	0.53	0.01	0.61	0.53	0.04
Avail Cap(c_a), veh/h	251	0	680	251	804	664	251	1782	770	310	1000	823
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	0.0	14.0	20.2	14.6	16.2	20.3	12.0	10.1	18.7	10.4	8.5
Incr Delay (d2), s/veh	5.9	0.0	0.1	10.7	0.1	2.9	16.6	0.4	0.0	4.8	0.7	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	0.4	0.0	0.2	0.2	0.2	1.9	0.2	2.7	0.0	1.0	3.3	0.2
LnGrp Delay(d),s/veh	25.4	0.0	14.1	30.8	14.7	19.1	36.9	12.4	10.1	23.5	11.0	8.5
LnGrp LOS	C		B	C	B	B	D	B	B	C	B	A
Approach Vol, veh/h		48			189			578			454	
Approach Delay, s/veh		21.0			19.5			12.7			12.9	
Approach LOS		C			B			B			B	

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	6.9	17.4	4.6	12.4	4.4	19.9	5.4	11.6
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	7.3	21.0	5.9	18.0	5.9	22.4	5.9	18.0
Max Q Clear Time (g_c+I1), s	3.7	7.5	2.3	2.4	2.2	8.3	2.7	6.1
Green Ext Time (p_c), s	0.0	4.6	0.0	0.6	0.0	4.8	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	29	19	12	16	161	7	566	5	75	355	24
v/c Ratio	0.11	0.06	0.05	0.05	0.41	0.03	0.33	0.01	0.25	0.33	0.03
Control Delay	23.8	11.9	23.5	20.8	8.5	23.5	12.7	0.0	23.2	10.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	11.9	23.5	20.8	8.5	23.5	12.7	0.0	23.2	10.2	0.0
Queue Length 50th (ft)	6	1	2	3	0	1	51	0	14	30	0
Queue Length 95th (ft)	32	17	18	20	44	13	129	0	62	177	0
Internal Link Dist (ft)		904		874			1832			2179	
Turn Bay Length (ft)	250		1			270		200	250		
Base Capacity (vph)	270	752	270	869	807	270	2067	955	334	1122	981
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.03	0.04	0.02	0.20	0.03	0.27	0.01	0.22	0.32	0.02

Intersection Summary

Intersection	
Int Delay, s/veh	19.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	21	65	44	88	25	28	18	459	156	38	297	9
Future Vol, veh/h	21	65	44	88	25	28	18	459	156	38	297	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	23	71	48	96	27	30	20	499	170	41	323	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1073	1129	338	1104	1049	594	338	0	0	674	0	0
Stage 1	415	415	-	629	629	-	-	-	-	-	-	-
Stage 2	658	714	-	475	420	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	197	203	702	188	227	503	1216	-	-	912	-	-
Stage 1	613	591	-	469	474	-	-	-	-	-	-	-
Stage 2	452	433	-	569	588	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	158	189	695	118	211	498	1210	-	-	908	-	-
Mov Cap-2 Maneuver	158	189	-	118	211	-	-	-	-	-	-	-
Stage 1	600	561	-	459	464	-	-	-	-	-	-	-
Stage 2	391	423	-	440	559	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.1	131.9	0.2	1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1210	-	-	241	153	908	-	-
HCM Lane V/C Ratio	0.016	-	-	0.586	1.002	0.045	-	-
HCM Control Delay (s)	8	-	-	39.1	131.9	9.2	-	-
HCM Lane LOS	A	-	-	E	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	3.4	7.6	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	39	0	0	127	122	482	14	31	383	6
Future Vol, veh/h	0	0	39	0	0	127	122	482	14	31	383	6
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	42	0	0	138	133	524	15	34	416	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	222	-	-	532	428	0	0	539	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	780	0	0	544	1123	-	-	1021	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	773	-	-	544	1118	-	-	1021	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	13.9	1.7	0.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1118	-	-	773	544	1021	-	-
HCM Lane V/C Ratio	0.119	-	-	0.055	0.254	0.033	-	-
HCM Control Delay (s)	8.7	-	-	9.9	13.9	8.6	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.2	1	0.1	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	25	1	36	1	1	1	13	396	3	45	502	5
Future Vol, veh/h	25	1	36	1	1	1	13	396	3	45	502	5
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	27	1	39	1	1	1	14	430	3	49	546	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1118	1118	559	1137	1119	442	556	0	0	438	0	0
Stage 1	652	652	-	465	465	-	-	-	-	-	-	-
Stage 2	466	466	-	672	654	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	183	206	527	178	206	613	1010	-	-	1117	-	-
Stage 1	455	463	-	576	561	-	-	-	-	-	-	-
Stage 2	575	561	-	444	462	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	172	192	522	155	192	607	1005	-	-	1112	-	-
Mov Cap-2 Maneuver	172	192	-	155	192	-	-	-	-	-	-	-
Stage 1	446	440	-	565	550	-	-	-	-	-	-	-
Stage 2	562	550	-	390	439	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.7	21.2	0.3	0.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1005	-	-	282	225	1112	-	-
HCM Lane V/C Ratio	0.014	-	-	0.239	0.014	0.044	-	-
HCM Control Delay (s)	8.6	-	-	21.7	21.2	8.4	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	441	18	48	334	108	27	153	79	277	237	121
Future Volume (veh/h)	89	441	18	48	334	108	27	153	79	277	237	121
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		0.97	1.00		0.97	1.00		0.97	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	97	479	20	52	363	117	29	166	86	301	258	132
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	123	610	25	74	423	136	51	215	111	343	655	539
Arrive On Green	0.07	0.35	0.35	0.04	0.32	0.32	0.03	0.19	0.19	0.20	0.36	0.36
Sat Flow, veh/h	1740	1739	73	1740	1312	423	1740	1124	582	1740	1827	1503
Grp Volume(v), veh/h	97	0	499	52	0	480	29	0	252	301	258	132
Grp Sat Flow(s),veh/h/ln	1740	0	1811	1740	0	1735	1740	0	1706	1740	1827	1503
Q Serve(g_s), s	4.5	0.0	20.1	2.4	0.0	21.1	1.3	0.0	11.4	13.7	8.6	5.0
Cycle Q Clear(g_c), s	4.5	0.0	20.1	2.4	0.0	21.1	1.3	0.0	11.4	13.7	8.6	5.0
Prop In Lane	1.00		0.04	1.00		0.24	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	123	0	635	74	0	559	51	0	326	343	655	539
V/C Ratio(X)	0.79	0.00	0.79	0.70	0.00	0.86	0.56	0.00	0.77	0.88	0.39	0.24
Avail Cap(c_a), veh/h	171	0	714	128	0	641	126	0	421	449	790	650
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	1.00	1.00
Uniform Delay (d), s/veh	37.2	0.0	23.7	38.5	0.0	25.9	39.0	0.0	31.3	31.7	19.5	18.4
Incr Delay (d2), s/veh	15.0	0.0	5.2	11.5	0.0	10.2	9.4	0.0	6.6	14.3	0.4	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	2.7	0.0	10.9	1.4	0.0	11.6	0.8	0.0	6.0	7.9	4.4	2.1
LnGrp Delay(d),s/veh	52.2	0.0	28.9	50.0	0.0	36.0	48.4	0.0	37.8	46.0	19.9	18.6
LnGrp LOS	D		C	D		D	D		D	D	B	B
Approach Vol, veh/h		596			532			281			691	
Approach Delay, s/veh		32.7			37.4			38.9			31.0	
Approach LOS		C			D			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	20.1	20.5	7.5	33.5	6.4	34.1	9.8	31.1
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	21.0	20.1	6.0	32.1	5.9	35.2	8.0	30.1
Max Q Clear Time (g_c+I1), s	15.7	13.4	4.4	22.1	3.3	10.6	6.5	23.1
Green Ext Time (p_c), s	0.4	1.8	0.0	4.0	0.0	3.3	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	97	499	52	480	29	252	301	258	132
v/c Ratio	0.60	0.77	0.42	0.85	0.24	0.73	0.79	0.36	0.20
Control Delay	59.0	35.8	53.9	44.4	47.9	44.7	50.2	22.8	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	35.8	53.9	44.4	47.9	44.7	50.2	22.8	4.9
Queue Length 50th (ft)	58	269	31	259	17	130	171	116	0
Queue Length 95th (ft)	#135	#453	#75	#451	46	216	#310	184	37
Internal Link Dist (ft)		2439		7910		2074		1196	
Turn Bay Length (ft)	350		350		200		170		150
Base Capacity (vph)	170	741	127	654	125	442	447	794	724
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.67	0.41	0.73	0.23	0.57	0.67	0.32	0.18

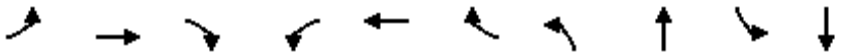
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	913	72	290	642	102	52	52	536	259	43	11
Future Volume (veh/h)	35	913	72	290	642	102	52	52	536	259	43	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		0.93	1.00		0.95	1.00		0.96	1.00		0.94
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	38	992	78	315	698	111	57	57	583	282	47	12
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	56	947	394	287	741	597	73	33	335	253	481	123
Arrive On Green	0.03	0.27	0.27	0.17	0.41	0.41	0.04	0.24	0.24	0.15	0.35	0.35
Sat Flow, veh/h	1740	3471	1446	1740	1827	1470	1740	134	1374	1740	1385	354
Grp Volume(v), veh/h	38	992	78	315	698	111	57	0	640	282	0	59
Grp Sat Flow(s),veh/h/ln	1740	1736	1446	1740	1827	1470	1740	0	1508	1740	0	1739
Q Serve(g_s), s	2.2	28.1	4.3	17.0	37.8	5.0	3.3	0.0	25.1	15.0	0.0	2.4
Cycle Q Clear(g_c), s	2.2	28.1	4.3	17.0	37.8	5.0	3.3	0.0	25.1	15.0	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.91	1.00		0.20
Lane Grp Cap(c), veh/h	56	947	394	287	741	597	73	0	368	253	0	604
V/C Ratio(X)	0.68	1.05	0.20	1.10	0.94	0.19	0.78	0.00	1.74	1.11	0.00	0.10
Avail Cap(c_a), veh/h	100	947	394	287	741	597	152	0	368	253	0	604
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	37.5	28.8	43.0	29.4	19.7	48.9	0.0	39.0	44.0	0.0	22.7
Incr Delay (d2), s/veh	13.4	42.5	0.2	81.5	20.2	0.1	16.4	0.0	344.6	90.2	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	1.3	19.0	1.7	14.6	23.2	2.1	1.9	0.0	45.6	13.5	0.0	1.1
LnGrp Delay(d),s/veh	62.7	79.9	29.0	124.5	49.6	19.8	65.2	0.0	383.5	134.2	0.0	22.8
LnGrp LOS	E	F	C	F	D	B	E		F	F		C
Approach Vol, veh/h		1108			1124			697			341	
Approach Delay, s/veh		75.8			67.7			357.5			115.0	
Approach LOS		E			E			F			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	19.0	30.0	21.0	33.0	8.3	40.7	7.3	46.7
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	15.0	25.1	17.0	28.1	9.0	31.1	5.9	39.2
Max Q Clear Time (g_c+I1), s	17.0	27.1	19.0	30.1	5.3	4.4	4.2	39.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	137.1
HCM 2010 LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	992	78	315	698	111	57	640	282	59
v/c Ratio	0.39	1.05	0.15	1.10	0.91	0.16	0.43	1.09	1.12	0.10
Control Delay	58.7	80.1	0.6	124.5	47.7	2.1	55.1	87.2	134.1	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	80.1	0.6	124.5	47.7	2.1	55.1	87.2	134.1	22.1
Queue Length 50th (ft)	25	~375	0	~236	~457	0	36	~322	~214	22
Queue Length 95th (ft)	59	#503	0	#407	#705	19	77	#542	#378	53
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	99	946	524	286	765	680	151	585	252	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.05	0.15	1.10	0.91	0.16	0.38	1.09	1.12	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	4	9	18	11	67	11	408	9	81	513	21
Future Volume (veh/h)	18	4	9	18	11	67	11	408	9	81	513	21
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		0.94	1.00		0.97	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	20	4	10	20	12	73	12	443	10	88	558	23
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	44	49	122	44	201	165	27	1204	521	134	786	648
Arrive On Green	0.02	0.11	0.11	0.02	0.11	0.11	0.02	0.34	0.34	0.08	0.43	0.43
Sat Flow, veh/h	1757	448	1121	1757	1845	1516	1757	3505	1517	1757	1845	1521
Grp Volume(v), veh/h	20	0	14	20	12	73	12	443	10	88	558	23
Grp Sat Flow(s),veh/h/ln	1757	0	1569	1757	1845	1516	1757	1752	1517	1757	1845	1521
Q Serve(g_s), s	0.5	0.0	0.3	0.5	0.2	1.9	0.3	4.0	0.2	2.0	10.4	0.4
Cycle Q Clear(g_c), s	0.5	0.0	0.3	0.5	0.2	1.9	0.3	4.0	0.2	2.0	10.4	0.4
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	0	171	44	201	165	27	1204	521	134	786	648
V/C Ratio(X)	0.46	0.00	0.08	0.46	0.06	0.44	0.44	0.37	0.02	0.65	0.71	0.04
Avail Cap(c_a), veh/h	247	0	674	247	792	651	247	1924	833	394	1206	994
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	16.8	20.2	16.7	17.5	20.4	10.3	9.1	18.8	9.9	7.0
Incr Delay (d2), s/veh	7.4	0.0	0.2	7.4	0.1	1.8	10.7	0.2	0.0	5.3	1.2	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	0.2	0.3	0.1	0.9	0.2	1.9	0.1	1.2	5.5	0.2
LnGrp Delay(d),s/veh	27.5	0.0	17.0	27.5	16.9	19.3	31.1	10.5	9.1	24.1	11.1	7.0
LnGrp LOS	C		B	C	B	B	C	B	A	C	B	A
Approach Vol, veh/h		34			105			465			669	
Approach Delay, s/veh		23.2			20.6			11.0			12.7	
Approach LOS		C			C			B			B	

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	8.1	19.3	5.0	9.5	4.7	22.7	5.0	9.5
Change Period (Y+Rc), s	4.9	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	9.4	23.0	5.9	18.0	5.9	27.4	5.9	18.0
Max Q Clear Time (g_c+I1), s	4.0	6.0	2.5	2.3	2.3	12.4	2.5	3.9
Green Ext Time (p_c), s	0.1	5.7	0.0	0.3	0.0	5.4	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	14	20	12	73	12	443	10	88	558	23
v/c Ratio	0.08	0.06	0.08	0.04	0.21	0.05	0.22	0.01	0.26	0.41	0.02
Control Delay	22.0	15.5	22.0	21.2	2.1	21.8	10.6	0.0	20.3	8.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	15.5	22.0	21.2	2.1	21.8	10.6	0.0	20.3	8.2	0.0
Queue Length 50th (ft)	4	1	4	2	0	2	40	0	16	53	0
Queue Length 95th (ft)	26	16	26	18	6	19	98	0	69	277	0
Internal Link Dist (ft)		904		874			1832			2179	
Turn Bay Length (ft)	250		1			270		200	250		
Base Capacity (vph)	270	760	270	869	798	270	2455	1101	431	1384	1171
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.02	0.07	0.01	0.09	0.04	0.18	0.01	0.20	0.40	0.02

Intersection Summary

Intersection	
Int Delay, s/veh	66.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	21	32	25	176	76	23	34	326	136	58	419	24
Future Vol, veh/h	21	32	25	176	76	23	34	326	136	58	419	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	32	25	178	77	23	34	329	137	59	423	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1079	1097	445	1058	1041	408	452	0	0	471	0	0
Stage 1	558	558	-	471	471	-	-	-	-	-	-	-
Stage 2	521	539	-	587	570	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	195	212	611	202	229	641	1103	-	-	1086	-	-
Stage 1	512	510	-	571	558	-	-	-	-	-	-	-
Stage 2	537	520	-	494	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	125	192	605	~ 157	208	635	1098	-	-	1081	-	-
Mov Cap-2 Maneuver	125	192	-	~ 157	208	-	-	-	-	-	-	-
Stage 1	494	479	-	550	538	-	-	-	-	-	-	-
Stage 2	428	501	-	415	474	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.7	$ 313.1	0.6	1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1098	-	-	207	181	1081	-	-
HCM Lane V/C Ratio	0.031	-	-	0.381	1.535	0.054	-	-
HCM Control Delay (s)	8.4	-	-	32.7	$ 313.1	8.5	-	-
HCM Lane LOS	A	-	-	D	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	17.9	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	0	0	62	92	386	48	108	500	21
Future Vol, veh/h	0	0	31	0	0	62	92	386	48	108	500	21
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	92	96	92	92	92	96	96	92	92	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	32	0	0	67	96	402	52	117	521	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	282	-	-	428	548	0	0	454	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	713	0	0	623	1014	-	-	1099	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	706	-	-	623	1009	-	-	1099	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	11.5	1.6	1.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1009	-	-	706	623	1099	-	-
HCM Lane V/C Ratio	0.095	-	-	0.046	0.108	0.107	-	-
HCM Control Delay (s)	8.9	-	-	10.3	11.5	8.7	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	0.4	0.4	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	19	1	27	1	1	1	42	435	1	94	464	24
Future Vol, veh/h	19	1	27	1	1	1	42	435	1	94	464	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	20	1	28	1	1	1	44	453	1	98	483	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1245	1244	506	1258	1256	464	513	0	0	459	0	0
Stage 1	697	697	-	547	547	-	-	-	-	-	-	-
Stage 2	548	547	-	711	709	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	150	173	564	147	171	596	1047	-	-	1097	-	-
Stage 1	430	441	-	519	516	-	-	-	-	-	-	-
Stage 2	519	516	-	422	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	133	149	559	124	148	590	1042	-	-	1092	-	-
Mov Cap-2 Maneuver	133	149	-	124	148	-	-	-	-	-	-	-
Stage 1	410	399	-	495	492	-	-	-	-	-	-	-
Stage 2	493	492	-	362	395	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24	25.1	0.8	1.4
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1042	-	-	238	182	1092	-	-
HCM Lane V/C Ratio	0.042	-	-	0.206	0.017	0.09	-	-
HCM Control Delay (s)	8.6	-	-	24	25.1	8.6	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.1	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	352	26	74	470	180	16	191	62	207	185	96
Future Volume (veh/h)	114	352	26	74	470	180	16	191	62	207	185	96
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		0.97	1.00		0.98	1.00		0.97	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	123	378	28	80	505	194	17	205	67	223	199	103
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	150	722	53	102	505	194	33	233	76	254	557	457
Arrive On Green	0.09	0.43	0.43	0.06	0.40	0.40	0.02	0.18	0.18	0.15	0.30	0.30
Sat Flow, veh/h	1740	1676	124	1740	1251	481	1740	1310	428	1740	1827	1500
Grp Volume(v), veh/h	123	0	406	80	0	699	17	0	272	223	199	103
Grp Sat Flow(s),veh/h/ln	1740	0	1800	1740	0	1732	1740	0	1738	1740	1827	1500
Q Serve(g_s), s	6.6	0.0	15.8	4.3	0.0	38.5	0.9	0.0	14.6	12.0	8.1	4.9
Cycle Q Clear(g_c), s	6.6	0.0	15.8	4.3	0.0	38.5	0.9	0.0	14.6	12.0	8.1	4.9
Prop In Lane	1.00		0.07	1.00		0.28	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	150	0	776	102	0	699	33	0	309	254	557	457
V/C Ratio(X)	0.82	0.00	0.52	0.78	0.00	1.00	0.51	0.00	0.88	0.88	0.36	0.23
Avail Cap(c_a), veh/h	150	0	776	184	0	699	108	0	337	255	557	457
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	1.00	1.00
Uniform Delay (d), s/veh	42.9	0.0	20.0	44.3	0.0	28.4	46.4	0.0	38.2	39.9	25.9	24.7
Incr Delay (d2), s/veh	29.4	0.0	0.6	12.2	0.0	34.1	11.8	0.0	21.5	27.2	0.4	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	4.4	0.0	7.9	2.4	0.0	24.9	0.6	0.0	8.8	7.7	4.2	2.0
LnGrp Delay(d),s/veh	72.3	0.0	20.6	56.5	0.0	62.5	58.2	0.0	59.7	67.1	26.3	25.0
LnGrp LOS	E		C	E		F	E		E	E	C	C
Approach Vol, veh/h		529			779			289			525	
Approach Delay, s/veh		32.6			61.9			59.6			43.3	
Approach LOS		C			E			E			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	17.9	21.9	9.6	46.0	5.8	34.0	12.2	43.4
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	14.0	18.5	10.1	36.6	5.9	26.6	8.2	38.5
Max Q Clear Time (g_c+I1), s	14.0	16.6	6.3	17.8	2.9	10.1	8.6	40.5
Green Ext Time (p_c), s	0.0	0.3	0.0	6.6	0.0	2.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	123	406	80	699	17	272	223	199	103
v/c Ratio	0.83	0.53	0.50	0.98	0.16	0.84	0.89	0.34	0.18
Control Delay	84.3	25.5	52.6	57.2	46.9	59.1	76.2	27.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.3	25.5	52.6	57.2	46.9	59.1	76.2	27.7	5.7
Queue Length 50th (ft)	76	195	47	410	10	153	137	85	0
Queue Length 95th (ft)	#178	294	94	#661	32	#278	#272	164	35
Internal Link Dist (ft)		2439		7910		2074		1196	
Turn Bay Length (ft)	350		350		200		170		150
Base Capacity (vph)	149	759	183	716	107	351	255	592	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.53	0.44	0.98	0.16	0.77	0.87	0.34	0.18

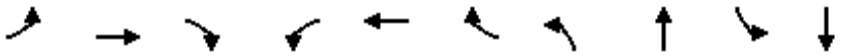
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	792	83	476	1025	311	55	67	424	199	105	25
Future Volume (veh/h)	38	792	83	476	1025	311	55	67	424	199	105	25
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		0.93	1.00		0.95	1.00		0.95	1.00		0.93
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	40	834	87	501	1079	327	58	71	446	209	111	26
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	58	890	370	480	912	739	74	39	244	187	354	83
Arrive On Green	0.03	0.26	0.26	0.28	0.50	0.50	0.04	0.19	0.19	0.11	0.25	0.25
Sat Flow, veh/h	1740	3471	1441	1740	1827	1480	1740	207	1302	1740	1408	330
Grp Volume(v), veh/h	40	834	87	501	1079	327	58	0	517	209	0	137
Grp Sat Flow(s),veh/h/ln	1740	1736	1441	1740	1827	1480	1740	0	1509	1740	0	1738
Q Serve(g_s), s	2.3	24.1	4.9	28.3	51.2	14.6	3.4	0.0	19.2	11.0	0.0	6.6
Cycle Q Clear(g_c), s	2.3	24.1	4.9	28.3	51.2	14.6	3.4	0.0	19.2	11.0	0.0	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.86	1.00		0.19
Lane Grp Cap(c), veh/h	58	890	370	480	912	739	74	0	282	187	0	437
V/C Ratio(X)	0.69	0.94	0.24	1.04	1.18	0.44	0.78	0.00	1.83	1.12	0.00	0.31
Avail Cap(c_a), veh/h	100	903	375	480	912	739	154	0	282	187	0	437
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.1	37.3	30.2	37.2	25.7	16.5	48.6	0.0	41.7	45.8	0.0	31.2
Incr Delay (d2), s/veh	13.9	16.7	0.3	53.0	93.7	0.4	16.1	0.0	387.7	102.0	0.0	0.4
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	1.3	13.6	2.0	20.5	49.3	6.0	2.0	0.0	38.3	10.5	0.0	3.2
LnGrp Delay(d),s/veh	63.0	54.0	30.5	90.2	119.4	16.9	64.7	0.0	429.4	147.8	0.0	31.6
LnGrp LOS	E	D	C	F	F	B	E		F	F		C
Approach Vol, veh/h		961			1907			575			346	
Approach Delay, s/veh		52.2			94.2			392.6			101.8	
Approach LOS		D			F			F			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	15.0	24.1	32.3	31.2	8.4	30.7	7.4	56.1
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	11.0	19.2	28.3	26.7	9.1	21.1	5.9	49.1
Max Q Clear Time (g_c+I1), s	13.0	21.2	30.3	26.1	5.4	8.6	4.3	53.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.2	0.0	3.8	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	129.5
HCM 2010 LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	834	87	501	1079	327	58	517	209	137
v/c Ratio	0.41	0.93	0.18	1.05	1.15	0.40	0.43	1.03	1.13	0.33
Control Delay	59.7	55.7	1.6	92.4	106.0	8.7	55.1	69.3	147.6	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	55.7	1.6	92.4	106.0	8.7	55.1	69.3	147.6	34.5
Queue Length 50th (ft)	26	282	0	~361	~885	54	37	~209	~160	72
Queue Length 95th (ft)	62	#401	6	#562	#1132	121	78	#416	#306	130
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	99	901	476	477	939	820	153	502	185	417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.93	0.18	1.05	1.15	0.40	0.38	1.03	1.13	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	4	14	11	15	148	6	475	5	69	316	22
Future Volume (veh/h)	27	4	14	11	15	148	6	475	5	69	316	22
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		0.96	1.00		0.97	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	29	4	15	12	16	161	7	516	5	75	343	24
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	60	60	224	27	300	248	16	1010	436	124	644	530
Arrive On Green	0.03	0.18	0.18	0.02	0.16	0.16	0.01	0.29	0.29	0.07	0.35	0.35
Sat Flow, veh/h	1757	329	1232	1757	1845	1524	1757	3505	1513	1757	1845	1517
Grp Volume(v), veh/h	29	0	19	12	16	161	7	516	5	75	343	24
Grp Sat Flow(s),veh/h/ln	1757	0	1561	1757	1845	1524	1757	1752	1513	1757	1845	1517
Q Serve(g_s), s	0.6	0.0	0.4	0.3	0.3	4.0	0.2	4.9	0.1	1.7	6.0	0.4
Cycle Q Clear(g_c), s	0.6	0.0	0.4	0.3	0.3	4.0	0.2	4.9	0.1	1.7	6.0	0.4
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	0	283	27	300	248	16	1010	436	124	644	530
V/C Ratio(X)	0.48	0.00	0.07	0.44	0.05	0.65	0.43	0.51	0.01	0.60	0.53	0.05
Avail Cap(c_a), veh/h	263	0	705	259	828	685	259	1749	755	359	1026	844
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	13.6	19.6	14.2	15.7	19.7	11.9	10.2	18.1	10.4	8.6
Incr Delay (d2), s/veh	5.8	0.0	0.1	10.6	0.1	2.8	16.5	0.4	0.0	4.7	0.7	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	0.4	0.0	0.2	0.2	0.2	1.9	0.2	2.4	0.0	1.0	3.1	0.2
LnGrp Delay(d),s/veh	24.8	0.0	13.7	30.2	14.2	18.6	36.3	12.3	10.2	22.7	11.1	8.7
LnGrp LOS	C		B	C	B	B	D	B	B	C	B	A
Approach Vol, veh/h		48			189			528			442	
Approach Delay, s/veh		20.4			18.9			12.6			12.9	
Approach LOS		C			B			B			B	

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	6.8	16.4	4.6	12.2	4.4	18.9	5.4	11.4
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	8.2	20.0	5.9	18.1	5.9	22.3	6.0	18.0
Max Q Clear Time (g_c+I1), s	3.7	6.9	2.3	2.4	2.2	8.0	2.6	6.0
Green Ext Time (p_c), s	0.0	4.2	0.0	0.6	0.0	4.4	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	29	19	12	16	161	7	516	5	75	343	24
v/c Ratio	0.11	0.06	0.05	0.05	0.41	0.03	0.31	0.01	0.24	0.32	0.03
Control Delay	23.6	11.9	23.5	20.7	8.4	23.5	13.1	0.0	22.3	10.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	11.9	23.5	20.7	8.4	23.5	13.1	0.0	22.3	10.2	0.0
Queue Length 50th (ft)	5	1	2	3	0	1	45	0	13	28	0
Queue Length 95th (ft)	32	17	18	20	44	13	121	0	61	171	0
Internal Link Dist (ft)		904		874			1832			2179	
Turn Bay Length (ft)	250		1			270		200	250		
Base Capacity (vph)	278	765	274	880	815	274	2023	938	380	1124	981
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.02	0.04	0.02	0.20	0.03	0.26	0.01	0.20	0.31	0.02

Intersection Summary

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	21	65	44	73	25	28	17	414	88	38	286	9
Future Vol, veh/h	21	65	44	73	25	28	17	414	88	38	286	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	23	71	48	79	27	30	18	450	96	41	311	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	971	990	326	1002	947	508	326	0	0	551	0	0
Stage 1	403	403	-	539	539	-	-	-	-	-	-	-
Stage 2	568	587	-	463	408	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	231	245	713	220	260	563	1228	-	-	1014	-	-
Stage 1	622	598	-	525	520	-	-	-	-	-	-	-
Stage 2	506	495	-	577	595	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	190	229	706	149	243	558	1222	-	-	1009	-	-
Mov Cap-2 Maneuver	190	229	-	149	243	-	-	-	-	-	-	-
Stage 1	610	570	-	515	510	-	-	-	-	-	-	-
Stage 2	444	485	-	450	568	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.4	57.4	0.3	1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1222	-	-	285	196	1009	-	-
HCM Lane V/C Ratio	0.015	-	-	0.496	0.699	0.041	-	-
HCM Control Delay (s)	8	-	-	29.4	57.4	8.7	-	-
HCM Lane LOS	A	-	-	D	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.6	4.4	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	39	0	0	53	56	442	6	13	375	6
Future Vol, veh/h	0	0	39	0	0	53	56	442	6	13	375	6
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	42	0	0	58	61	480	7	14	408	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	218	-	-	484	420	0	0	487	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	784	0	0	579	1131	-	-	1068	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	777	-	-	579	1126	-	-	1068	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	11.9	0.9	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1126	-	-	777	579	1068	-	-
HCM Lane V/C Ratio	0.054	-	-	0.055	0.099	0.013	-	-
HCM Control Delay (s)	8.4	-	-	9.9	11.9	8.4	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.3	0	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	25	1	36	1	1	1	13	379	3	37	436	5
Future Vol, veh/h	25	1	36	1	1	1	13	379	3	37	436	5
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	27	1	39	1	1	1	14	412	3	40	474	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1010	1010	487	1029	1011	424	484	0	0	420	0	0
Stage 1	562	562	-	447	447	-	-	-	-	-	-	-
Stage 2	448	448	-	582	564	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	217	239	579	211	239	628	1074	-	-	1134	-	-
Stage 1	510	508	-	589	572	-	-	-	-	-	-	-
Stage 2	588	571	-	497	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	206	225	573	187	225	622	1069	-	-	1129	-	-
Mov Cap-2 Maneuver	206	225	-	187	225	-	-	-	-	-	-	-
Stage 1	501	488	-	578	562	-	-	-	-	-	-	-
Stage 2	575	561	-	444	487	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.7	18.9	0.3	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1069	-	-	329	263	1129	-	-
HCM Lane V/C Ratio	0.013	-	-	0.205	0.012	0.036	-	-
HCM Control Delay (s)	8.4	-	-	18.7	18.9	8.3	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	441	18	48	334	101	27	146	79	249	209	111
Future Volume (veh/h)	86	441	18	48	334	101	27	146	79	249	209	111
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		0.97	1.00		0.97	1.00		0.97	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	93	479	20	52	363	110	29	159	86	271	227	121
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	119	611	25	76	436	132	52	211	114	316	626	515
Arrive On Green	0.07	0.35	0.35	0.04	0.33	0.33	0.03	0.19	0.19	0.18	0.34	0.34
Sat Flow, veh/h	1740	1739	73	1740	1335	404	1740	1105	598	1740	1827	1502
Grp Volume(v), veh/h	93	0	499	52	0	473	29	0	245	271	227	121
Grp Sat Flow(s),veh/h/ln	1740	0	1811	1740	0	1739	1740	0	1703	1740	1827	1502
Q Serve(g_s), s	4.0	0.0	18.9	2.3	0.0	19.3	1.3	0.0	10.4	11.6	7.1	4.4
Cycle Q Clear(g_c), s	4.0	0.0	18.9	2.3	0.0	19.3	1.3	0.0	10.4	11.6	7.1	4.4
Prop In Lane	1.00		0.04	1.00		0.23	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	119	0	636	76	0	568	52	0	325	316	626	515
V/C Ratio(X)	0.78	0.00	0.78	0.68	0.00	0.83	0.55	0.00	0.75	0.86	0.36	0.23
Avail Cap(c_a), veh/h	195	0	782	136	0	692	136	0	447	454	813	668
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	1.00	1.00
Uniform Delay (d), s/veh	35.2	0.0	22.3	36.1	0.0	23.9	36.7	0.0	29.3	30.4	18.9	18.0
Incr Delay (d2), s/veh	10.6	0.0	4.3	10.3	0.0	7.2	8.9	0.0	4.7	10.7	0.4	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	2.3	0.0	10.2	1.3	0.0	10.3	0.7	0.0	5.3	6.5	3.7	1.8
LnGrp Delay(d),s/veh	45.8	0.0	26.5	46.5	0.0	31.1	45.5	0.0	34.0	41.1	19.3	18.2
LnGrp LOS	D		C	D		C	D		C	D	B	B
Approach Vol, veh/h		592			525			274			619	
Approach Delay, s/veh		29.6			32.6			35.2			28.6	
Approach LOS		C			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	17.9	19.5	7.3	31.8	6.3	31.2	9.2	29.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	20.0	20.1	6.0	33.1	6.0	34.1	8.6	30.5
Max Q Clear Time (g_c+I1), s	13.6	12.4	4.3	20.9	3.3	9.1	6.0	21.3
Green Ext Time (p_c), s	0.4	1.8	0.0	4.4	0.0	3.0	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	30.9
HCM 2010 LOS	C



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	499	52	473	29	245	271	227	121
v/c Ratio	0.53	0.76	0.40	0.85	0.22	0.71	0.75	0.32	0.19
Control Delay	53.5	34.4	52.5	43.4	47.1	43.2	48.5	23.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	34.4	52.5	43.4	47.1	43.2	48.5	23.2	5.2
Queue Length 50th (ft)	54	262	31	250	17	125	152	103	0
Queue Length 95th (ft)	#122	#441	#75	#436	46	209	#275	165	37
Internal Link Dist (ft)		2439		7910		2074		1196	
Turn Bay Length (ft)	350		350		200		170		150
Base Capacity (vph)	192	794	134	698	134	464	448	805	725
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.63	0.39	0.68	0.22	0.53	0.60	0.28	0.17

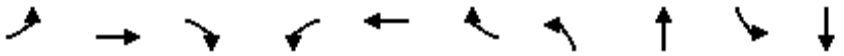
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	885	72	290	635	102	52	52	536	259	43	11
Future Volume (veh/h)	35	885	72	290	635	102	52	52	536	259	43	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		0.93	1.00		0.95	1.00		0.96	1.00		0.94
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	38	962	78	315	690	111	57	57	583	282	47	12
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	56	913	380	287	723	582	73	34	349	253	495	126
Arrive On Green	0.03	0.26	0.26	0.17	0.40	0.40	0.04	0.25	0.25	0.15	0.36	0.36
Sat Flow, veh/h	1740	3471	1443	1740	1827	1469	1740	135	1376	1740	1385	354
Grp Volume(v), veh/h	38	962	78	315	690	111	57	0	640	282	0	59
Grp Sat Flow(s),veh/h/ln	1740	1736	1443	1740	1827	1469	1740	0	1510	1740	0	1739
Q Serve(g_s), s	2.2	27.1	4.3	17.0	37.8	5.1	3.3	0.0	26.1	15.0	0.0	2.3
Cycle Q Clear(g_c), s	2.2	27.1	4.3	17.0	37.8	5.1	3.3	0.0	26.1	15.0	0.0	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.91	1.00		0.20
Lane Grp Cap(c), veh/h	56	913	380	287	723	582	73	0	383	253	0	621
V/C Ratio(X)	0.68	1.05	0.21	1.10	0.95	0.19	0.78	0.00	1.67	1.11	0.00	0.10
Avail Cap(c_a), veh/h	100	913	380	287	723	582	152	0	383	253	0	621
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	38.0	29.6	43.0	30.2	20.3	48.9	0.0	38.5	44.0	0.0	22.0
Incr Delay (d2), s/veh	13.4	44.8	0.3	81.5	22.8	0.2	16.4	0.0	313.8	90.2	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	1.3	18.6	1.8	14.6	23.5	2.1	1.9	0.0	44.2	13.5	0.0	1.1
LnGrp Delay(d),s/veh	62.7	82.8	29.8	124.5	52.9	20.5	65.2	0.0	352.3	134.2	0.0	22.1
LnGrp LOS	E	F	C	F	D	C	E		F	F		C
Approach Vol, veh/h		1078			1116			697			341	
Approach Delay, s/veh		78.3			69.9			328.8			114.8	
Approach LOS		E			E			F			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	19.0	31.0	21.0	32.0	8.3	41.7	7.3	45.7
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	15.0	26.1	17.0	27.1	9.0	32.1	5.9	38.2
Max Q Clear Time (g_c+I1), s	17.0	28.1	19.0	29.1	5.3	4.3	4.2	39.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	133.3
HCM 2010 LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	962	78	315	690	111	57	640	282	59
v/c Ratio	0.39	1.05	0.15	1.10	0.92	0.17	0.43	1.06	1.12	0.10
Control Delay	58.7	82.5	0.6	124.5	50.1	2.2	55.1	76.6	134.1	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	82.5	0.6	124.5	50.1	2.2	55.1	76.6	134.1	21.5
Queue Length 50th (ft)	25	~365	0	~236	~467	0	36	~309	~214	22
Queue Length 95th (ft)	59	#493	0	#407	#705	19	77	#529	#378	52
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	99	913	512	286	747	668	151	601	252	600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.05	0.15	1.10	0.92	0.17	0.38	1.06	1.12	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	4	9	18	11	67	11	386	9	81	474	21
Future Volume (veh/h)	18	4	9	18	11	67	11	386	9	81	474	21
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		0.95	1.00		0.97	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	20	4	10	20	12	73	12	420	10	88	515	23
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	44	50	126	44	207	170	27	1169	506	138	731	602
Arrive On Green	0.02	0.11	0.11	0.02	0.11	0.11	0.02	0.33	0.33	0.08	0.40	0.40
Sat Flow, veh/h	1757	449	1123	1757	1845	1517	1757	3505	1516	1757	1845	1520
Grp Volume(v), veh/h	20	0	14	20	12	73	12	420	10	88	515	23
Grp Sat Flow(s),veh/h/ln	1757	0	1572	1757	1845	1517	1757	1752	1516	1757	1845	1520
Q Serve(g_s), s	0.4	0.0	0.3	0.4	0.2	1.8	0.3	3.6	0.2	1.9	9.2	0.4
Cycle Q Clear(g_c), s	0.4	0.0	0.3	0.4	0.2	1.8	0.3	3.6	0.2	1.9	9.2	0.4
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	0	176	44	207	170	27	1169	506	138	731	602
V/C Ratio(X)	0.46	0.00	0.08	0.46	0.06	0.43	0.44	0.36	0.02	0.64	0.70	0.04
Avail Cap(c_a), veh/h	263	0	717	263	841	692	263	1705	738	405	1047	862
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	15.7	19.0	15.7	16.3	19.3	10.0	8.8	17.6	10.0	7.3
Incr Delay (d2), s/veh	7.2	0.0	0.2	7.2	0.1	1.7	10.6	0.2	0.0	4.8	1.3	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	0.1	0.3	0.1	0.8	0.2	1.7	0.1	1.1	4.8	0.2
LnGrp Delay(d),s/veh	26.2	0.0	15.9	26.2	15.8	18.1	29.8	10.1	8.8	22.5	11.2	7.3
LnGrp LOS	C		B	C	B	B	C	B	A	C	B	A
Approach Vol, veh/h		34			105			442			626	
Approach Delay, s/veh		22.0			19.3			10.6			12.7	
Approach LOS		C			B			B			B	

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	7.1	18.1	5.0	9.3	4.6	20.5	5.0	9.3
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	9.1	19.2	5.9	18.0	5.9	22.4	5.9	18.0
Max Q Clear Time (g_c+I1), s	3.9	5.6	2.4	2.3	2.3	11.2	2.4	3.8
Green Ext Time (p_c), s	0.1	4.8	0.0	0.3	0.0	4.3	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	14	20	12	73	12	420	10	88	515	23
v/c Ratio	0.07	0.05	0.07	0.04	0.20	0.04	0.21	0.01	0.26	0.39	0.02
Control Delay	19.9	14.2	19.9	19.3	1.5	19.8	10.5	0.0	18.6	9.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	14.2	19.9	19.3	1.5	19.8	10.5	0.0	18.6	9.1	0.0
Queue Length 50th (ft)	3	1	3	2	0	2	36	0	15	47	0
Queue Length 95th (ft)	24	15	24	17	4	17	91	0	64	#267	0
Internal Link Dist (ft)		904		874			1832			2179	
Turn Bay Length (ft)	250		1			270		200	250		
Base Capacity (vph)	284	798	284	913	836	284	2347	1063	438	1323	1129
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.02	0.07	0.01	0.09	0.04	0.18	0.01	0.20	0.39	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	24.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	21	32	24	122	76	23	34	304	104	58	380	24
Future Vol, veh/h	21	32	24	122	76	23	34	304	104	58	380	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	300	-	-	270	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	32	24	123	77	23	34	307	105	59	384	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1002	1004	406	980	964	370	413	0	0	417	0	0
Stage 1	519	519	-	433	433	-	-	-	-	-	-	-
Stage 2	483	485	-	547	531	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	220	241	643	228	254	673	1141	-	-	1137	-	-
Stage 1	538	531	-	599	580	-	-	-	-	-	-	-
Stage 2	563	550	-	519	524	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	147	219	637	181	231	667	1136	-	-	1132	-	-
Mov Cap-2 Maneuver	147	219	-	181	231	-	-	-	-	-	-	-
Stage 1	519	501	-	578	560	-	-	-	-	-	-	-
Stage 2	453	531	-	441	494	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.6	122.6	0.6	1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1136	-	-	236	213	1132	-	-
HCM Lane V/C Ratio	0.03	-	-	0.33	1.048	0.052	-	-
HCM Control Delay (s)	8.3	-	-	27.6	122.6	8.4	-	-
HCM Lane LOS	A	-	-	D	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.4	9.8	0.2	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	0	0	26	60	368	20	45	468	21
Future Vol, veh/h	0	0	31	0	0	26	60	368	20	45	468	21
Conflicting Peds, #/hr	5	0	5	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	92	96	92	92	92	96	96	92	92	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	32	0	0	28	63	383	22	49	488	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	265	-	-	394	515	0	0	405	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.945	-	-	6.245	4.145	-	-	4.145	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3285	-	-	3.3285	2.2285	-	-	2.2285	-	-
Pot Cap-1 Maneuver	0	0	731	0	0	652	1043	-	-	1146	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	724	-	-	652	1038	-	-	1146	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	10.8	1.2	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1038	-	-	724	652	1146	-	-
HCM Lane V/C Ratio	0.06	-	-	0.045	0.043	0.043	-	-
HCM Control Delay (s)	8.7	-	-	10.2	10.8	8.3	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	19	1	27	1	1	1	42	379	1	62	432	24
Future Vol, veh/h	19	1	27	1	1	1	42	379	1	62	432	24
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	20	1	28	1	1	1	44	395	1	65	450	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1088	1087	473	1101	1099	406	480	0	0	401	0	0
Stage 1	598	598	-	489	489	-	-	-	-	-	-	-
Stage 2	490	489	-	612	610	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	192	215	589	188	212	643	1077	-	-	1152	-	-
Stage 1	487	489	-	559	548	-	-	-	-	-	-	-
Stage 2	558	548	-	479	483	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	175	192	583	164	190	637	1072	-	-	1147	-	-
Mov Cap-2 Maneuver	175	192	-	164	190	-	-	-	-	-	-	-
Stage 1	465	459	-	533	523	-	-	-	-	-	-	-
Stage 2	531	523	-	427	453	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	20.7	0.8	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1072	-	-	294	232	1147	-	-
HCM Lane V/C Ratio	0.041	-	-	0.167	0.013	0.056	-	-
HCM Control Delay (s)	8.5	-	-	19.7	20.7	8.3	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	352	26	74	470	156	16	167	62	193	171	92
Future Volume (veh/h)	106	352	26	74	470	156	16	167	62	193	171	92
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		0.97	1.00		0.98	1.00		0.97	1.00		0.97
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	1827	1827	1900	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	114	378	28	80	505	168	17	180	67	208	184	99
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	142	719	53	102	530	176	33	223	83	241	541	444
Arrive On Green	0.08	0.43	0.43	0.06	0.41	0.41	0.02	0.18	0.18	0.14	0.30	0.30
Sat Flow, veh/h	1740	1676	124	1740	1306	435	1740	1260	469	1740	1827	1499
Grp Volume(v), veh/h	114	0	406	80	0	673	17	0	247	208	184	99
Grp Sat Flow(s),veh/h/ln	1740	0	1800	1740	0	1741	1740	0	1729	1740	1827	1499
Q Serve(g_s), s	5.8	0.0	15.0	4.1	0.0	33.9	0.9	0.0	12.4	10.6	7.1	4.5
Cycle Q Clear(g_c), s	5.8	0.0	15.0	4.1	0.0	33.9	0.9	0.0	12.4	10.6	7.1	4.5
Prop In Lane	1.00		0.07	1.00		0.25	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	142	0	772	102	0	707	33	0	306	241	541	444
V/C Ratio(X)	0.80	0.00	0.53	0.78	0.00	0.95	0.51	0.00	0.81	0.86	0.34	0.22
Avail Cap(c_a), veh/h	154	0	772	194	0	733	113	0	384	250	549	451
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	1.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	19.1	42.0	0.0	26.0	43.9	0.0	35.7	38.1	24.9	24.0
Incr Delay (d2), s/veh	24.1	0.0	0.7	12.1	0.0	21.9	11.4	0.0	9.7	24.7	0.4	0.3
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	3.7	0.0	7.6	2.3	0.0	20.6	0.5	0.0	6.7	6.7	3.6	1.9
LnGrp Delay(d),s/veh	64.9	0.0	19.7	54.1	0.0	47.9	55.4	0.0	45.5	62.8	25.3	24.2
LnGrp LOS	E		B	D		D	E		D	E	C	C
Approach Vol, veh/h		520			753			264			491	
Approach Delay, s/veh		29.6			48.6			46.1			41.0	
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	16.5	20.9	9.3	43.7	5.7	31.7	11.4	41.6
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	13.0	20.1	10.1	36.0	5.9	27.2	8.0	38.1
Max Q Clear Time (g_c+I1), s	12.6	14.4	6.1	17.0	2.9	9.1	7.8	35.9
Green Ext Time (p_c), s	0.0	1.3	0.0	6.4	0.0	2.5	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	41.5
HCM 2010 LOS	D



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	114	406	80	673	17	247	208	184	99
v/c Ratio	0.75	0.54	0.49	0.95	0.16	0.76	0.86	0.31	0.18
Control Delay	73.5	25.4	51.4	50.9	46.4	49.4	72.0	27.0	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.5	25.4	51.4	50.9	46.4	49.4	72.0	27.0	5.3
Queue Length 50th (ft)	68	188	46	371	10	131	124	77	0
Queue Length 95th (ft)	#165	297	94	#630	32	215	#261	152	32
Internal Link Dist (ft)		2439		7910		2074		1196	
Turn Bay Length (ft)	350		350		200		170		150
Base Capacity (vph)	151	755	191	739	111	395	246	589	556
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.54	0.42	0.91	0.15	0.63	0.85	0.31	0.18

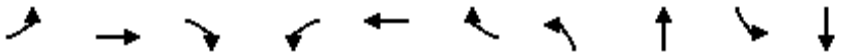
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	778	83	476	1001	311	55	67	424	199	105	25
Future Volume (veh/h)	38	778	83	476	1001	311	55	67	424	199	105	25
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		0.93	1.00		0.95	1.00		0.95	1.00		0.93
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	1827	1827	1827	1827	1827	1827	1827	1827	1900	1827	1827	1900
Adj Flow Rate, veh/h	40	819	87	501	1054	327	58	71	446	209	111	26
Adj No. of Lanes	1	2	1	1	1	1	1	1	0	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	58	880	365	482	908	736	74	39	244	187	356	83
Arrive On Green	0.03	0.25	0.25	0.28	0.50	0.50	0.04	0.19	0.19	0.11	0.25	0.25
Sat Flow, veh/h	1740	3471	1440	1740	1827	1480	1740	207	1302	1740	1408	330
Grp Volume(v), veh/h	40	819	87	501	1054	327	58	0	517	209	0	137
Grp Sat Flow(s),veh/h/ln	1740	1736	1440	1740	1827	1480	1740	0	1509	1740	0	1738
Q Serve(g_s), s	2.3	23.6	4.9	28.3	50.8	14.6	3.4	0.0	19.2	11.0	0.0	6.5
Cycle Q Clear(g_c), s	2.3	23.6	4.9	28.3	50.8	14.6	3.4	0.0	19.2	11.0	0.0	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.86	1.00		0.19
Lane Grp Cap(c), veh/h	58	880	365	482	908	736	74	0	283	187	0	439
V/C Ratio(X)	0.69	0.93	0.24	1.04	1.16	0.44	0.78	0.00	1.82	1.12	0.00	0.31
Avail Cap(c_a), veh/h	100	907	376	482	908	736	155	0	283	187	0	439
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.9	37.3	30.3	37.0	25.7	16.6	48.5	0.0	41.5	45.6	0.0	31.0
Incr Delay (d2), s/veh	13.8	15.5	0.3	51.8	84.4	0.4	16.1	0.0	384.5	100.4	0.0	0.4
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	1.3	13.2	2.0	20.4	46.8	6.0	2.0	0.0	38.2	10.5	0.0	3.2
LnGrp Delay(d),s/veh	62.7	52.8	30.6	88.8	110.1	17.0	64.5	0.0	426.0	146.0	0.0	31.4
LnGrp LOS	E	D	C	F	F	B	E		F	F		C
Approach Vol, veh/h		946			1882			575			346	
Approach Delay, s/veh		51.2			88.2			389.5			100.6	
Approach LOS		D			F			F			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	15.0	24.1	32.3	30.8	8.4	30.7	7.4	55.7
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	11.0	19.2	28.3	26.7	9.1	21.1	5.9	49.1
Max Q Clear Time (g_c+I1), s	13.0	21.2	30.3	25.6	5.4	8.5	4.3	52.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.0	3.8	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	126.2
HCM 2010 LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	819	87	501	1054	327	58	517	209	137
v/c Ratio	0.41	0.92	0.18	1.05	1.12	0.40	0.43	1.03	1.12	0.33
Control Delay	59.6	54.0	1.6	91.8	96.3	8.5	55.0	69.1	146.7	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.6	54.0	1.6	91.8	96.3	8.5	55.0	69.1	146.7	34.5
Queue Length 50th (ft)	26	275	0	~361	~851	52	37	~209	~160	72
Queue Length 95th (ft)	62	#388	6	#562	#1097	119	78	#416	#306	130
Internal Link Dist (ft)		7910			1209			1301		428
Turn Bay Length (ft)	200			200		200	120		120	
Base Capacity (vph)	99	903	476	478	937	821	154	502	186	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.91	0.18	1.05	1.12	0.40	0.38	1.03	1.12	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Peak-Hour Traffic Signal Warrants

Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Existing

Intersection Information

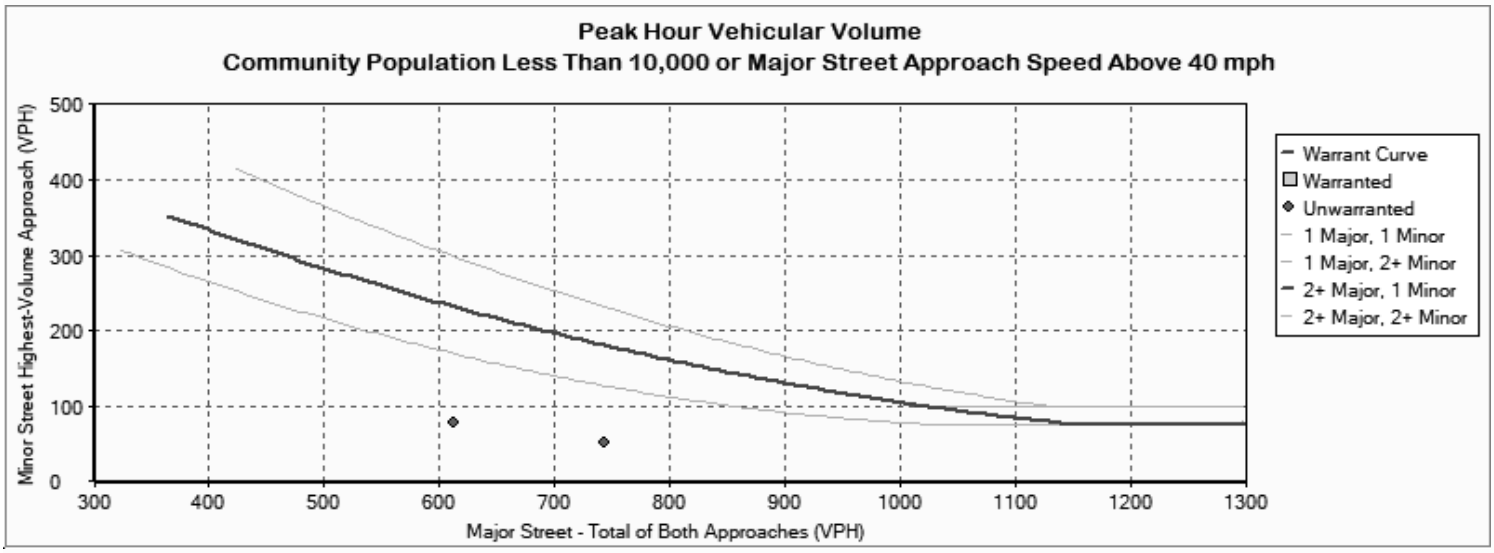
	Major Street	Minor Street
Street Name	Grantland Ave	Barstow Ave
Direction	NB/SB	EB/WB
Number of Lanes	2	1
Approch Speed	45	30

Warrant 3 Met? **No**

Details

Low Population?	No		
Condition A Met	No	**Condition B Met**	No
Notes	0 Hours met (1 required)	**Notes**	0 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Existing

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:30	613	79
17:00	744	52

Warrant 3: Peak Hour

1: Grantland Ave & Bullard Ave - Existing

Intersection Information

	Major Street	Minor Street
Street Name	Grantland Ave	Bullard Ave
Direction	NB/SB	EB/WB
Number of Lanes	2	2
Approch Speed	45	30

Warrant 3 Met? **Yes**

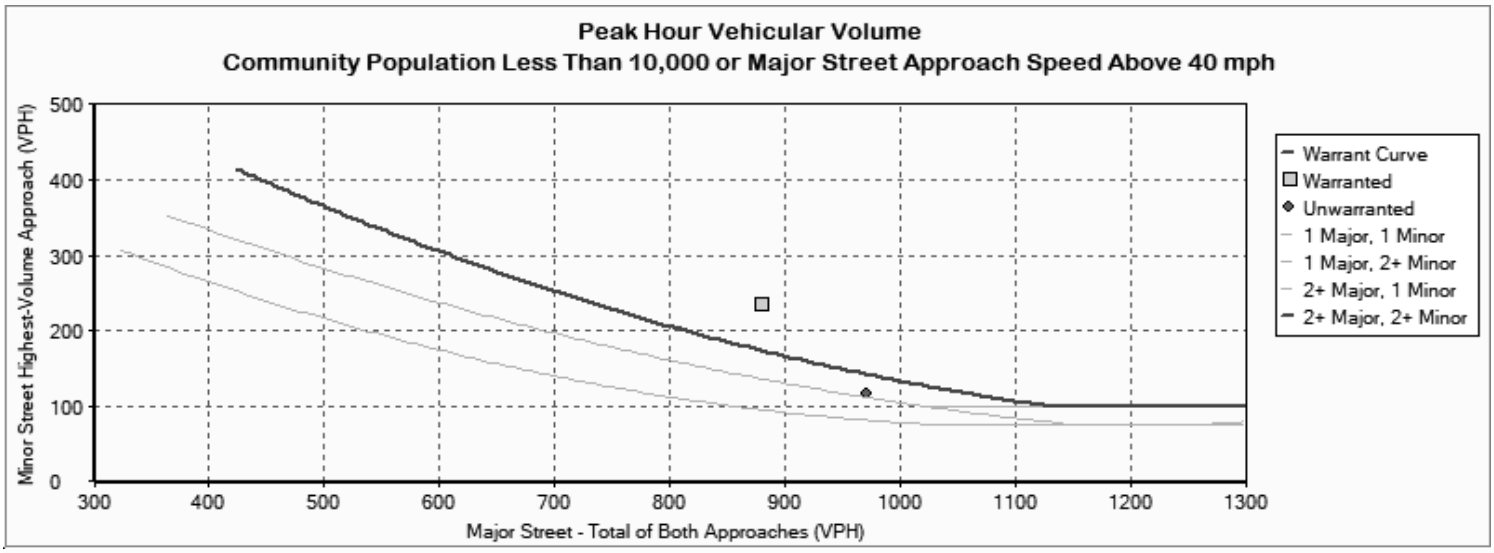
Details

Low Population? No

Condition A Met No — **Condition B Met** Yes

Notes 0 Hours met (1 required) — **Notes** 1 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

1: Grantland Ave & Bullard Ave - Existing

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:30	881	235
17:00	971	116

Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Existing Plus Project

Intersection Information

	Major Street	Minor Street
Street Name	Grantland Ave	Barstow Ave
Direction	NB/SB	EB/WB
Number of Lanes	2	1
Approch Speed	45	30

Warrant 3 Met? **No**

Details

Low Population? No

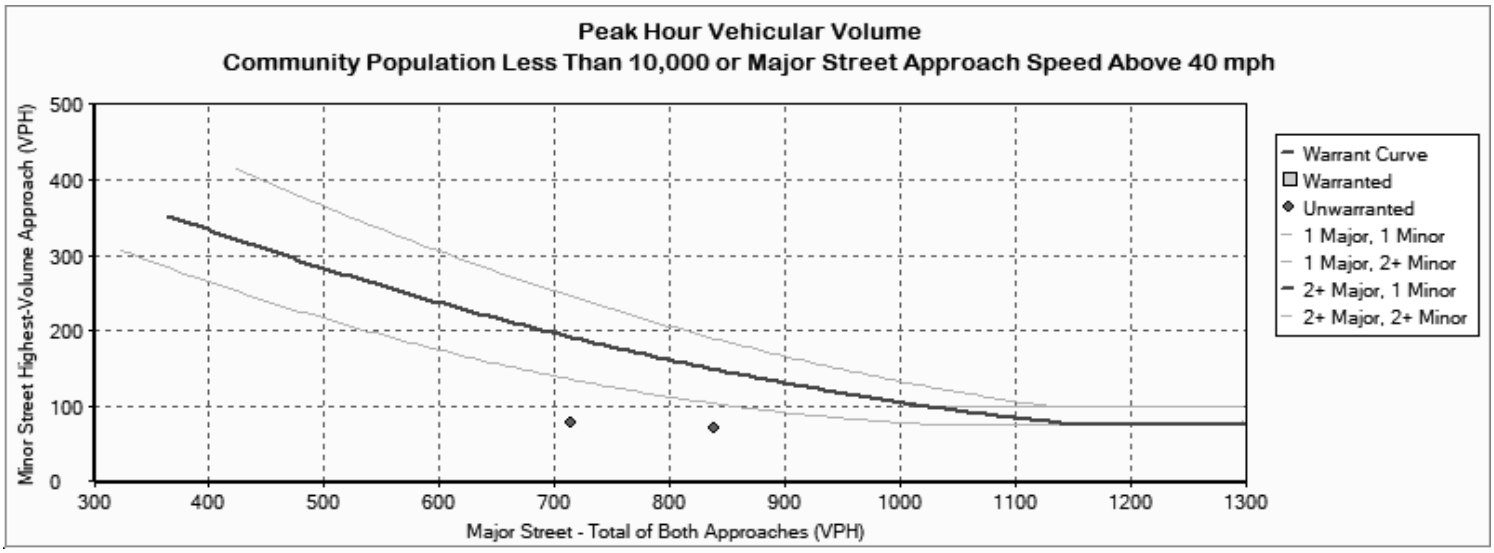
Condition A Met? No

Notes 0 Hours met (1 required)

Condition B Met? No

Notes 0 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Existing Plus Project

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:30	715	79
17:00	838	71

Warrant 3: Peak Hour

1: Grantland Ave & Bullard Ave - Existing Plus Project

Intersection Information

	Major Street	Minor Street
Street Name	Grantland Ave	Bullard Ave
Direction	NB/SB	EB/WB
Number of Lanes	2	2
Approch Speed	45	30

Warrant 3 Met? **Yes**

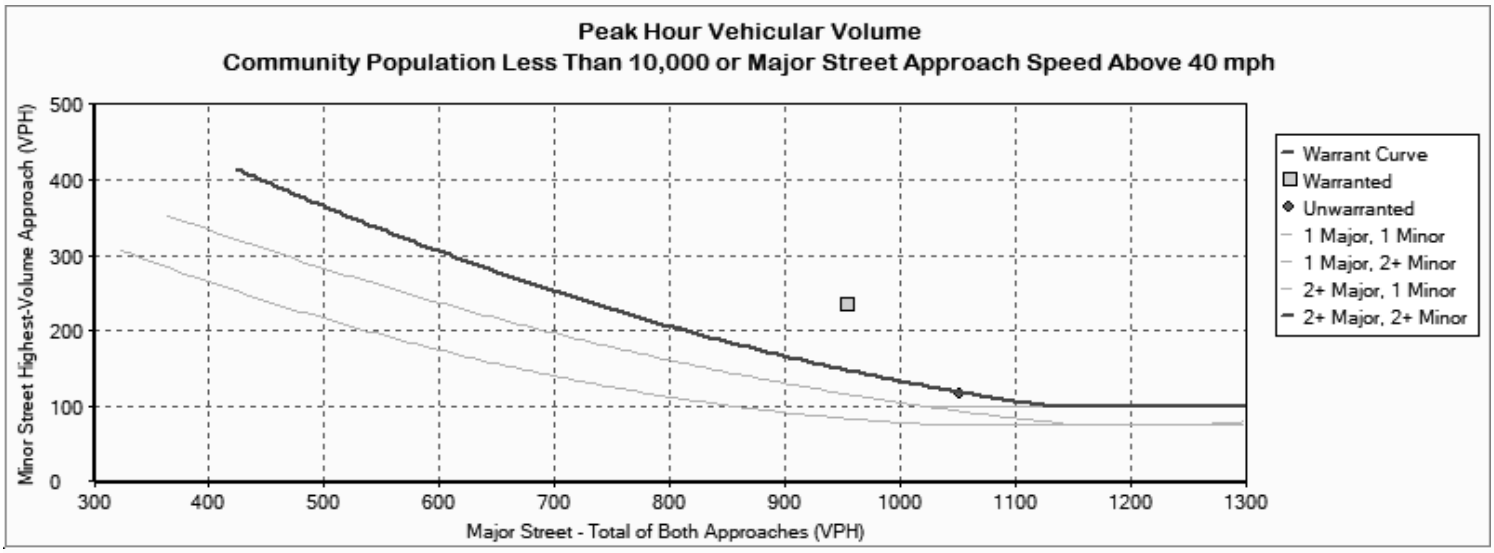
Details

Low Population? No

Condition A Met No — **Condition B Met** Yes

Notes 0 Hours met (1 required) — **Notes** 1 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

1: Grantland Ave & Bullard Ave - Existing Plus Project

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:30	955	235
17:00	1,052	116

Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Near-Term With Project

Intersection Information

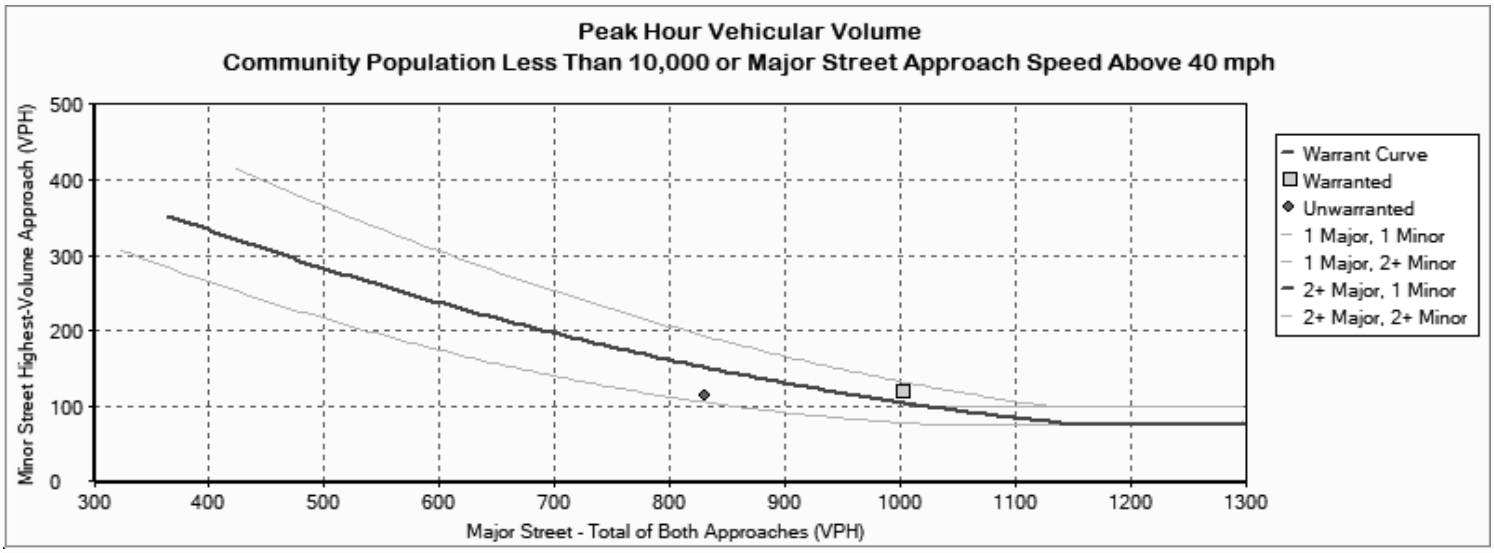
	Major Street	Minor Street
Street Name	Grantland Ave	Barstow Ave
Direction	NB/SB	EB/WB
Number of Lanes	2	1
Approch Speed	45	30

Warrant 3 Met? **Yes**

Details

Low Population?	No		
Condition A Met	No	**Condition B Met**	Yes
Notes	0 Hours met (1 required)	**Notes**	1 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Near-Term With Project

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:30	831	113
17:00	1,004	118

Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Cumulative 2040 No Project

Intersection Information

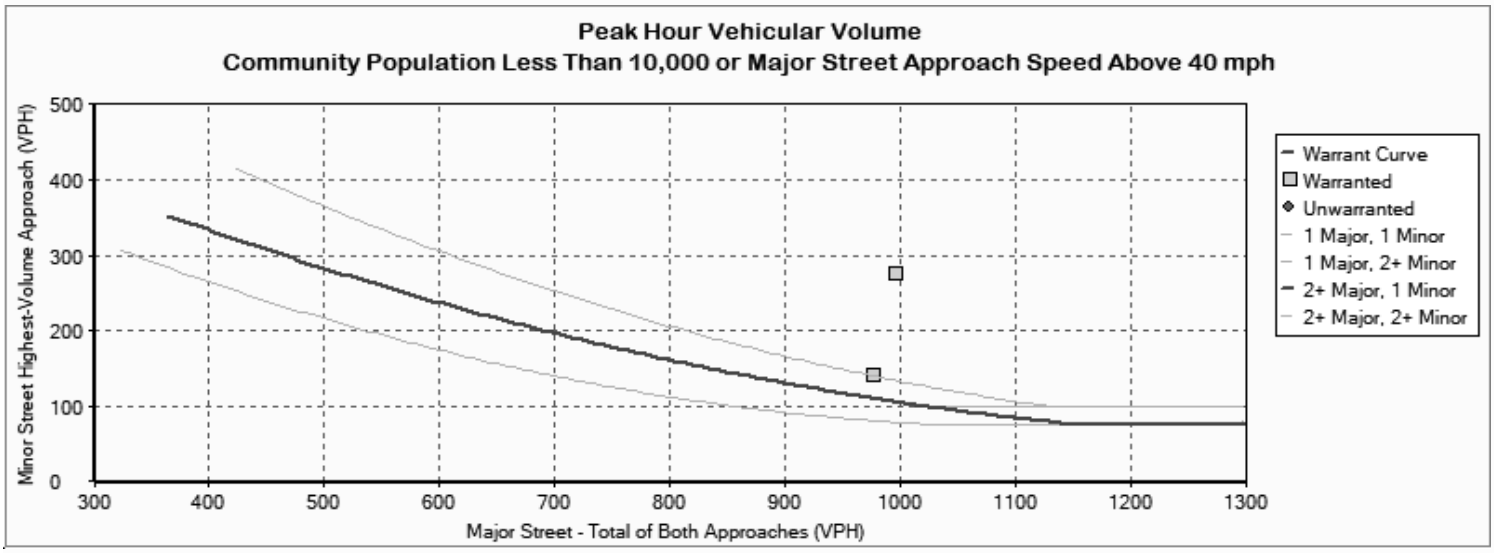
	Major Street	Minor Street
Street Name	Grantland Ave	Barstow Ave
Direction	NB/SB	EB/WB
Number of Lanes	2	1
Approch Speed	45	30

Warrant 3 Met? **Yes**

Details

Low Population?	No		
Condition A Met	No	**Condition B Met**	Yes
Notes	0 Hours met (1 required)	**Notes**	2 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Cumulative 2040 No Project

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:30	977	141
17:00	997	275

Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Cumulative 2040 With Project

Intersection Information

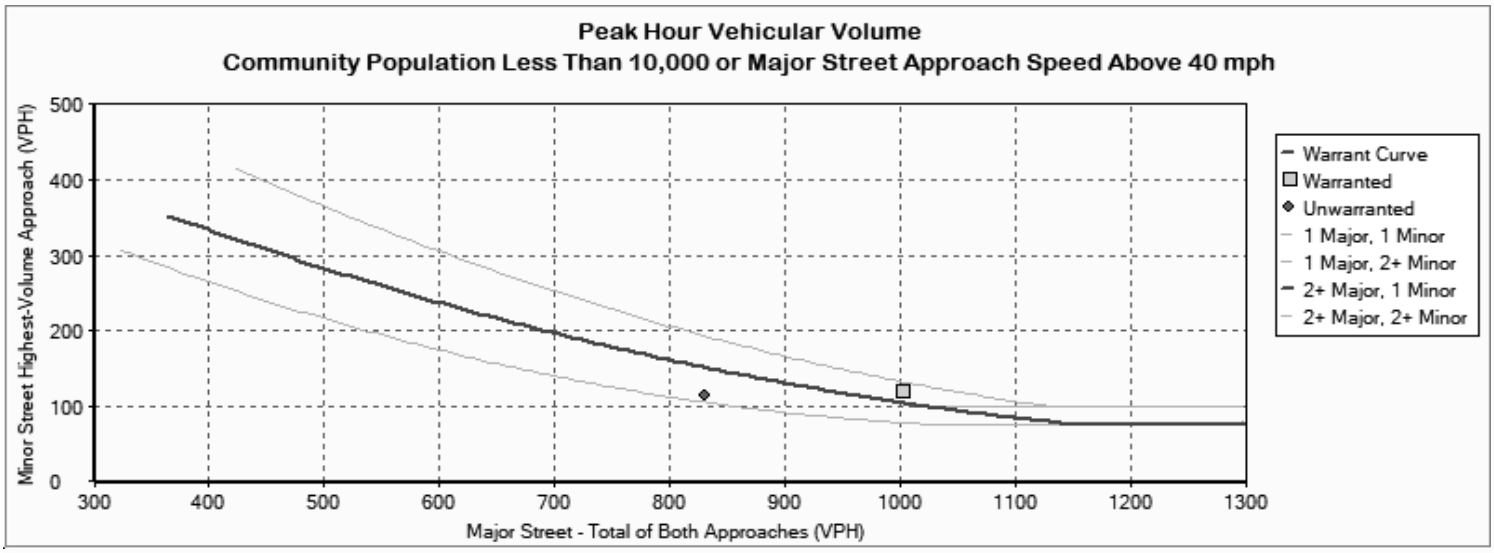
	Major Street	Minor Street
Street Name	Grantland Ave	Barstow Ave
Direction	NB/SB	EB/WB
Number of Lanes	2	1
Approch Speed	45	30

Warrant 3 Met? **Yes**

Details

Low Population?	No		
Condition A Met	No	**Condition B Met**	Yes
Notes	0 Hours met (1 required)	**Notes**	1 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

2: Grantland Ave & Barstow Ave - Cumulative 2040 With Project

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:30	831	113
17:00	1,004	118

APPENDIX G
MITIGATED INTERSECTION ANALYSIS SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	2	8	6	7	222	5	502	4	104	322	18
Future Volume (veh/h)	22	2	8	6	7	222	5	502	4	104	322	18
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		0.96	1.00		0.98	1.00		0.96	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	26	2	9	7	8	258	6	584	5	121	374	21
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	68	308	16	406	337	14	992	428	156	628	35
Arrive On Green	0.03	0.24	0.24	0.01	0.22	0.22	0.01	0.28	0.28	0.09	0.36	0.36
Sat Flow, veh/h	1757	284	1277	1757	1845	1531	1757	3505	1513	1757	1727	97
Grp Volume(v), veh/h	26	0	11	7	8	258	6	584	5	121	0	395
Grp Sat Flow(s),veh/h/ln	1757	0	1560	1757	1845	1531	1757	1752	1513	1757	0	1824
Q Serve(g_s), s	0.7	0.0	0.3	0.2	0.2	7.5	0.2	6.8	0.1	3.2	0.0	8.3
Cycle Q Clear(g_c), s	0.7	0.0	0.3	0.2	0.2	7.5	0.2	6.8	0.1	3.2	0.0	8.3
Prop In Lane	1.00		0.82	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	54	0	377	16	406	337	14	992	428	156	0	663
V/C Ratio(X)	0.48	0.00	0.03	0.43	0.02	0.77	0.43	0.59	0.01	0.78	0.00	0.60
Avail Cap(c_a), veh/h	220	0	596	220	704	585	220	1435	619	335	0	867
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	0.0	13.7	23.2	14.4	17.2	23.3	14.5	12.2	21.0	0.0	12.2
Incr Delay (d2), s/veh	6.6	0.0	0.0	16.8	0.0	3.6	19.1	0.6	0.0	8.0	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.1	0.2	0.1	3.5	0.2	3.3	0.0	1.9	0.0	4.3
LnGrp Delay(d),s/veh	29.1	0.0	13.7	40.0	14.4	20.9	42.4	15.1	12.2	29.0	0.0	13.0
LnGrp LOS	C		B	D	B	C	D	B	B	C		B
Approach Vol, veh/h		37			273			595			516	
Approach Delay, s/veh		24.5			21.2			15.4			16.8	
Approach LOS		C			C			B			B	

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	8.2	18.2	4.4	16.3	4.4	22.0	5.4	15.3
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	9.0	19.3	5.9	18.0	5.9	22.4	5.9	18.0
Max Q Clear Time (g_c+I1), s	5.2	8.8	2.2	2.3	2.2	10.3	2.7	9.5
Green Ext Time (p_c), s	0.1	4.3	0.0	0.9	0.0	4.6	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	26	11	7	8	258	6	584	5	121	395
v/c Ratio	0.11	0.04	0.03	0.03	0.55	0.03	0.47	0.01	0.38	0.40
Control Delay	23.5	13.3	23.0	19.1	8.6	23.0	14.8	0.0	23.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	13.3	23.0	19.1	8.6	23.0	14.8	0.0	23.3	10.1
Queue Length 50th (ft)	5	0	1	2	0	1	55	0	24	33
Queue Length 95th (ft)	29	12	13	12	47	12	138	0	87	197
Internal Link Dist (ft)		904		874			1832			2179
Turn Bay Length (ft)	250		1			270		200	250	
Base Capacity (vph)	246	678	246	791	805	246	1612	778	375	1056
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.02	0.03	0.01	0.32	0.02	0.36	0.01	0.32	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	2	5	10	5	101	9	400	8	121	497	17
Future Volume (veh/h)	15	2	5	10	5	101	9	400	8	121	497	17
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		0.95	1.00		0.97	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	16	2	5	11	5	110	10	435	9	132	540	18
Adj No. of Lanes	1	1	0	1	1	1	1	2	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	36	55	137	25	215	177	23	1190	515	173	753	25
Arrive On Green	0.02	0.12	0.12	0.01	0.12	0.12	0.01	0.34	0.34	0.10	0.42	0.42
Sat Flow, veh/h	1757	449	1122	1757	1845	1516	1757	3505	1517	1757	1773	59
Grp Volume(v), veh/h	16	0	7	11	5	110	10	435	9	132	0	558
Grp Sat Flow(s),veh/h/ln	1757	0	1570	1757	1845	1516	1757	1752	1517	1757	0	1832
Q Serve(g_s), s	0.4	0.0	0.2	0.3	0.1	2.9	0.2	3.9	0.2	3.1	0.0	10.5
Cycle Q Clear(g_c), s	0.4	0.0	0.2	0.3	0.1	2.9	0.2	3.9	0.2	3.1	0.0	10.5
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	36	0	192	25	215	177	23	1190	515	173	0	778
V/C Ratio(X)	0.45	0.00	0.04	0.44	0.02	0.62	0.43	0.37	0.02	0.76	0.00	0.72
Avail Cap(c_a), veh/h	252	0	679	252	798	655	252	1666	721	554	0	1186
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	16.2	20.5	16.4	17.6	20.5	10.4	9.2	18.4	0.0	10.0
Incr Delay (d2), s/veh	8.6	0.0	0.1	11.4	0.0	3.6	12.4	0.2	0.0	6.9	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	0.2	0.1	1.4	0.2	1.9	0.1	1.8	0.0	5.5
LnGrp Delay(d),s/veh	28.9	0.0	16.3	31.9	16.4	21.2	32.9	10.6	9.2	25.3	0.0	11.2
LnGrp LOS	C		B	C	B	C	C	B	A	C		B
Approach Vol, veh/h		23			126			454			690	
Approach Delay, s/veh		25.0			21.9			11.1			13.9	
Approach LOS		C			C			B			B	

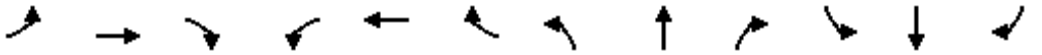
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	19.1	4.6	10.0	4.5	22.7	4.8	9.8
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	13.2	19.9	6.0	18.1	6.0	27.1	6.0	18.1
Max Q Clear Time (g_c+I1), s	5.1	5.9	2.3	2.2	2.2	12.5	2.4	4.9
Green Ext Time (p_c), s	0.2	5.1	0.0	0.3	0.0	5.2	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	7	11	5	110	10	435	9	132	558
v/c Ratio	0.06	0.03	0.04	0.02	0.28	0.04	0.29	0.01	0.35	0.47
Control Delay	21.3	16.7	21.3	21.2	2.1	21.2	13.2	0.0	19.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	16.7	21.3	21.2	2.1	21.2	13.2	0.0	19.2	9.3
Queue Length 50th (ft)	3	0	2	1	0	2	39	0	23	52
Queue Length 95th (ft)	22	11	17	11	5	16	104	0	88	275
Internal Link Dist (ft)		904		874			1832			2179
Turn Bay Length (ft)	250		1			270		200	250	
Base Capacity (vph)	272	754	272	865	825	272	2022	957	599	1288
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.04	0.01	0.13	0.04	0.22	0.01	0.22	0.43

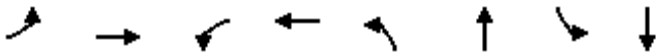
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	15	45	64	21	28	17	400	51	39	315	9
Future Volume (veh/h)	24	15	45	64	21	28	17	400	51	39	315	9
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		0.97	1.00		0.95	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	27	17	51	72	24	31	19	449	57	44	354	10
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	45	136	117	105	136	41	592	75	83	703	20
Arrive On Green	0.03	0.11	0.11	0.07	0.15	0.15	0.02	0.37	0.37	0.05	0.39	0.39
Sat Flow, veh/h	1757	396	1189	1757	710	917	1757	1598	203	1757	1783	50
Grp Volume(v), veh/h	27	0	68	72	0	55	19	0	506	44	0	364
Grp Sat Flow(s),veh/h/ln	1757	0	1585	1757	0	1627	1757	0	1801	1757	0	1834
Q Serve(g_s), s	0.7	0.0	1.8	1.8	0.0	1.3	0.5	0.0	10.9	1.1	0.0	6.6
Cycle Q Clear(g_c), s	0.7	0.0	1.8	1.8	0.0	1.3	0.5	0.0	10.9	1.1	0.0	6.6
Prop In Lane	1.00		0.75	1.00		0.56	1.00		0.11	1.00		0.03
Lane Grp Cap(c), veh/h	56	0	181	117	0	242	41	0	667	83	0	723
V/C Ratio(X)	0.48	0.00	0.38	0.62	0.00	0.23	0.46	0.00	0.76	0.53	0.00	0.50
Avail Cap(c_a), veh/h	238	0	648	238	0	665	238	0	899	238	0	915
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	21.1	0.0	18.2	20.1	0.0	16.6	21.3	0.0	12.2	20.6	0.0	10.1
Incr Delay (d2), s/veh	6.3	0.0	1.3	5.2	0.0	0.5	7.8	0.0	2.6	5.2	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	0.4	0.0	0.8	1.0	0.0	0.6	0.3	0.0	5.8	0.6	0.0	3.4
LnGrp Delay(d),s/veh	27.4	0.0	19.5	25.4	0.0	17.1	29.1	0.0	14.8	25.8	0.0	10.7
LnGrp LOS	C		B	C		B	C		B	C		B
Approach Vol, veh/h		95			127			525			408	
Approach Delay, s/veh		21.7			21.8			15.3			12.3	
Approach LOS		C			C			B			B	

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	6.1	21.3	6.9	9.9	5.0	22.4	5.4	11.5
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	6.0	22.1	6.0	18.1	6.0	22.1	6.0	18.1
Max Q Clear Time (g_c+I1), s	3.1	12.9	3.8	3.8	2.5	8.6	2.7	3.3
Green Ext Time (p_c), s	0.0	3.4	0.0	0.5	0.0	4.2	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	68	72	55	19	506	44	364
v/c Ratio	0.11	0.24	0.29	0.16	0.08	0.44	0.18	0.29
Control Delay	25.0	13.0	26.6	14.3	24.7	14.0	25.3	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	13.0	26.6	14.3	24.7	14.0	25.3	9.9
Queue Length 50th (ft)	7	4	19	4	5	95	11	62
Queue Length 95th (ft)	30	35	59	35	23	#293	41	172
Internal Link Dist (ft)		1810		2700		823		679
Turn Bay Length (ft)					300		270	
Base Capacity (vph)	254	733	254	741	254	1158	254	1236
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.09	0.28	0.07	0.07	0.44	0.17	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	896	44	258	606	120	47	58	531	283	39	31
Future Volume (veh/h)	37	896	44	258	606	120	47	58	531	283	39	31
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		0.96	1.00		0.95	1.00		0.95	1.00		0.94
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	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1900
Adj Flow Rate, veh/h	39	953	37	274	645	90	50	62	396	301	41	27
Adj No. of Lanes	1	2	1	2	2	1	1	1	1	1	1	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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	59	1112	479	360	1365	578	67	357	453	334	350	230
Arrive On Green	0.03	0.32	0.32	0.11	0.39	0.39	0.04	0.20	0.20	0.19	0.35	0.35
Sat Flow, veh/h	1740	3471	1495	3375	3471	1469	1740	1827	1471	1740	1002	660
Grp Volume(v), veh/h	39	953	37	274	645	90	50	62	396	301	0	68
Grp Sat Flow(s),veh/h/ln	1740	1736	1495	1688	1736	1469	1740	1827	1471	1740	0	1662
Q Serve(g_s), s	2.1	24.6	1.7	7.6	13.3	3.8	2.7	2.7	18.7	16.2	0.0	2.7
Cycle Q Clear(g_c), s	2.1	24.6	1.7	7.6	13.3	3.8	2.7	2.7	18.7	16.2	0.0	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	59	1112	479	360	1365	578	67	357	453	334	0	580
V/C Ratio(X)	0.67	0.86	0.08	0.76	0.47	0.16	0.75	0.17	0.87	0.90	0.00	0.12
Avail Cap(c_a), veh/h	123	1163	501	740	1677	710	160	357	453	370	0	580
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	0.00	1.00
Uniform Delay (d), s/veh	45.8	30.5	22.7	41.6	21.7	18.8	45.6	32.1	31.9	37.8	0.0	21.2
Incr Delay (d2), s/veh	12.2	6.3	0.1	3.3	0.3	0.1	15.3	0.2	17.1	22.8	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	1.2	12.8	0.7	3.7	6.4	1.5	1.6	1.4	12.0	9.9	0.0	1.2
LnGrp Delay(d),s/veh	57.9	36.9	22.8	44.9	21.9	18.9	60.9	32.4	49.0	60.6	0.0	21.3
LnGrp LOS	E	D	C	D	C	B	E	C	D	E		C
Approach Vol, veh/h		1029			1009			508			369	
Approach Delay, s/veh		37.2			27.9			48.2			53.4	
Approach LOS		D			C			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	22.4	23.6	14.2	35.6	7.7	38.3	7.2	42.6
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	20.4	18.7	21.0	32.1	8.8	30.3	6.8	46.3
Max Q Clear Time (g_c+I1), s	18.2	20.7	9.6	26.6	4.7	4.7	4.1	15.3
Green Ext Time (p_c), s	0.2	0.0	0.7	4.0	0.0	2.3	0.0	13.1

Intersection Summary	
HCM 2010 Ctrl Delay	37.9
HCM 2010 LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	953	47	274	645	128	50	62	565	301	74
v/c Ratio	0.34	0.87	0.08	0.38	0.37	0.16	0.37	0.39	1.04	0.86	0.18
Control Delay	53.9	42.4	0.3	35.9	16.9	3.1	52.5	50.1	78.8	62.5	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	42.4	0.3	35.9	16.9	3.1	52.5	50.1	78.8	62.5	21.4
Queue Length 50th (ft)	24	297	0	77	138	0	31	38	~329	186	21
Queue Length 95th (ft)	60	#427	0	121	194	28	70	79	#558	#346	60
Internal Link Dist (ft)		7910			1209			1301			428
Turn Bay Length (ft)	200			200		200	120			120	
Base Capacity (vph)	120	1132	598	718	1753	783	155	347	542	359	526
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.84	0.08	0.38	0.37	0.16	0.32	0.18	1.04	0.84	0.14

Intersection Summary

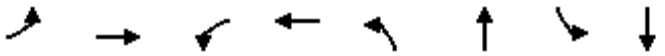
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	28	78	17	23	35	361	84	58	442	24
Future Volume (veh/h)	23	16	28	78	17	23	35	361	84	58	442	24
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		0.97	1.00		0.95	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	23	16	28	79	17	23	35	365	85	59	446	24
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	49	61	106	124	101	136	70	516	120	103	654	35
Arrive On Green	0.03	0.10	0.10	0.07	0.15	0.15	0.04	0.36	0.36	0.06	0.38	0.38
Sat Flow, veh/h	1757	589	1031	1757	690	933	1757	1438	335	1757	1731	93
Grp Volume(v), veh/h	23	0	44	79	0	40	35	0	450	59	0	470
Grp Sat Flow(s),veh/h/ln	1757	0	1620	1757	0	1623	1757	0	1773	1757	0	1825
Q Serve(g_s), s	0.6	0.0	1.1	1.9	0.0	0.9	0.8	0.0	9.5	1.4	0.0	9.4
Cycle Q Clear(g_c), s	0.6	0.0	1.1	1.9	0.0	0.9	0.8	0.0	9.5	1.4	0.0	9.4
Prop In Lane	1.00		0.64	1.00		0.57	1.00		0.19	1.00		0.05
Lane Grp Cap(c), veh/h	49	0	167	124	0	237	70	0	636	103	0	689
V/C Ratio(X)	0.47	0.00	0.26	0.64	0.00	0.17	0.50	0.00	0.71	0.57	0.00	0.68
Avail Cap(c_a), veh/h	242	0	674	242	0	675	242	0	900	242	0	927
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	18.0	19.7	0.0	16.3	20.5	0.0	12.0	20.0	0.0	11.4
Incr Delay (d2), s/veh	6.8	0.0	0.8	5.3	0.0	0.3	5.5	0.0	1.5	4.9	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.5	1.1	0.0	0.4	0.5	0.0	4.9	0.8	0.0	4.9
LnGrp Delay(d),s/veh	27.7	0.0	18.8	25.0	0.0	16.6	26.0	0.0	13.5	24.9	0.0	12.6
LnGrp LOS	C		B	C		B	C		B	C		B
Approach Vol, veh/h		67			119			485			529	
Approach Delay, s/veh		21.9			22.2			14.4			14.0	
Approach LOS		C			C			B			B	

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	6.5	20.5	7.1	9.4	5.7	21.3	5.2	11.3
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	6.0	22.1	6.0	18.1	6.0	22.1	6.0	18.1
Max Q Clear Time (g_c+I1), s	3.4	11.5	3.9	3.1	2.8	11.4	2.6	2.9
Green Ext Time (p_c), s	0.0	4.0	0.0	0.3	0.0	4.0	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	44	79	40	35	450	59	470
v/c Ratio	0.09	0.16	0.29	0.12	0.14	0.40	0.23	0.38
Control Delay	24.0	14.7	25.3	13.6	24.1	12.6	24.7	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	14.7	25.3	13.6	24.1	12.6	24.7	11.6
Queue Length 50th (ft)	5	3	16	4	7	78	12	42
Queue Length 95th (ft)	27	29	64	29	35	219	51	235
Internal Link Dist (ft)		1810		2700		823		679
Turn Bay Length (ft)					300		270	
Base Capacity (vph)	268	776	275	775	268	1174	268	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.06	0.29	0.05	0.13	0.38	0.22	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	750	77	509	930	351	34	56	382	231	76	45
Future Volume (veh/h)	34	750	77	509	930	351	34	56	382	231	76	45
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		0.96	1.00		0.95	1.00		0.95	1.00		0.96
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	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1900
Adj Flow Rate, veh/h	36	789	65	536	979	258	36	59	322	243	80	36
Adj No. of Lanes	1	2	1	2	2	1	1	1	1	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	55	1017	437	614	1538	654	55	347	562	276	374	168
Arrive On Green	0.03	0.29	0.29	0.18	0.44	0.44	0.03	0.19	0.19	0.16	0.32	0.32
Sat Flow, veh/h	1740	3471	1492	3375	3471	1475	1740	1827	1469	1740	1179	530
Grp Volume(v), veh/h	36	789	65	536	979	258	36	59	322	243	0	116
Grp Sat Flow(s),veh/h/ln	1740	1736	1492	1688	1736	1475	1740	1827	1469	1740	0	1709
Q Serve(g_s), s	2.1	21.0	3.3	15.6	22.1	11.9	2.1	2.7	17.8	13.8	0.0	5.0
Cycle Q Clear(g_c), s	2.1	21.0	3.3	15.6	22.1	11.9	2.1	2.7	17.8	13.8	0.0	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	55	1017	437	614	1538	654	55	347	562	276	0	543
V/C Ratio(X)	0.66	0.78	0.15	0.87	0.64	0.39	0.66	0.17	0.57	0.88	0.00	0.21
Avail Cap(c_a), veh/h	114	1086	467	715	1595	678	114	347	562	345	0	552
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	0.00	1.00
Uniform Delay (d), s/veh	48.4	32.7	26.4	40.2	21.8	19.0	48.4	34.2	25.5	41.5	0.0	25.2
Incr Delay (d2), s/veh	12.6	3.4	0.2	10.4	0.8	0.4	12.6	0.2	1.4	18.9	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	1.2	10.6	1.4	8.2	10.8	4.9	1.2	1.4	7.4	8.1	0.0	2.4
LnGrp Delay(d),s/veh	61.0	36.1	26.6	50.6	22.6	19.4	61.0	34.4	26.9	60.4	0.0	25.4
LnGrp LOS	E	D	C	D	C	B	E	C	C	E		C
Approach Vol, veh/h		890			1773			417			359	
Approach Delay, s/veh		36.4			30.6			30.9			49.1	
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	20.0	24.1	22.4	34.5	7.2	37.0	7.2	49.7
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	20.0	19.2	21.4	31.6	6.6	32.6	6.6	46.4
Max Q Clear Time (g_c+I1), s	15.8	19.8	17.6	23.0	4.1	7.0	4.1	24.1
Green Ext Time (p_c), s	0.3	0.0	0.8	6.6	0.0	2.3	0.0	13.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	789	81	536	979	369	36	59	402	243	127
v/c Ratio	0.29	0.77	0.15	0.74	0.57	0.42	0.29	0.34	0.73	0.73	0.27
Control Delay	50.5	35.5	0.5	41.4	19.4	3.5	50.5	47.0	28.6	49.7	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	35.5	0.5	41.4	19.4	3.5	50.5	47.0	28.6	49.7	25.5
Queue Length 50th (ft)	21	228	0	155	232	1	21	34	150	137	50
Queue Length 95th (ft)	56	313	0	231	317	52	56	76	267	#255	104
Internal Link Dist (ft)		1421			1209			1301			428
Turn Bay Length (ft)	200			200		200	120			120	
Base Capacity (vph)	131	1257	644	826	1846	924	131	402	599	398	648
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.63	0.13	0.65	0.53	0.40	0.27	0.15	0.67	0.61	0.20

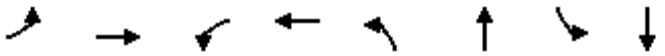
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	65	44	73	25	28	17	414	88	38	286	9
Future Volume (veh/h)	21	65	44	73	25	28	17	414	88	38	286	9
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		0.97	1.00		0.95	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	23	71	48	79	27	30	18	450	96	41	311	10
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	48	132	89	118	133	148	39	575	123	77	736	24
Arrive On Green	0.03	0.13	0.13	0.07	0.17	0.17	0.02	0.39	0.39	0.04	0.41	0.41
Sat Flow, veh/h	1757	1013	685	1757	779	865	1757	1465	313	1757	1775	57
Grp Volume(v), veh/h	23	0	119	79	0	57	18	0	546	41	0	321
Grp Sat Flow(s),veh/h/ln	1757	0	1698	1757	0	1644	1757	0	1778	1757	0	1832
Q Serve(g_s), s	0.6	0.0	3.2	2.1	0.0	1.5	0.5	0.0	13.1	1.1	0.0	6.1
Cycle Q Clear(g_c), s	0.6	0.0	3.2	2.1	0.0	1.5	0.5	0.0	13.1	1.1	0.0	6.1
Prop In Lane	1.00		0.40	1.00		0.53	1.00		0.18	1.00		0.03
Lane Grp Cap(c), veh/h	48	0	222	118	0	280	39	0	698	77	0	759
V/C Ratio(X)	0.48	0.00	0.54	0.67	0.00	0.20	0.46	0.00	0.78	0.53	0.00	0.42
Avail Cap(c_a), veh/h	216	0	631	216	0	611	216	0	989	216	0	1020
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	23.3	0.0	19.8	22.2	0.0	17.4	23.5	0.0	13.0	22.8	0.0	10.1
Incr Delay (d2), s/veh	7.1	0.0	2.0	6.3	0.0	0.4	8.3	0.0	2.7	5.6	0.0	0.4
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	0.4	0.0	1.6	1.2	0.0	0.7	0.3	0.0	6.9	0.7	0.0	3.1
LnGrp Delay(d),s/veh	30.5	0.0	21.8	28.5	0.0	17.7	31.8	0.0	15.6	28.4	0.0	10.5
LnGrp LOS	C		C	C		B	C		B	C		B
Approach Vol, veh/h		142			136			564			362	
Approach Delay, s/veh		23.2			24.0			16.1			12.5	
Approach LOS		C			C			B			B	

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	6.1	24.0	7.3	11.3	5.1	25.1	5.3	13.2
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	6.0	27.1	6.0	18.1	6.0	27.1	6.0	18.1
Max Q Clear Time (g_c+I1), s	3.1	15.1	4.1	5.2	2.5	8.1	2.6	3.5
Green Ext Time (p_c), s	0.0	4.0	0.0	0.7	0.0	5.0	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	119	79	57	18	546	41	321
v/c Ratio	0.10	0.36	0.34	0.13	0.08	0.55	0.18	0.30
Control Delay	28.8	19.6	31.8	13.3	28.5	16.1	29.1	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	19.6	31.8	13.3	28.5	16.1	29.1	10.9
Queue Length 50th (ft)	7	21	23	5	5	117	12	59
Queue Length 95th (ft)	30	71	#82	38	25	#346	44	163
Internal Link Dist (ft)		1810		2700		823		679
Turn Bay Length (ft)					300		270	
Base Capacity (vph)	237	728	237	710	237	1102	237	1180
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.16	0.33	0.08	0.08	0.50	0.17	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	885	72	290	635	102	52	52	536	259	43	11
Future Volume (veh/h)	35	885	72	290	635	102	52	52	536	259	43	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		0.96	1.00		0.95	1.00		0.95	1.00		0.94
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	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1900
Adj Flow Rate, veh/h	38	962	63	315	690	77	57	57	408	282	47	10
Adj No. of Lanes	1	2	1	2	2	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	57	1132	488	402	1431	607	73	348	465	314	475	101
Arrive On Green	0.03	0.33	0.33	0.12	0.41	0.41	0.04	0.19	0.19	0.18	0.33	0.33
Sat Flow, veh/h	1740	3471	1496	3375	3471	1471	1740	1827	1469	1740	1443	307
Grp Volume(v), veh/h	38	962	63	315	690	77	57	57	408	282	0	57
Grp Sat Flow(s),veh/h/ln	1740	1736	1496	1688	1736	1471	1740	1827	1469	1740	0	1749
Q Serve(g_s), s	2.1	25.1	2.9	8.8	14.1	3.1	3.1	2.5	18.5	15.4	0.0	2.2
Cycle Q Clear(g_c), s	2.1	25.1	2.9	8.8	14.1	3.1	3.1	2.5	18.5	15.4	0.0	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	57	1132	488	402	1431	607	73	348	465	314	0	576
V/C Ratio(X)	0.66	0.85	0.13	0.78	0.48	0.13	0.78	0.16	0.88	0.90	0.00	0.10
Avail Cap(c_a), veh/h	120	1188	512	748	1717	728	165	348	465	341	0	576
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	0.00	1.00
Uniform Delay (d), s/veh	46.4	30.5	23.0	41.5	20.9	17.7	46.0	32.8	31.9	38.9	0.0	22.6
Incr Delay (d2), s/veh	12.2	5.8	0.1	3.4	0.3	0.1	16.4	0.2	17.0	24.1	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	1.2	12.9	1.2	4.3	6.9	1.3	1.9	1.3	12.5	9.5	0.0	1.1
LnGrp Delay(d),s/veh	58.6	36.3	23.1	44.9	21.2	17.8	62.5	33.0	49.0	62.9	0.0	22.6
LnGrp LOS	E	D	C	D	C	B	E	C	D	E		C
Approach Vol, veh/h		1063			1082			522			339	
Approach Delay, s/veh		36.3			27.8			48.7			56.2	
Approach LOS		D			C			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	21.5	23.4	15.6	36.5	8.1	36.9	7.2	44.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	19.0	18.5	21.5	33.2	9.2	28.3	6.7	48.0
Max Q Clear Time (g_c+I1), s	17.4	20.5	10.8	27.1	5.1	4.2	4.1	16.1
Green Ext Time (p_c), s	0.2	0.0	0.8	4.6	0.0	2.3	0.0	13.9

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	962	78	315	690	111	57	57	583	282	59
v/c Ratio	0.34	0.86	0.13	0.43	0.38	0.14	0.41	0.36	1.06	0.85	0.15
Control Delay	53.8	40.7	0.5	35.9	16.2	2.0	53.0	49.6	85.0	63.9	29.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	40.7	0.5	35.9	16.2	2.0	53.0	49.6	85.0	63.9	29.8
Queue Length 50th (ft)	24	295	0	90	144	0	35	35	~360	175	26
Queue Length 95th (ft)	58	#405	0	136	202	19	77	74	#583	#332	62
Internal Link Dist (ft)		7910			1209			1301			428
Turn Bay Length (ft)	200			200		200	120			120	
Base Capacity (vph)	118	1177	615	739	1801	801	163	345	548	336	510
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.82	0.13	0.43	0.38	0.14	0.35	0.17	1.06	0.84	0.12

Intersection Summary

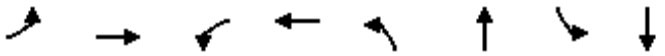
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	32	24	122	76	23	34	304	104	58	380	24
Future Volume (veh/h)	21	32	24	122	76	23	34	304	104	58	380	24
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		0.97	1.00		0.96	1.00		0.97	1.00		0.97
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	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	21	32	24	123	77	23	34	307	105	59	384	24
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	45	115	86	158	247	74	68	429	147	102	599	37
Arrive On Green	0.03	0.12	0.12	0.09	0.18	0.18	0.04	0.33	0.33	0.06	0.35	0.35
Sat Flow, veh/h	1757	964	723	1757	1349	403	1757	1303	446	1757	1714	107
Grp Volume(v), veh/h	21	0	56	123	0	100	34	0	412	59	0	408
Grp Sat Flow(s),veh/h/ln	1757	0	1688	1757	0	1752	1757	0	1748	1757	0	1822
Q Serve(g_s), s	0.5	0.0	1.3	3.0	0.0	2.2	0.8	0.0	9.1	1.4	0.0	8.3
Cycle Q Clear(g_c), s	0.5	0.0	1.3	3.0	0.0	2.2	0.8	0.0	9.1	1.4	0.0	8.3
Prop In Lane	1.00		0.43	1.00		0.23	1.00		0.25	1.00		0.06
Lane Grp Cap(c), veh/h	45	0	201	158	0	321	68	0	576	102	0	636
V/C Ratio(X)	0.46	0.00	0.28	0.78	0.00	0.31	0.50	0.00	0.72	0.58	0.00	0.64
Avail Cap(c_a), veh/h	235	0	688	318	0	798	239	0	800	239	0	834
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	21.2	0.0	17.7	19.7	0.0	15.6	20.8	0.0	13.0	20.2	0.0	12.0
Incr Delay (d2), s/veh	7.3	0.0	0.7	8.0	0.0	0.5	5.6	0.0	1.9	5.0	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	0.3	0.0	0.7	1.8	0.0	1.1	0.5	0.0	4.6	0.8	0.0	4.3
LnGrp Delay(d),s/veh	28.5	0.0	18.5	27.7	0.0	16.2	26.4	0.0	14.8	25.3	0.0	13.1
LnGrp LOS	C		B	C		B	C		B	C		B
Approach Vol, veh/h		77			223			446			467	
Approach Delay, s/veh		21.2			22.5			15.7			14.7	
Approach LOS		C			C			B			B	

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	6.6	19.4	8.0	10.2	5.7	20.3	5.1	13.0
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	6.0	20.2	8.0	18.0	6.0	20.2	5.9	20.1
Max Q Clear Time (g_c+I1), s	3.4	11.1	5.0	3.3	2.8	10.3	2.5	4.2
Green Ext Time (p_c), s	0.0	3.2	0.1	0.7	0.0	3.4	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	56	123	100	34	412	59	408
v/c Ratio	0.09	0.20	0.40	0.22	0.14	0.47	0.24	0.43
Control Delay	25.7	17.6	27.0	15.4	25.9	16.3	26.7	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	17.6	27.0	15.4	25.9	16.3	26.7	14.6
Queue Length 50th (ft)	7	10	39	18	11	112	19	80
Queue Length 95th (ft)	25	38	#93	62	35	#213	52	212
Internal Link Dist (ft)		1810		2700		823		679
Turn Bay Length (ft)					300		270	
Base Capacity (vph)	252	766	342	878	257	971	257	1049
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.36	0.11	0.13	0.42	0.23	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	778	83	476	1001	311	55	67	424	199	105	25
Future Volume (veh/h)	38	778	83	476	1001	311	55	67	424	199	105	25
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		0.96	1.00		0.95	1.00		0.95	1.00		0.93
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	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1827	1900
Adj Flow Rate, veh/h	40	819	69	501	1054	229	58	71	312	209	111	21
Adj No. of Lanes	1	2	1	2	2	1	1	1	1	1	1	0
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	59	1083	466	584	1566	666	74	355	554	243	430	81
Arrive On Green	0.03	0.31	0.31	0.17	0.45	0.45	0.04	0.19	0.19	0.14	0.29	0.29
Sat Flow, veh/h	1740	3471	1494	3375	3471	1476	1740	1827	1470	1740	1475	279
Grp Volume(v), veh/h	40	819	69	501	1054	229	58	71	312	209	0	132
Grp Sat Flow(s),veh/h/ln	1740	1736	1494	1688	1736	1476	1740	1827	1470	1740	0	1754
Q Serve(g_s), s	2.2	20.9	3.3	14.2	23.5	9.9	3.2	3.2	16.8	11.6	0.0	5.7
Cycle Q Clear(g_c), s	2.2	20.9	3.3	14.2	23.5	9.9	3.2	3.2	16.8	11.6	0.0	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	59	1083	466	584	1566	666	74	355	554	243	0	511
V/C Ratio(X)	0.68	0.76	0.15	0.86	0.67	0.34	0.78	0.20	0.56	0.86	0.00	0.26
Avail Cap(c_a), veh/h	120	1168	503	721	1669	709	164	373	569	318	0	514
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	0.00	1.00
Uniform Delay (d), s/veh	47.0	30.5	24.4	39.5	21.3	17.5	46.6	33.2	25.0	41.4	0.0	26.7
Incr Delay (d2), s/veh	12.9	2.7	0.1	8.6	1.0	0.3	16.1	0.3	1.2	16.6	0.0	0.3
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	1.3	10.4	1.4	7.3	11.5	4.1	1.9	1.6	7.0	6.7	0.0	2.8
LnGrp Delay(d),s/veh	59.9	33.1	24.6	48.1	22.3	17.8	62.7	33.5	26.2	58.0	0.0	27.0
LnGrp LOS	E	C	C	D	C	B	E	C	C	E		C
Approach Vol, veh/h		928			1784			441			341	
Approach Delay, s/veh		33.7			28.9			32.2			46.0	
Approach LOS		C			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	17.7	24.0	21.0	35.6	8.2	33.6	7.3	49.3
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	18.0	20.1	21.0	33.1	9.3	28.8	6.8	47.3
Max Q Clear Time (g_c+I1), s	13.6	18.8	16.2	22.9	5.2	7.7	4.2	25.5
Green Ext Time (p_c), s	0.2	0.4	0.8	7.8	0.0	2.3	0.0	13.8

Intersection Summary	
HCM 2010 Ctrl Delay	32.3
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	819	87	501	1054	327	58	71	446	209	137
v/c Ratio	0.31	0.77	0.15	0.71	0.61	0.38	0.37	0.38	0.80	0.69	0.36
Control Delay	50.5	33.9	0.6	40.5	19.5	4.0	49.3	46.7	33.5	49.7	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	33.9	0.6	40.5	19.5	4.0	49.3	46.7	33.5	49.7	34.1
Queue Length 50th (ft)	23	230	0	140	248	7	33	40	173	116	66
Queue Length 95th (ft)	61	320	0	217	344	57	78	87	#321	#223	129
Internal Link Dist (ft)		7910			1209			1301			428
Turn Bay Length (ft)	200			200		200	120			120	
Base Capacity (vph)	137	1338	675	823	1912	916	187	427	608	363	591
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.61	0.13	0.61	0.55	0.36	0.31	0.17	0.73	0.58	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

November 14, 2019 Project No. 014-19193

Mr. Bill Walls
Lennar Central Valley
8080 North Palm, Suite 110
Fresno, California 93711
bill.walls@lennar.com

RE: Phase I Environmental Site Assessment
Proposed Residential Development Property
5326 N. Grantland Avenue (APN 505-060-07)
Fresno, California 93723

Dear Mr. Walls:

Krazan & Associates, Inc., (Krazan) completed a Phase I Environmental Site Assessment at the referenced site summarized in a report dated November 14, 2019. We appreciate the opportunity to serve your environmental due diligence needs. During the course of this assessment, Krazan identified no evidence of recognized environmental conditions (RECs), controlled RECs (CRECs) or historical RECs (HRECs) in conjunction with the subject site as defined by ASTM E 1527-13. However, the following potential areas of concern (PAOCs) and site development issues are presented:

PAOCs

- During Krazan's November 1, 2019 site reconnaissance, a soil pile was observed along the eastern property boundary. There was no evidence of ground disturbance from construction or grading operations near the soil pile, and the soil pile is at the intersection of the Herndon and Epstein Canals. No evidence of soil staining, odors or stressed vegetation was observed within or adjacent to the soil pile. Krazan's experience indicates that imported soil can be contaminated with agricultural chemicals or other hazardous materials, dependent upon the specific location from which the soil is derived, and that the risk of contamination is increased for illegally disposed soils. Given the absence of specific information concerning the source or composition of the on-site soil pile, the presence or absence of potential significant concentrations of hazardous materials in the on-site soil pile is unknown.

  For a higher level of due diligence, Phase II limited soil sampling and analysis is recommended to ascertain the presence or absence of significant concentrations of constituents of concern in the on-site soil pile of unknown origin or content.

- Krazan's review of historical aerial photographs indicates that residential and farm-type structures were located in the central western portion of the subject site from at least 1937 until at least 1998 and that the subject site and immediately proximate properties were being utilized for agricultural purposes during this time interval. Historical uses of the subject site prior to 1937 were not reasonably ascertainable utilizing the standard historical references consulted during this

assessment, and it is therefore unknown how long the subject site was developed with structures prior to 1937. Underground storage tanks (USTs) on rural or agricultural properties historically have been exempt from requirements for registration with regulatory agencies. Krazan's experience with such properties has shown that it is not uncommon for property owners/operators to install USTs for their convenience, especially in the vicinity of structures, which are undocumented and whose presence would remain unknown in spite of the standard data research conducted in the course of this Phase I ESA and despite the subsequent cultivation of crops in the former farm area. It is therefore possible that subsurface features such as unregistered USTs may exist in the vicinity of the former on-site structures which remain unknown based upon the absence of any regulatory, municipality, interview data, or other evidence indicating their presence or location. Consequently, despite an absence of data suggesting their presence, the presence or absence of USTs associated with the subject site in a historical agricultural setting is unknown.

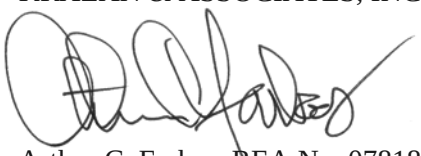
For a higher level of due diligence, a Limited Subsurface Assessment is recommended in the inferred areas historically occupied by farm structures to ascertain the presence or absence of evidence of current or former USTs or other subsurface features of concern in conjunction with the historical uses of the subject site.

SITE DEVELOPMENT ISSUES

- Based on Krazan's site reconnaissance of the subject site, a former irrigation system was observed throughout the subject site trending from east to west which consisted of numerous valves and concrete boxes. An inactive water well was located on the east side of the property near the intersection of the Herndon Canal and Epstein Canal. The pump for the well had apparently been removed. Two (2) electrical poles were also part of the irrigation system. If the on-site water well and irrigation system are not involved in redevelopment of the subject site, they should be properly abandoned/destroyed in accordance with state and local guidelines.

If you have any questions regarding the information presented in this report, please call me at (559) 348-2200.

Respectfully Submitted,
KRAZAN & ASSOCIATES, INC.



Arthur C. Farkas, REA No. 07818
Environmental Professional

ACF/mlt

PHASE I ENVIRONMENTAL
SITE ASSESSMENT
PROPOSED RESIDENTIAL DEVELOPMENT.
5326 N. GRANTLAND AVENUE
FRESNO, CALIFORNIA 93723

Pursuant to ASTM E 1527-13

Project No. 014-19136
November 14, 2019

Prepared for:
Mr. Bill Walls
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Prepared by:
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Krazan & ASSOCIATES, INC.
SITE DEVELOPMENT ENGINEERS

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November 14, 2019 Project No. 014-19193

PHASE I ENVIRONMENTAL SITE ASSESSMENT
PROPOSED RESIDENTIAL DEVELOPMENT.
5326 N. GRANTLAND AVENUE
FRESNO, CALIFORNIA 93723

1.0 EXECUTIVE SUMMARY

Krazan & Associates, Inc. (Krazan) has conducted a Phase I Environmental Site Assessment (ESA) of the proposed preschool property located at 5326 N. Grantland Avenue in Fresno, California 93723 (subject site). It is incumbent upon the user to read this Phase I ESA report in its entirety. If not otherwise defined within the text of this report, please refer to the Glossary of Terms Section following the References Section for definitions of terms and acronyms utilized within this Phase I ESA report. Krazan conducted the Phase I ESA of the subject site in conformance with the American Society for Testing and Materials (ASTM) E 1527-13 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.* This Phase I ESA constitutes all appropriate inquiry (AAI) designed to identify recognized environmental conditions (RECs) in connection with the previous ownership and uses of the subject site as defined by ASTM E 1527-13.

ASTM E 1527-13 Section 1.1.1 *Recognized Environmental Conditions* – In defining a standard of good commercial and customary practice for conducting an environmental site assessment of a parcel of property, the goal of the processes established by this practice is to identify recognized environmental conditions. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions.

During the course of this assessment, Krazan identified no evidence of recognized environmental conditions (RECs), controlled RECs (CRECs) or historical RECs (HRECs) in conjunction with the subject site as defined by ASTM E 1527-13. However, potential areas of concern (PAOCs) related to the presence of a soil pile of unknown contents along the eastern portion of the subject site and the presence of historical residential and farm structures on the subject site representing the potential for subsurface features of concern were revealed in addition to site development issues related to an on-site water well and irrigation system. Please see Section 8.0 Conclusions/Opinions for a discussion of these issues.

2.0 PURPOSE AND SCOPE OF ASSESSMENT

2.1 Purpose

According to ASTM E 1527-13, the purpose of this practice is to define good commercial and customary practice in the United States of America for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. §9601) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitation on CERCLA liability (hereinafter, the "landowner liability protections," or "LLPs"): that is, the practice that constitutes "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined at 42 U.S.C. §9601(35)(B).

2.2 Scope of Work

The Phase I ESA includes the following scope of work: a) a site reconnaissance of existing on-site conditions and observations of adjacent property uses, b) a review of user-provided documents, c) a review of historical aerial photographs, a review of pertinent building permit records, city directories, Sanborn fire insurance maps (SFIMs), and interview(s) with person(s) knowledgeable of the previous and current ownership and uses of the subject site, d) a review of applicable regulatory agency records and, e) a review of local, State, and Federal regulatory agency lists compiled by Environmental Data Resources, Inc. (EDR). The scope of work for this Phase I ESA conforms to ASTM E 1527-13. Krazan was provided written authorization to conduct the Phase I ESA by Ms. Wendy Erickson with Lennar Central Valley on October 30, 2019 approving Krazan's October 29, 2019 Proposal/Cost Estimate No. P19-328.

3.0 SITE DESCRIPTION

The subject site is located east on N. Grantland Avenue, south of W. Barstow Avenue in Fresno, California. The subject site consists of one (1) parcel measuring 29.84 acres with the associated Fresno County Assessor's Parcel Number (APN) of 505-030-07. The subject site is vacant land. General property information and property use are summarized in the following Table I. Refer to Figures No. 1 – 4 following the Reference Section.

TABLE I
Subject Site Information Summary

Current Owner:	Northwest Fresnans Investment Group
Assessor's Parcel Number:	505-060-07
Address:	N/A
Historical Address:	5326 N. Grantland Avenue
General Location:	N. Grantland Avenue, south of W. Barstow Avenue
Acreage:	29.84 acres
Existing Use:	Vacant Land
Number of Buildings:	None
Original Construction Date:	N/A
Proposed Use:	Residential Development
Topographic Map:	U.S. Geological Survey, 7.5 minute Herndon, California topographic quadrangle map, dated 1964, photo-inspected1978
Topographic Map Location:	NW quarter of Section 9, Township 13 South, Range 19 East, Mount Diablo Baseline and Meridian
Latitude/Longitude:	36.817221° / –119.916142°
Topography:	Relatively flat, approximately 290 feet above mean sea level
Approximate Depth to Groundwater:	105 feet below ground surface (bgs), Groundwater Information Center Interactive Map Application (GICIMA), Fall 2018.
Regional Groundwater Flow Direction:	Southwest, GICIMA, Fall 2018

3.1 Geology and Hydrogeology

The subject site is located within the San Joaquin Valley, a broad structural trough bound by the Sierra Nevada and Coast Ranges of California. The San Joaquin Valley, which comprises the southern portion of the Great Valley of California, has been filled with several thousand feet of sedimentary deposits. Sediments in the eastern valley, derived from the erosion of the Sierra Nevada, have been deposited by major to minor west-flowing drainages and their tributaries. Near-surface sediments are dominated by sands and silty sands with lesser silts, minor clays, and gravel. The sedimentary deposits in the region form large coalescing alluvial fans with gentle slopes. The groundwater in the area is reported to be first encountered at a depth of approximately 105 feet bgs. The groundwater flow direction in the area of the subject site is generally towards the southwest.

4.0 SITE RECONNAISSANCE

A site reconnaissance, which included a visual observation of the subject site and surrounding properties, was conducted by Michael Bowery, Krazan's Environmental Professional, on November 1, 2019. Krazan's Environmental professional was unaccompanied during the site reconnaissance. The objective of the site reconnaissance is to obtain information indicating the likelihood of identifying recognized

environmental conditions, including hazardous substances and petroleum products, in connection with the property (including soils, surface waters, and groundwater).

4.1 Observations

The following Table II summarizes conditions encountered during our site reconnaissance. A discussion of visual observations follows Table II. Refer to the Site Map (Figure No. 3) and color photographs following the text for the locations of items discussed in this section of the report.

TABLE II
Summary of Site Reconnaissance

Feature	Observed	Not Observed
Structures (existing)		X
Evidence of Past Uses (foundations, debris)	X	
Hazardous Substances and/or Petroleum Products (including containers)		X
Aboveground Storage Tanks (ASTs)		X
Underground Storage Tanks (USTs) or Evidence of USTs		X
Evidence of Underground Pipelines		X
Strong, Pungent, or Noxious Odors		X
Pools of Liquid Likely to be Hazardous Materials or Petroleum Products		X
Drums		X
Unidentified Substance Containers		X
Potential Polychlorinated Biphenyl (PCB)-Containing Equipment		
Subsurface Hydraulic Equipment		X
Heating/Ventilation/Air conditioning (HVAC)		X
Stains or Corrosion on Floors, Walls, or Ceilings		X
Floor Drains, Sumps, or Oil/Water Clarifiers		X
Storm Drains		X
Pits, Ponds, or Lagoons		X
Stained Soil and/or Pavement		X
Soil Piles		X
Stressed Vegetation	X	
Waste or Wastewater (including stormwater) Discharges to Surface/ Surface Waters		X
Wells (irrigation, domestic, dry, injection, abandoned, monitoring wells)	X	
Septic Systems		X

The subject site comprises approximately 29.84 acres of vacant land with the Fresno County APN 505-060-07. Refer to Figure No. 3, Site Map, for locations of the following referenced on-site features:

- The subject site was observed to be vacant land that showed evidence of previous agricultural usage including numerous uprooted orchard trees (see Photos 1 through 4, 7 and 8)). A small portion of the southwest area of the subject had been graded flat (see Photos 1 and 2) with all trees and weeds removed.
- The Herndon Canal runs east-west along the northern property boundary and then turns north-south and runs along the eastern property boundary (see Photos 5 and 6).

- A former irrigation system was observed throughout the subject site tending from east to west and consists of numerous valves and concrete boxes (see Photo 9). A former water well was located on the east side of the property near the intersection of the Herndon Canal and Epstein Canal (see Photo 11). The pump for the well had apparently been removed. Two (2) electrical poles were also part of the irrigation system (See Photos 11 and 12).
- A sewer manhole was also present along the western property boundary between two (2) irrigation boxes (see Photo 9).
- A soil pile (see Photo 10) was located near the former water well along the eastern property boundary. The soil pile had some burnt material on top of the pile.
- Scattered trash and debris (mattresses, kitchen appliances, household trash, etc.) were present in the area of the former water well (see Photos 10, 11 and 12) and a small debris field was present near the mid-point of the southern property boundary (see Photo 14).
- During the visual observations of the subject site, no hazardous materials or hazardous waste were observed. Exposed surface soils did not exhibit obvious signs of discoloration. No major depressions were observed on the subject site. No obvious evidence (vent pipes, fill pipes, dispensers, etc.) of USTs was noted within the areas observed. No indications of former structures, such as foundations, were observed on the subject site.
- No high-voltage, tower-mounted electrical transmission lines were observed on or in the vicinity of the subject site.

4.2 Utilities

Based on Krazan's research, the following Table III summarizes companies/municipalities that will provide utility services to the subject site:

TABLE III
Municipal Service / Utility Providers

Service / Utility	Provider
Electricity	Pacific Gas & Electric Company (PG&E)
Natural Gas	Pacific Gas & Electric Company (PG&E)
Potable Water	City of Fresno upon future development
Sanitary Sewer	City of Fresno upon future development

4.3 Adjacent Streets and Property Usage

The following Table IV summarizes the current adjacent roads and adjacent property uses observed during the site reconnaissance (see Photos 15, 16, 17, and 18).

TABLE IV
Adjacent Streets and Property Use

Direction	Adjacent Street	Adjacent Property Use
North	None/Herndon Canal	Residential
South	None	Residential/Vacant Land
East	None/Herndon Canal	Undeveloped Land
West	N. Grantland Avenue	Residential

Based on the observed uses of the properties located immediately adjacent to the subject site, it is unlikely that significant quantities of hazardous materials are stored at the adjacent properties.

4.4 ASTM Non-Scope Considerations

According to ASTM E 1527-13, there may be environmental issues or conditions at the subject site that are outside the scope of the Phase I ESA practice (non-scope considerations). Some substances may be present at the subject site in quantities and under conditions that may lead to contamination of the subject site or of nearby properties but are not included in CERCLA's definition of hazardous substances (42 U.S.C. §9601[14]). ASTM non-scope considerations are discussed below.

Asbestos-Containing Materials

Asbestos is a group of naturally occurring mineral fibers that have been used commonly in a variety of building construction materials for insulation and as a fire-retardant. Because of its fiber strength and heat resistant properties, asbestos has been used for a wide range of manufactured goods, mostly in building materials, vehicle brakes, and heat-resistant fabrics, packaging, gaskets, and coatings. When asbestos-containing materials (ACMs) are damaged or disturbed by repair, remodeling, or demolition activities, microscopic asbestos fibers may become airborne and can be inhaled into the lungs, where they can cause significant health problems.

No structures are located on the subject site. Therefore, ACMs are not considered an on-site environmental concern at this time.

Lead-Based Paint

Although lead-based paint (LBP) was banned in 1978, many buildings constructed prior to 1978 have paint that contains lead. Lead from paint, chips, and dust can pose serious health hazards if not addressed properly.

No structures are located on the subject site. Therefore, LBP is not considered an on-site environmental concern at this time.

Mold and Moisture Intrusion

A class of fungi, molds have been found to cause a variety of health problems in humans, including allergic, toxicological, and infectious responses. Molds are decomposers of organic materials, and thrive in humid environments, and produce spores to reproduce, just as plants produce seeds. When mold spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on

in order to survive. When excessive moisture or water accumulates indoors, mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. As such, interior areas of buildings characterized by poor ventilation and high humidity are the most common locations of mold growth. Building materials including drywall, wallpaper, baseboards, wood framing, insulation and carpeting often play host to such growth. Moisture control is the key to mold control. Molds need both food and water to survive; since molds can digest most things, water is the factor that limits mold growth. The EPA recommends the following action to prevent the amplification of mold growth in buildings:

- Fix leaky plumbing and leaks in the building envelope as soon as possible.
- Watch for condensation and wet spots. Fix source(s) of moisture problem(s) as soon as possible.
- Prevent moisture due to condensation by increasing surface temperature or reducing the moisture level in air (humidity). To increase surface temperature, insulate or increase air circulation. To reduce the moisture level in air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).
- Keep heating, ventilation, and air conditioning (HVAC) drip pans clean, flowing properly, and unobstructed.
- Vent moisture-generating appliances, such as dryers, to the outside where possible.
- Maintain low indoor humidity, below 60% relative humidity (RH), ideally 30-50%, if possible.
- Perform regular building/HVAC inspections and maintenance as scheduled.
- Clean and dry wet or damp spots within 48 hours.
- Do not let foundations stay wet. Provide drainage and slope the ground away from the foundation.

No structures are currently located on the subject site. Therefore, microbial growth and moisture intrusion are not considered an on-site environmental concern at this time.

Radon

Radon is a radioactive gas that is found in certain geologic environments and is formed by the natural breakdown of radium, which is found in the earth's crust. A radon survey was not included within the scope of this investigation; however, the State of California Department of Health Services (CDHS) maintains a statewide database of radon results in designated geographic areas. Radon detection devices are placed in homes throughout the study region to determine geographic regions with elevated radon concentrations. The U.S. EPA has set the safety standard for radon gas in homes to be 4.0 pico Curies per liter (pCi/L).

The US EPA has prepared a map to assist National, State and local organizations to target their resources and to implement radon-resistant building codes. The map divides the country into three Radon Zones,

Zone 1 being those areas with the average predicted indoor radon concentration in residential dwellings exceeding the EPA Action Limit of 4.0 pCi/L. It is important to note that the EPA has found homes with elevated levels of radon in all three zones, and the EPA recommends site-specific testing in order to determine radon levels at a specific location. However, the map does give a valuable indication of the propensity of radon gas accumulation in structures. Review of the EPA Map of Radon Zones places the Property in Zone 2, where average predicted radon levels are between 2.0 and 4.0 pCi/L. Therefore, the available data suggests that the potential for radon to adversely impact the subject site appears to be low.

Wetlands

As defined by the U.S. EPA and the Department of Army, Corps of Engineers, wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Jurisdictional wetlands are regulated under Section 404 of the Clean Water Act (1972, 1977, and 1987, and also the 1985 and 1990 Farm Bills), and are important for protection of aquatic waterfowl and species, water purification, and flood control. According to current Corps of Engineers information, three basic criteria are currently used to define wetlands:

- Wetland hydrology - areas exhibiting surface or near-surface saturation or inundation at some point in time (greater than 12.5 percent of growing season defined on basis of frost-free days) during an average rainfall year.
- Hydrophilic vegetation - frequency of occurrence of wetland indicator plants (plant life growing in water, soil, or substrate that is periodically deficient in oxygen as a result of excessive water content).
- Hydric soil - landscape patterns identified by saturation, flooding, or ponding long enough during the growing season (generally seven days) which develop characteristic color changes in the upper part of the soil as a result of anaerobic conditions.

Based on Krazan's reconnaissance of the subject site, evidence was not apparent to suggest that the site contained a wetland. Furthermore, according to the U. S. Fish & Wildlife Service (USFWS) National Wetlands Inventory available via the USFWS Internet website, the subject site does not contain a designated wetland. Therefore, at this time, regulations pertaining to wetlands do not appear to impact the subject site.

Environmental Non-Compliance Issues

No obvious material non-compliance issues were identified in connection with the subject site in the process of preparing this report.

5.0 USER-PROVIDED INFORMATION

A review of user-provided information was conducted in order to help identify pertinent information regarding potential environmental impacts associated with the subject site.

5.1 Environmental Lien Search

A Final Title Report or Environmental Lien Search were not prepared by or provided to Krazan during the course of this assessment.

5.2 Title Report

A Preliminary Title Report (PTR) dated September 11, 2019, prepared for the subject site by North American Title Company, was provided to Krazan by the Phase I ESA User. Krazan's review of the PTR indicated no deed restrictions, environmental liens or AULs for the subject site. However, as quoted from the subject site PTR, "It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land." The absence of a Final Title Report or Environmental Lien Search represents a data gap. Please refer to Appendix A for a copy of the PTR.

5.3 Phase I Environmental Site Assessment User Questionnaire

In order to qualify for one of the *Landowner Liability Protections (LLPs)* offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the *Brownfields Amendments*), the *user* must provide the following information (if available) to the *environmental professional*. Failure to provide this information could result in a determination that *all appropriate inquiry* is not complete. The user is asked to provide information or knowledge of the following:

1. Environmental cleanup liens that are filed or recorded against the site.
2. Activity and land use limitations that are in place on the site or that have been filed or recorded in a registry.
3. Specialized knowledge or experience of the person seeking to qualify for the LLPs.
4. Relationship of the purchase price to the fair market value of the *property* if it were not contaminated.
5. Commonly known or *reasonably ascertainable* information about the *property*.
6. The degree of obviousness of the presence or likely presence of contamination at the *property*, and the ability to detect the contamination by appropriate investigation.
7. The reason for preparation of this Phase I ESA.

On November 4, 2019, a completed Phase I ESA User Questionnaire was received from Ms. Wendy Erickson with Lennar Homes of California, the Phase I ESA user. Please refer to Appendix B for a copy of the completed Phase I ESA user questionnaire.

According to the questionnaire responses, Ms. Erickson, to the best of her knowledge as the user of this Phase I ESA, was not aware of any environmental cleanup liens and activity or land use limitations which have been filed or recorded against the subject site; and Ms. Erickson has no specialized knowledge or experience of the prior nature of the business or chemical utilization on the subject site. Ms. Erickson indicated that she has no knowledge of the historical uses of the subject site. Ms. Erickson indicated that she did not have knowledge of the past or current presence of specific chemicals or hazardous materials, unauthorized spills or chemical releases or of any environmental cleanups in connection with the subject site. Ms. Erickson indicated that she is not aware of any contamination issues to soil or groundwater either at the subject property or in the vicinity of the subject property. Ms. Erickson stated that the purchase price of the subject site reasonably reflects fair market value. Additionally, Ms. Erickson indicated that the reason for preparation of this Phase I ESA is related to a property purchase.

6.0 SITE USAGE SURVEY

The property usage survey included assessing property history, conducting interview(s) with person(s) knowledgeable of the previous and current ownership and uses of the subject site, and reviewing local, state, and federal regulatory agency records.

6.1 Site History

A review of historical aerial photographs, a USGS topographic quadrangle map, contact with the Fresno County Public Works and Development Department (FCPWDD) records, reasonably ascertainable city directories, and a search for historical Sanborn fire insurance maps (SFIMs) were utilized to assess the history of the subject site.

Aerial Photograph Interpretation

Historical aerial photographs dated 1937, 1946, 1957, 1967, 1979, 1987, 1998, 2009, 2016, and 2018 were reviewed to assess the history of the subject site. These photographs were obtained from Environmental Data Resources Inc. (EDR). The aerial photograph summary is provided in the following Table V. Please refer to Appendix C for a copy of the historical aerial photographs.

TABLE V
Summary of Aerial Photograph Review

Year/Scale	Site Use	Site and Adjacent Property Observation
1937 1" = 500'	Mixture of Agricultural/ Orchards, Vacant Land and Multiple Farm Buildings	The subject site appears to be utilized for agricultural purposes on the northern portion of the site with vacant land to the south. A group of farm building is present near the west-central portion of the subject site. The adjacent properties to the north, south and west are agricultural, whereas, the adjacent property to the east appears to be vacant land. The surround properties also appears to be used for agricultural purposes. The Herndon and Epstein Canals are also present.
1946 1'= 500'	Mixture of Agricultural/ Orchards, Vacant Land and Multiple Farm Buildings	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 1937 aerial photograph.
1957 1'= 500'	Agricultural/ Orchards and Multiple Farm Buildings	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 1946 aerial photograph with the exception that the entire subject site near appears to be agricultural. The adjacent property to the east is also now agricultural.
1967 1'= 500'	Agricultural/ Orchards and Multiple Farm Buildings	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 1957 aerial photograph.
1979 1" = 500'	Agricultural/ Orchards and Multiple Farm Buildings	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 1967 aerial photograph with the exception that additional farm/residential structures are now present to the northeast of the subject site.
1987 1" = 500'	Agricultural/ Orchards and Multiple Farm Buildings	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 1979 aerial photograph with the exception that adjacent residential structures are now present near southwest corner of subject site along N. Grantland Avenue.
1998 1" = 500'	Agricultural/ Orchards and Multiple Farm Buildings	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 1987 aerial photograph.
2009 1" = 500'	Agricultural/ Orchards	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 1998 aerial photograph with the exception that there are no farm structures present on the subject site. In addition, a residential housing track is now present adjacent to the west of the subject site across N. Grantland Avenue.
2016 1" = 500'	Vacant Land	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 2009 aerial photograph with the exception that the subject site now appears to be vacant land and the housing track to the west has expanded.

TABLE V (continued)
Summary of Aerial Photograph Review

Year/Scale	Site Use	Site and Adjacent Property Observation
2018 Not to Scale	Vacant Land	Conditions on the subject site and the adjacent properties appear relatively similar to those noted in the 2016 aerial photograph with the exception that the southern one-third to one-half of the subject site appears to be burned. The housing track to the west has continued to expand and now is present along the entire western property boundary of the subject site.

USGS Topographic Quadrangle Map

Krazan's review of the USGS, 7.5 minute, Herndon, California topographic quadrangle map dated 1964, photo-inspected 1978 indicates that one (1) structure was located on the subject site. The subject site is situated at an elevation of approximately 290 feet above MSL. No evidence of fill areas or landfills are depicted on the subject site or the adjacent properties. Refer to Figure No. 4, Topographic Map, for reference.

City of Fresno Planning and Development Department

The CFPDD was contacted on October 30, 2019, to review building permits for the subject site parcel. According to representatives of the CFPDD, no permits are file for the street address. Therefore, no permits for items such as underground storage tanks, septic systems, building, demolition, or previous structures are on file with the CFPDD for the subject site.

City Directories

City directories were not searched due to the current and historical absence of structures associated with the subject site.

Sanborn Fire Insurance Maps

Krazan reviews SFIMs to evaluate prior land use of the subject site and the adjacent properties. SFIMs typically exist for cities with populations of 2,000 or more, the coverage dependent on the location of the subject site within the city limits. On October 30, 2019, Krazan contracted with EDR to provide copies of available SFIMs for the subject site and the adjacent properties as far back as 1867. EDR's search of SFIMs revealed no coverage for the subject site and the adjacent properties. Please refer to Appendix D for a copy of the EDR SFIM *Unmapped Property* Report.

6.2 Interviews

Krazan seeks to conduct interviews with the current and previous owners of the subject site. The interviews are designed to provide pertinent information regarding potential environmental impacts associated with the subject site.

Subject Site Owner

Krazan's attempt to conduct an interview with the owner of the subject site proved unsuccessful. As of the date of this report, contact information for the owner of the subject site was unavailable, and Krazan's attempt to obtain contact information for the property owner by alternate means proved unsuccessful. Consequently, information regarding property history and historical uses of the subject site was not obtained from the owner of the subject site. The absence of such information obtained from an interview with the property owner constitutes a data gap.

Subject Site Occupants

An occupant was not identified in connection with the subject site. Therefore, an interview with a subject site occupant was not conducted.

Previous Subject Site Owner

An interview with a previous owner/occupant of the subject site was not reasonably ascertainable. Consequently, information regarding the history and historical uses of the subject site obtained from an interview of a previous owner and/or occupant constitutes a data gap.

6.3 Agricultural Chemicals

Review of historical aerial photographs indicates that the subject site was utilized for agricultural purposes in the form of row crops and later orchards from at least 1937 to at least 2009. Although the potential exists that environmentally persistent pesticides/herbicides were historically applied to the crops grown on the subject site, 1) no material evidence of the use of environmentally persistent pesticides/herbicides was obtained during the course of this assessment and 2) it is anticipated that environmentally persistent pesticides/herbicides potentially located on site will be dislocated/diluted as a result of the trenching and rough grading operations conducted at the time of development. Therefore, given the above-referenced factors and Krazan's experience in the subject site vicinity which generally indicates that the potential is low for elevated concentrations of environmentally persistent pesticides/herbicides related to agricultural cultivation to exist in the near-surface soils of common agricultural ground at concentrations which would require regulatory action, the potential for elevated concentrations of environmentally persistent pesticides/herbicides to currently exist in the near-surface

soils of the subject site at concentrations which would require regulatory action appears to be low. However, the specific usage circumstances or condition of the subject site soils related to historical agricultural cultivation are unknown.

6.4 Regulatory Agency Interface

A review of regulatory agency records was conducted to help determine if hazardous materials have been handled, stored, or generated on the subject site and/or the adjacent properties and businesses. Regulatory records are reviewed based on the following criteria: 1) properties with known soils and/or groundwater releases considered to represent the potential for impact to the subject site that are located within 1,760 feet of the subject site for constituents of concern impacts or 528 feet of the subject site for petroleum hydrocarbon impacts; 2) properties that are adjacent or in proximity to the subject site included within the EDR regulatory database report or noted during the site reconnaissance to possibly handle, store, or generate hazardous materials. Applicable property records are discussed below.

Fresno County Department of Community Health, Environmental Health System

The Fresno County Department of Community Health, Environmental Health System (FCEHS) is the lead regulatory agency or Certified Unified Program Agency (CUPA) for hazardous materials handling facilities in Fresno County. Krazan's review of the FCEHS CUPA and Solid Waste Programs Resource List (CUPA List) dated October 30, 2019, indicated that no records are on file with the FCEHS for the subject site. Additionally, Krazan's October 30, 2019, review of the FCEHS Environmental Health Document Portal Website indicated that no records are on file with the FCEHS for the subject site.

City of Fresno Fire Department

The City of Fresno Fire Department (CFFD) has jurisdiction for the fire protection for the subject site and the immediate vicinity. According to representatives of the CFFD, records of hazardous materials incidents are kept by the FCEHS. Additionally, hazardous/flammable incidents are filed according to the date of occurrence and by the location of occurrence with the FCEHS.

State of California Regional Water Quality Control Board - Geotracker

Krazan's October 30, 2019, review of the State of California Regional Water Quality Control Board (RWQCB) Geotracker database available via the RWQCB Internet Website indicated that no LUST sites, cleanup program sites, land disposal sites, or military sites are listed for the subject site, the adjacent properties, or properties located within the subject site vicinity. Additionally, no permitted UST sites were determined to be located on or adjacent to the subject site.

State of California Department of Toxic Substances Control - Envirostor

Krazan's October 30, 2019, review of the State of California Department of Toxic Substances Control (DTSC) Envirostor database available via the DTSC's Internet Website indicated that no sites including State response sites, voluntary cleanup sites, school cleanup sites, or military or school evaluation sites are listed for the subject site and adjacent or vicinity properties.

California Department of Conservation, Division of Oil, Gas and Geothermal Resources - DOMS

On October 30, 2019, Krazan's review of the State of California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) Online Mapping System (DOMS) indicated that no plugged and abandoned or producing oil wells are located on or adjacent to the subject site.

Local Area Tribal Records

No Indian reservations, USTs on Indian land, or LUSTs on Indian land were reported on the subject site, adjacent properties, or vicinity properties in the EDR-provided government database report.

6.5 Regulatory Agency Lists Review

Several agencies have published documents that list businesses or properties which have handled hazardous materials or waste or may have experienced site contamination. The lists consulted in the course of our assessment were compiled by EDR and Krazan and represent reasonably ascertainable current listings. Krazan did not verify the locations and distances of every property listed by EDR. Krazan verified the location and distances of the properties Krazan deemed as having the potential to adversely impact the subject site. The actual location of the listed properties may differ from the EDR listing. Refer to the Map Findings Summary in the following Table VI, within the EDR Radius Map Report, and shown below, for a summary of the listed properties located within the specified ASTM Search Radii. The actual distances of the listed properties (which are summarized below) are based on observations during Krazan's site reconnaissance. No EDR-listed unmapped (non-geocoded) sites were determined to be located on or adjacent to the subject site. Please refer to Appendix E for a copy of the EDR Radius Map report.

TABLE VI
Summary of Findings

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	1.000		0	0	0	0	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
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	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		0	0	NR	NR	NR	0
RCRA-VSQG	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	0.001		0	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	2	NR	2
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

TABLE VI (continued)
Summary of Findings

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
CPS-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	0	NR	NR	NR	0
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		0	0	0	NR	NR	0
HAULERS	0.001		0	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
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	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	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		1	0	NR	NR	NR	1
HIST UST	0.250		1	0	NR	NR	NR	1
CERS TANKS	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		1	0	NR	NR	NR	1
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

TABLE VI (continued)
Summary of Findings

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
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	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	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	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	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	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		1	1	NR	NR	NR	2

TABLE VI (continued)
Summary of Findings

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
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	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	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	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	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		0	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		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	4	1	0	2	0	7

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

The subject site address/location or adjacent properties were not listed in the EDR Radius Map Report.

No sites with reported releases of hazardous materials to the subsurface were reported within the subject site vicinity. In general, potentially hazardous materials released from facilities located approximately hydraulically upgradient within subject site vicinity, or in a hydraulically cross-gradient direction in proximity to the site, may have a reasonable potential of migrating to the subject site via groundwater flow. This opinion is based on the assumption that non-vaporous hazardous materials generally do not migrate large distances laterally within the soil, but rather tend to migrate with groundwater in the general direction of groundwater flow.

Hazardous Materials Migration in Vapor

Hazardous materials or petroleum product vapors which may have the potential to migrate into the subsurface of the subject site may be caused by the release of vapors from contaminated soil or groundwater either on or in the vicinity of the subject site from current or historical uses of the subject site and/or adjacent or vicinity properties. Current or past land uses such as gasoline stations (using petroleum hydrocarbons), dry cleaning establishments (using chlorinated volatile organic compounds), former manufactured gas plant sites (using volatile and semi-volatile organic compounds), and former industrial sites such as those that had vapor degreasing or other parts-cleaning operations (using chlorinated volatile organic compounds) are of particular concern. Constituent of concern vapors are capable of migrating great distances omni-directionally along subsurface conduits such as pipelines, utility lines, sewer and stormwater lines, and building foundations.

Based on Krazan's observations and review of the EDR regulatory database report, no listings of concern were determined to be associated with the subject site, adjacent properties, or properties located within the subject site vicinity. However, the screening process for vapor migration in connection with the subject site is described in the ASTM E 2600-10 *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions,* an industry consensus methodology to assess vapor migration which is not included in the scope of work of this Phase I ESA.

No engineering control sites, sites with institutional controls, or sites with deed restrictions were listed for the subject site, adjacent sites or vicinity properties in the EDR Report.

7.0 DISCUSSION OF FINDINGS

TABLE VII
Summary of Conclusions

Apparent Evidence of RECs or PAOCs From:	Not Noted	Noted
Historical Uses		X
Current Uses	X	
Adjacent or Vicinity Property Uses	X	

Historical Uses

Based on Krazan's review of historical aerial photographs, a site reconnaissance, and contacts with the local regulatory agencies and the owner of the subject site, there is no evidence that RECs exist in connection with the historical uses of the subject site. However, potential areas of concern were identified which are discussed in Section 8.0 of this report.

Current Uses

Based on Krazan's site reconnaissance, contacts with State and local regulatory agencies, and an interview with the subject site owner, there is no evidence that RECs exist in connection with the current uses of the subject site.

Adjacent or Vicinity Property Uses

Based on Krazan's review of historical research of the subject site, a site reconnaissance, contacts with the State and local regulatory agencies and review of the EDR regulatory database report, there is no evidence that RECs exist in connection with the subject site from adjacent or vicinity property uses.

7.1 Evaluation of Data Gaps/Data Failure

In accordance with ASTM E 1527-13 guidance, data gaps represent a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice. Data failure represents the failure to achieve the historical research objectives of this practice even after reviewing the standard historical sources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap. The following is a summary of data gaps encountered in the process of preparing this report including an observation as to the presumed significance of that data gap to the conclusions of this assessment.

- Absence of Final Title Report or Environmental Lien Search (Section 5.1)

  A Final Title Report or Environmental Lien Search were not provided by the Phase I ESA user; therefore a data gap exists. Taken in consideration with the available information obtained in the course of preparing this report in conjunction with professional experience, there is no evidence to suggest that this data gap might alter the conclusions of this assessment. However, the contents of a Final Title Report or Environmental Lien Search are unknown.

- Absence of Interview with Current or Previous Property Owner/Occupant (Section 6.2)

  A Phase I ESA interview with the current or previous owner/occupant of the subject site was not reasonably ascertainable. Consequently, information regarding the history and historical uses of the subject site obtained from an interview of a current or previous owner and/or occupant constitutes a data gap. Taken in consideration with the available information obtained in the course of preparing this report in conjunction with professional experience, there is no evidence to suggest that this data gap might alter the conclusions of this assessment. However, the contents of an interview with a current or previous property owner/occupant are unknown.

8.0 CONCLUSIONS/OPINIONS

We have conducted a Phase I ESA of the subject site in conformance with the scope and limitations of the ASTM E 1527-13 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* guidance documents. Any deviations from this practice were previously described in this report. During the course of this assessment, Krazan identified no evidence of recognized environmental conditions (RECs), controlled RECs (CRECs) or historical RECs (HRECs) in conjunction with the subject site as defined by ASTM E 1527-13. However, the following potential areas of concern (PAOCs) and site development issues are presented:

PAOCs

- During Krazan's November 1, 2019 site reconnaissance, a soil pile was observed along the eastern property boundary. There was no evidence of ground disturbance from construction or grading operations near the soil pile, and the soil pile is at the intersection of the Herndon and Epstein Canals. No evidence of soil staining, odors or stressed vegetation was observed within or adjacent to the soil pile. Krazan's experience indicates that imported soil can be contaminated with agricultural chemicals or other hazardous materials, dependent upon the specific location from which the soil is derived, and that the risk of contamination is increased for illegally disposed soils. Given the absence of specific information concerning the source or composition of the on-site soil pile, the presence or absence of potential significant concentrations of hazardous materials in the on-site soil pile is unknown.

- Krazan's review of historical aerial photographs indicates that residential and farm-type structures were located in the central western portion of the subject site from at least 1937 until at least 1998 and that the subject site and immediately proximate properties were being utilized for agricultural purposes during this time interval. Historical uses of the subject site prior to 1937 were not reasonably ascertainable utilizing the standard historical references consulted during this assessment, and it is therefore unknown how long the subject site was developed with structures prior to 1937. Underground storage tanks (USTs) on rural or agricultural properties historically have been exempt from requirements for registration with regulatory agencies. Krazan's experience with such properties has shown that it is not uncommon for property owners/operators to install USTs for their convenience, especially in the vicinity of structures, which are undocumented and whose presence would remain unknown in spite of the standard data research conducted in the course of this Phase I ESA and despite the subsequent cultivation of crops in the former farm area. It is therefore possible that subsurface features such as unregistered USTs may exist in the vicinity of the former on-site structures which remain unknown based upon the absence of any regulatory, municipality, interview data, or other evidence indicating their presence or location. Consequently, despite an absence of data suggesting their presence, the presence or absence of USTs associated with the subject site in a historical agricultural setting is unknown.

SITE DEVELOPMENT ISSUES

- Based on Krazan's site reconnaissance of the subject site, a former irrigation system was observed throughout the subject site trending from east to west which consisted of numerous valves and concrete boxes. An inactive water well was located on the east side of the property near the intersection of the Herndon Canal and Epstein Canal. The pump for the well had apparently been removed. Two (2) electrical poles were also part of the irrigation system. If the on-site water well and irrigation system are not involved in redevelopment of the subject site, they should be properly abandoned/destroyed in accordance with state and local guidelines.

9.0 RELIANCE

This report was prepared solely for use by Client and should not be provided to any other person or entity without Krazan & Associates' prior written consent. No party other than Client may rely on this report without Krazan & Associates' express prior written consent. Reliance rights for third parties will only be in effect once requested by Client and authorized by Krazan & Associates with authorization granted by way of a Reliance Letter. The Reliance Letter will require that the relying party(ies) agree to be bound to the terms and conditions of the agreement between Client and Krazan & Associates as if originally issued to the relying party(ies), or as so stipulated in the Reliance Letter.

10.0 LIMITATIONS

This reconnaissance and review of the subject site has been limited in scope. This type of investigation is undertaken with the calculated risk that the presence, full nature, and extent of contamination would not be revealed by visual observation alone. Although a thorough site reconnaissance was conducted in accordance with ASTM Guidelines and employing a professional standard of care, no warranty is given, either expressed or implied, that hazardous material contamination or buried structures, which would not have been disclosed through this investigation, do not exist at the subject site. Therefore, the data obtained are clear and accurate only to the degree implied by the sources and methods used.

The findings presented in this report were based upon field observations during a single property visit, review of available data, and discussions with local regulatory and advisory agencies. Observations describe only the conditions present at the time of this investigation. The data reviewed and observations made are limited to accessible areas and currently available records searched. Krazan cannot guarantee the completeness or accuracy of the regulatory agency records reviewed. Additionally, in evaluating the property, Krazan has relied in good faith upon representations and information provided by individuals noted in the report with respect to present operations and existing property conditions, and the historic uses of the property. It must also be understood that changing circumstances in the property usage, proposed property usage, subject site zoning, and changes in the environmental status of the other nearby properties can alter the validity of conclusions and information contained in this report. Therefore, the data obtained are clear and accurate only to the degree implied by the sources and methods used.

This report is provided for the exclusive use of the client noted on the cover page and shall be subject to the terms and conditions in the applicable contract between the client and Krazan. Any third party use of this report, shall also be subject to the terms and conditions governing the work in the contract between the client and Krazan. The unauthorized use of, reliance on, or release of the information contained in this report without the express written consent of Krazan is strictly prohibited and will be without risk or liability to Krazan.

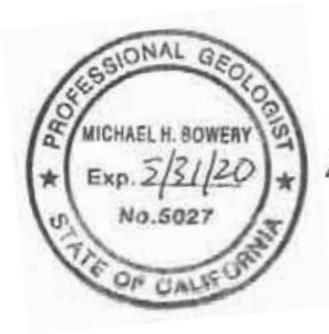
Conclusions and recommendations contained in this report are based on the evaluation of information made available during the course of this assessment. It is not warranted that such data cannot be superseded by future environmental, legal, geotechnical or technical developments. Consequently, given the possibility for unanticipated hazardous conditions to exist on a subject site which may not have been discovered, this Phase I ESA is not intended as the basis for a buyer or developer of real property to

waive their rights of recovery based upon environmental unknowns. Parties that choose to waive rights of recovery prior to site development do so at their own risk.

Parties who seek to rely upon Phase I Environmental Site Assessment reports dated more than 180 days prior to the date of reliance do so at their own risk. This limitation in reliance is based on the potential for physical changes at the site, changes in circumstances, technological and professional advances, and guidance related to the continued viability of Environmental Site Assessment reports, user's responsibilities, and requirements for updating of components of the inquiry as stated in the ASTM Standard E 1527-13.

11.0 QUALIFICATIONS

This Phase I ESA was conducted under the supervision or responsible charge of Krazan's undersigned environmental assessor with oversight from the undersigned environmental professional. The work was conducted in accordance with ASTM E 1527-13, generally accepted industry standards for environmental due diligence in place at the time of the preparation of this report, and Krazan's quality-control policies.
We declare that, to the best of our professional knowledge and belief, we meet the definition of environmental professional as defined in §312.10 of 40 CFR 312 and we have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

Michael H. Bowery, PG 5027
Senior Manager

Arthur C. Farkas, REA
Environmental Professional

MHB/ACF/mlt

REFERENCES

Aerial photographs obtained from Environmental Data Resources, Inc. (EDR).

American Society for Testing and Materials (ASTM), *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment (ESA) Process*, ASTM Designation: E 1527-13.

ASTM, *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions,* ASTM Designation E 2600-10.

City of Fresno Planning and Development Department (CFPDD).

Environmental Data Resources, Inc. (EDR), Sanborn Fire Insurance Map *Unmapped Property* Report.

Environmental Data Resources, Inc. (EDR), Regulatory Database Report.

Fresno County Department of Community Health, Environmental Health System, Environmental Health Document Portal Website: http://www.fresnohealthinspections.org

Fresno County Department of Community Health, Environmental Health System, Master Hazardous Materials Handling Facilities List, April 2018.

Erickson, Wendy, with Lennar Homes of California, the Phase I User.

State of California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) Maps Website: http://www.conservation.ca.gov/dog/maps/Pages/index_map.aspx

State of California Department of Toxic Substances Control, Envirostor Website: http://www.envirostor.dtsc.ca.gov/public

State of California Regional Water Quality Control Board, Geotracker Website: http://geotracker.swrcb.ca.gov

State of California, *Groundwater Information Center Interactive Map Application*, Fall 2018.

U.S. Environmental Protection Agency (EPA) *Map of Radon Zones*.

U.S. Fish & Wildlife Service National Wetland Inventory *Wetlands Mapper:* http://www.fws.gov/wetlands/Data/Mapper.html

U.S. Geological Survey, 7.5 minute Herndon, California topographic quadrangle map, dated 1964, photo-inspected 1978.

GLOSSARY OF TERMS

Subject Site: The real property being investigated under this Phase I ESA.

Adjacent Properties: Properties which are contiguous with the subject site, or would be contiguous except for a street, road, or other public thoroughfare.

Subject Site Vicinity: Properties located within a 500-foot radius of the subject site.

Environmental Professional: A person meeting the education, training, and experience requirements as set forth in 40 CFR §312.10(b). The EP may be an independent contractor or an employee of the user.

User: The party seeking to use Practice E 1527 to complete an environmental site assessment of the subject site. A user may include, without limitation, a potential purchaser of the subject site, a potential tenant of the subject site, an owner of the subject site, a lender, or a property manager.

Recognized Environmental Condition (REC): In defining a standard of good commercial and customary practice for conducting an environmental site assessment of a parcel of property, the goal of the processes established by this practice is to identify recognized environmental conditions. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions.

Controlled Recognized Environmental Condition (CREC): A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). For example, if a leaking underground storage tank has been cleaned up to a commercial use standard, but does not meet unrestricted residential cleanup criteria, this would be considered a CREC. The "control" is represented by the restriction that the property use remain commercial. A condition considered by the environmental professional to be a CREC shall be listed in the findings section of the Phase I ESA report and as an REC in the conclusions section. A condition identified as a CREC does not imply that the environmental professional has evaluated or confirmed the adequacy, implementation, or continued effectiveness of the required control that has been, or is intended to be, implemented.

Historical Recognized Environmental Condition (HREC): A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release an HREC, the environmental professional must determine whether the past release is an REC at the time the Phase I ESA is conducted (for example, if there has been change in the regulatory criteria). If the EP considers the past release to be an REC at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as an REC.

GLOSSARY OF TERMS (continued)

Potential Area of Concern (PAOC): A term adopted to provide an alternative designation to the REC and HREC for a range of environmental issues related to current subject site uses, historical subject site uses, or from adjacent and/or vicinity property uses. The PAOC is utilized to emphasize full disclosure and provide the User with conclusions and recommendations related to potential environmental issues in connection with the subject site based on Krazan's professional experience in cases where official documentation or other evidence may be absent in order to identify an REC or HREC, thereby aiding the User's considerations of environmental due diligence risk tolerance.

Migrate/migration: For the purposes of this practice, "migrate" and "migration" refer to the movement of hazardous substances or petroleum products in any form, including, for example, solid and liquid at the surface or subsurface, and vapor in the subsurface. Vapor migration in the subsurface is described in ASTM E 2600-10 guidance; however, nothing in the E 1527-13 practice should be construed to require application of the E 2600-10 standard to achieve compliance with AAI.

De minimis condition: A condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Condition determined to be *de minimis conditions* are not RECS or CRECs.

Data Gap: A lack of or inability to obtain information required by this practice despite good faith efforts by the Environmental Professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice, including, but not limited to the site reconnaissance and interviews.

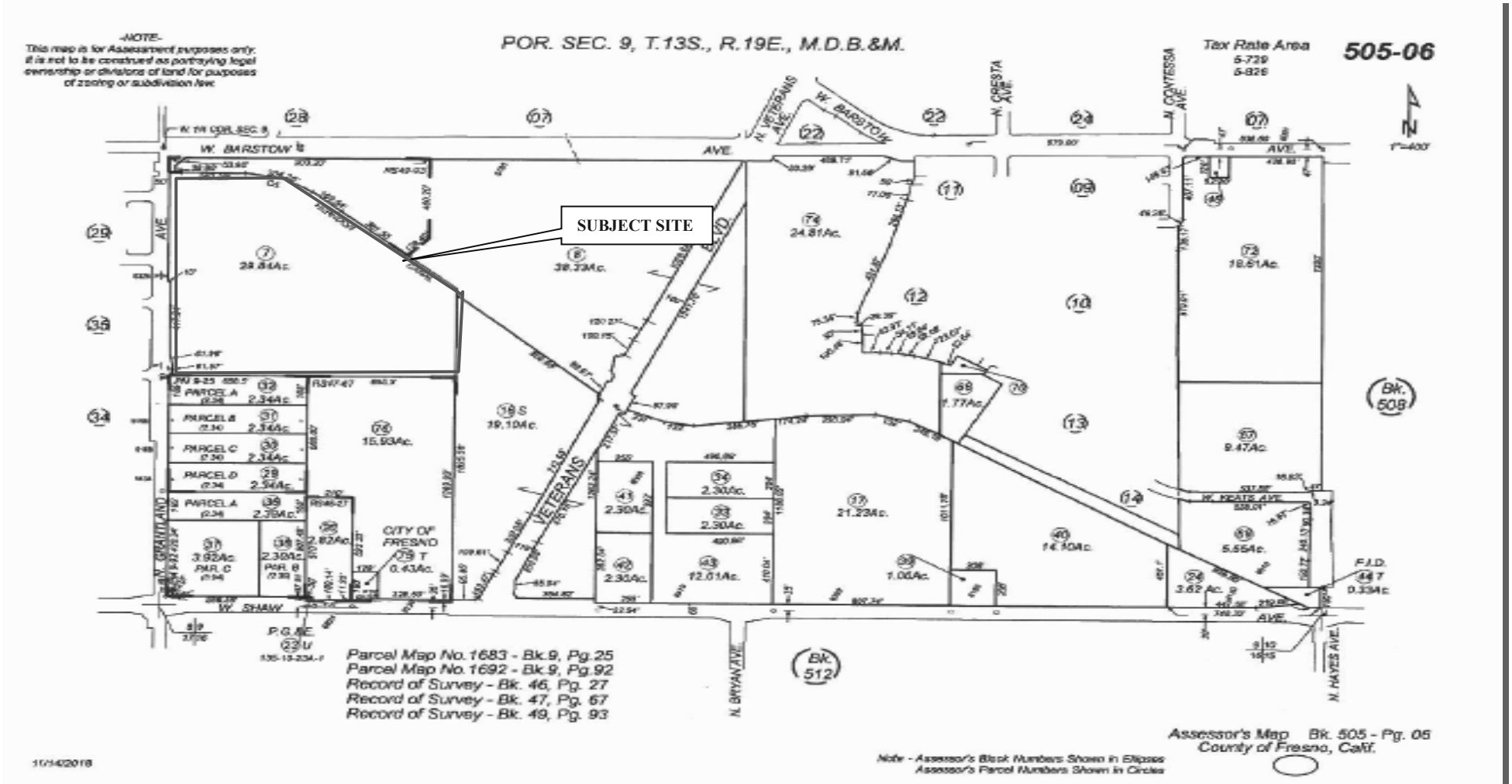
Data Failure: A failure to achieve the historical research objectives even after reviewing the standard historical sources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap.

GLOSSARY OF TERMS (continued)

AAI	All Appropriate Inquiries
AC	Asphalt Concrete
ACM	Asbestos-Containing Materials
AOC	Area of Concern
APN	Assessor's Parcel Number
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AS	Air Sparging
AUL	Activity & Use Limitations
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CMU	Concrete Masonry Unit
COCs	Constituents of Concern
DEULs	Declaration of Environmental Use Restrictions
DOGGR	Division of Oil, Gas & Geothermal Resources (CA)
DTSC	Department of Toxic Substances Control (CA)
EC	Engineering Control
EDR	Environmental Data Resources, Inc.
EP	Environmental Professional
EPA	United States Environmental Protection Agency
ERP	Emergency Response Plan
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
FOIA	Freedom of Information Act
GPR	Ground Penetrating Radar
HCCD	Haines Criss-Cross Directory
HFIM	Historical Fire Insurance Map
HMBP	Hazardous Materials Business Plan
HREC	Historical Recognized Environmental Condition
HVAC	Heating, Ventilation, Air Conditioning
IC	Institutional Control
LBP	Lead-Based Paint
LLP	Landowner Liability Protection
LQG	Large Quantity Generator
LUC	Land Use Control
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
µg/L	Micrograms Per Liter
mg/kg	Milligrams Per Kilogram
mg/L	Milligrams Per Liter
MSDS	Material Safety Data Sheet
MTBE	Methyl Tertiary Butyl Ether
MFR	Multi-Family Residential
ND	Nondetectable
NFA	No Further Action (letter)
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
O&M	Operations & Maintenance Plan
PAOC	Potential Area of Concern
PCB	Polychlorinated Biphenyl
PCC	Portland Cement Concrete
PCE	Perchloroethylene (Tetrachloroethylene)
PEC	Potential Environmental Concern (TS)
PGD	Polk Guide Directory
PG&E	Pacific Gas & Electric
PHCs	Petroleum Hydrocarbon Constituents
PID	Photoionization Detector
ppb	Parts Per Billion
ppm	Parts Per Million
PRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RP	Responsible Party
RWQCB	Regional Water Quality Control Board (CA)
SBA	Small Business Administration
SFR	Single-Family Residential
SPCC	Spill Prevention Control and Countermeasure Plan
SQG	Small Quantity Generator
SCE	Southern California Edison
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compound
SWRCB	State Water Resources Control Board
TCE	Trichloroethylene
TPH	Total Petroleum Hydrocarbons
TPH-D	Total Petroleum Hydrocarbons as Diesel
TPH-G	Total Petroleum Hydrocarbons as Gasoline
TPH-MO	Total Petroleum Hydrocarbons as Motor Oil
TS	Transaction Screen
USGS	United States Geological Survey
USFWS	United States Fish & Wildlife Service
UST	Underground Storage Tank
VEC	Vapor Encroachment Condition
VES	Vapor Encroachment Screening
VOCs	Volatile Organic Compounds



VICINITY MAP	**Scale:** NTS	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** *With Offices Serving the Western United States*
PROPOSED RESIDENTIAL DEVELOPMENT PROPERTY **5326 N GRANTLAND AVENUE** **FRESNO, CA**	**Drawn By:** MB	**Approved by:** MB	
	Project No. 014-19193	**Figure No.** 1	

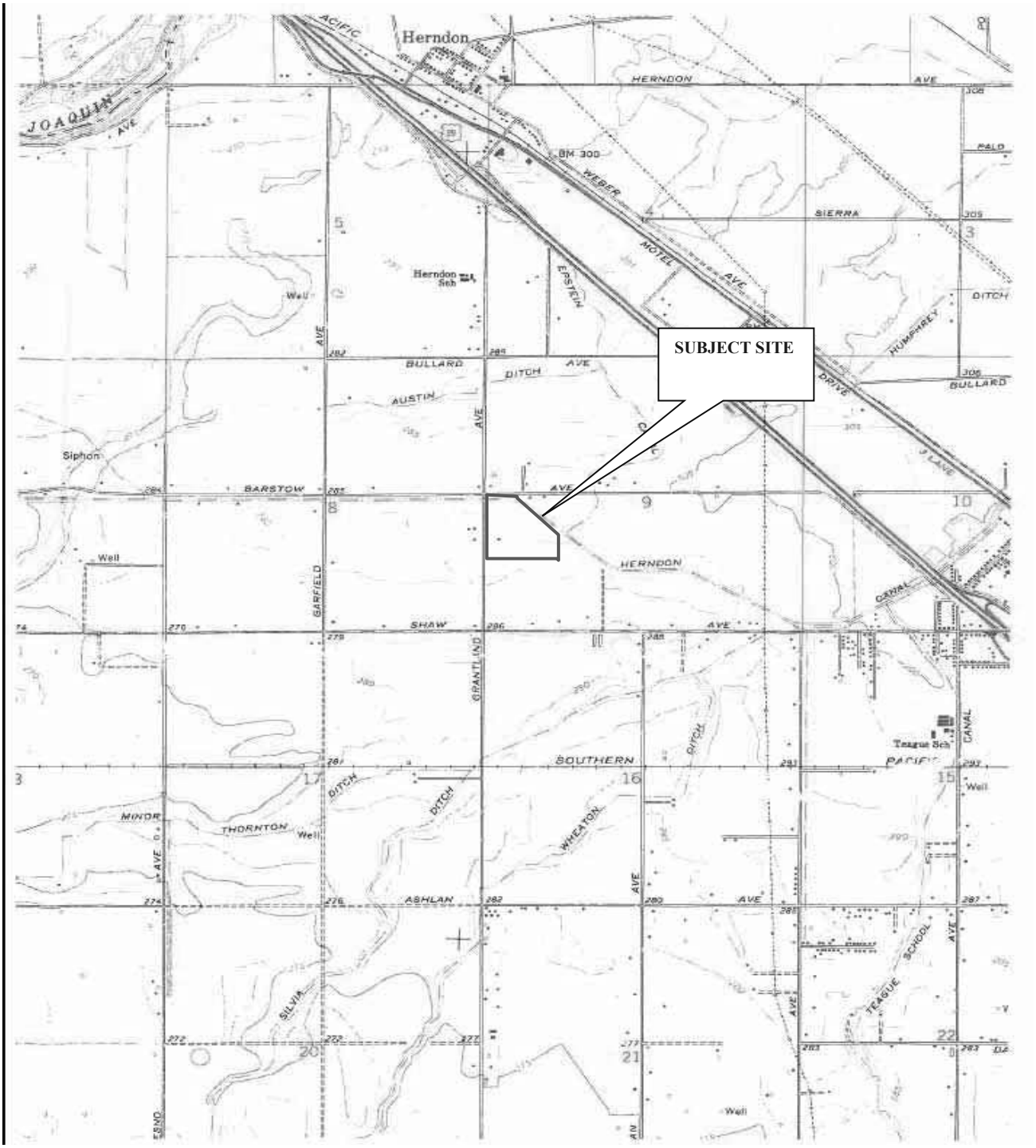


PARCEL MAP	**Scale:** NTS	**Date:** November 2019	Krazan
PROPOSED RESIDENTIAL DEVELOPMENT PROPERTY **5326 N GRANTLAND AVENUE** **FRESNO, CA**	**Drawn By:** MB	**Approved by:** MB	**SITE DEVELOPMENT ENGINEERS** ***With Offices Serving the Western United States***
	Project No. 014-19193	**Figure No.** 2	



= SUBJECT SITE BOUNDARY
= FORMER WATER WELL
= SOIL PILE
= FORMER RESIDENTIAL AND FARM BUILDINGS

SITE MAP	**Scale:** NTS	**Date:** November 2019	Krazan
PROPOSED RESIDENTIAL DEVELOPMENT PROPERTY 5326 N GRANTLAND AVENUE FRESNO, CA	**Drawn By:** MB	**Approved by:** MB	**SITE DEVELOPMENT ENGINEERS** *With Offices Serving the Western United States*
	Project No. 014-19193	**Figure No.** 3	



7.5-MINUTE SERIES
USGS TOPOGRAPHIC MAP
HERNDON, CALIFORNIA
DATED 1964
PHOTOREVISED 1978

TOPOGRAPHIC MAP	**Scale:** NTS	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** *With Offices Serving the Western United States*
PROPOSED RESIDENTIAL DEVELOPMENT PROPERTY 5326 N GRANTLAND AVENUE FRESNO, CA	**Drawn By:** MB	**Approved by:** MB	
	Project No. 014-19193	**Figure No.** 4	



Photo 1: Northeast-facing view of the subject site from the southwest corner showing a graded area and former orchard land in background.



Photo 2: East-facing view of the subject site along the southern property boundary with south adjoining property, residential, to right.



Photo 3: South-facing view of west property boundary with N. Grantland Avenue to right.



Photo 4: Southeast-facing view of the subject site from the northwest corner showing remnants of former orchard trees.



Photo 5: East/Southeast-facing view of subject site property boundary with Herndon Canal to left.



Photo 6: South-facing view of eastern property boundary with Herndon Canal to left.



Photo 7: West-facing view of subject site from eastern property boundary showing former orchard trees.



Photo 8: West-facing view of southern property boundary.



Photo 9: North-facing view of two (2) valve boxes with sewer inlet in between located on west side of subject site along N. Grantland Avenue.



Photo 10: Soil pile located and debris (washing machine, trash, etc.) along east property boundary near intersection of Herndon Canal and Epstein Canal.



Photo 11: Former water well, power pole, valve box and debris (bedding, trash, etc.) located just south of intersection of the Herndon and Epstein Canals along the east property boundary (Note: series of valve boxes that extend from eastern to western property boundaries).



Photo 12: Power pole for valve boxes located abound 500 feet from N. Grantland Avenue.



Photo 13: Southwest-facing view of trash/debris located near south property boundary near Herndon Canal. .



Photo 14: East-facing view of trash area located along south property boundary mid-way between Herndon Canal and N. Grantland Avenue.



Photo 15: North-facing view of north adjoining residential property across Herndon Canal and Barstow Avenue.



Photo 16: South-facing view of south adjoining residential property.



Photo 17: East-facing view of mostly vacant land showing intersection of Epstein Canal and Herndon Canal in foreground.



Photo 18: West-facing view of west adjoin residential property across N. Grantland Avenue.

Appendix A

NORTH AMERICAN TITLE COMPANY
Like Clockwork®

6612 Owens Drive, Suite 100
Pleasanton, California 94588
Office Phone: (925)847-9570
Office Fax: (925)847-0663

Escrow Officer Email: ebowens@nat.com

North American Title Company, Inc.
6612 Owens Drive, Suite 100
Pleasanton, CA 94588

Our Order No.: 1664776

Property Address: 5326 N. Grantland Ave
Fresno, CA 93723

Attention: Evelyn Bowens-Chambers

Preliminary Report Dated as of September 11, 2019 at 7:30 A.M.

In response to the above referenced application for a Policy of Title Insurance,

North American Title Insurance Company

Hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an Exception below or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage and limitations on covered risks of said Policy or Policies are set forth in Exhibit A attached. The Policy to be issued may contain an Arbitration Clause. When the amount of insurance is less than that set forth in the Arbitration Clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the Parties. Limitations on covered risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a deductible amount and a maximum dollar limit of liability for certain coverages are also set forth in Exhibit A. Copies of the Policy forms should be read. They are available from the office which issued this report.

Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

The form of Policy of title insurance contemplated by this report is: CLTA Standard Coverage Owners Policy

Please note that the America First Homeowner's Policy (CLTA/ ALTA Homeowner's Policy) can only be issued on transactions involving individuals as purchasers and residential 1-4 properties. Any indication that the America First Homeowner's Policy (CLTA/ ALTA Homeowner's Policy) will be issued in a transaction that does not meet these criteria is hereby revised to state that the policy contemplated is a Standard Coverage Policy.

Brian O'Connell, Title Officer

SCHEDULE A

1. The estate or interest in the land hereinafter described or referred to covered by this report is:

   Fee simple.

2. Title to said estate or interest at the date hereof is vested in:

   NORTHWEST FRESNANS INVESTMENT GROUP, A GENERAL PARTNERSHIP

3. The Land referred to in this report is situated in the City of Fresno State of California, County of Fresno, and is described as follows:

See attached Legal Description

LEGAL DESCRIPTION

Real property in the City of Fresno, County of Fresno, State of California, described as follows:

THAT PORTION OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 13 SOUTH, RANGE 19 EAST, MOUNT DIABLO BASE AND MERIDIAN, ACCORDING TO THE OFFICIAL PLAT THEREOF, LYING SOUTHWEST OF THE HERNDON CANAL.

APN: **505-060-07**

SCHEDULE B

At the date hereof exceptions to coverage in addition to the printed exceptions and exclusions in the policy form designated on the face page of this report would be as follows:

1. General and special taxes and assessments for the fiscal year 2019-2020, a lien not yet due or payable.

2. Taxes for proration purposes only for the fiscal year 2018-2019.

First Installment:	$6,602.25, PAID
Second Installment:	$6,602.25, PAID
Tax Rate Area:	005-826
APN:	505-060-07

3. The lien of supplemental taxes, if any, assessed pursuant to Chapter 3.5 commencing with Section 75 of the California Revenue and Taxation Code.

4. Water rights, claims or title to water, whether or not shown by the public records.

5. The fact that said property lies within the boundaries of Fresno Metropolitan Flood Control District and may be assessed for drainage fees and/or requirements to construct planned local drainage facilities as disclosed by FMFCD Resolution No. 1816, recorded July 31, 1995 as Instrument No. 95092128 of official records. There is no assessment due at this time.

6. Right of way for the Herndon Canal along the Northerly boundary of said property.

7. Rights of the public in and to that portion of the Land lying within North Grantland Avenue.

8. An unrecorded right of way for that certain ditch called the West Acres No. 531 Ditch, as disclosed by that certain expired lease in favor of Fresno Irrigation District recorded June 23, 1951 in Book 3034, Page 149 of Official Records as Document No. 35981.

   The route of said ditch is as follows:

   Beginning at a point 900 feet South and 1410 feet East of the West quarter corner of Section 9-13/19, in the Southwest bank of the Herndon Canal; thence West 1450 feet to the West line of said Section 9.

9. An easement for pipes, pipelines and conduits and to flow and conduct water through said pipes, pipelines and conduits, together with the right of ingress and egress and incidental purposes, recorded October 8, 1954 as Instrument No. 62199 in Book 3503, Page 552 of Official Records.

   In Favor of: Fresno Irrigation District
   Affects: A right of way and easement as described in the right of way hereinabove shown as Exception No. 1 above

10. An easement to install, construct, operate, maintain, repair, remove and replace an underground storm drainage pipeline and to conduct water through the same and incidental purposes, recorded March 9, 2009 as Instrument No. 2009-0031955 of Official Records.

    In Favor of: Fresno Metropolitan Flood Control District, a public corporation
    Affects: As described therein

11. An easement for public street purposes and incidental purposes, recorded August 12, 2016 as Instrument No. 2016-0106009 of Official Records.
In Favor of: The City of Fresno, a Municipal Corporation
Affects: The Southwesterly portion

12. With respect to Northwest Fresnans Investment Group, a general partnership:
a. That a certified copy of a statement of partnership authority pursuant to Section 16303 of the California Corporations Code (form GP-1), executed by at least two partners, and a certified copy of any amendments to such statement (form GP-7), be recorded in the public records;
b. A full copy of the partnership agreement and any amendments;
c. Other requirements which the Company may impose following its review of the material required herein and other information which the Company may require.

13. We find no open deeds of trust, and will require the Open Loans Affidavit form to be submitted for review prior to close.

14. Any claim that the title is subject to a trust or lien created under the Perishable Agricultural Commodities Act (7 U.S.C. §§ 499A, et seq.), The Packers and Stockyards Act (7 U.S.C. §§ 181, et seq.) or under similar federal or state laws.

15. Unrecorded matters which may be disclosed by an Owner's Affidavit or Declaration. A form of the Owner's Affidavit/Declaration is attached to this Preliminary Report/Commitment. This Affidavit/Declaration is to be completed by the record owner of the land and submitted for review prior to the closing of this transaction. Your prompt attention to this requirement will help avoid delays in the closing of this transaction. Thank you.

The Company reserves the right to add additional items or make further requirements after review of the requested Affidavit/Declaration.

********** END OF REPORT **********

***** NOTES *****

1. NOTICE OF RECORDING PROCEDURE

   Pursuant to Cal. Revenue & Tax Code §480.3, all Deeds and other Documents that reflect a change in ownership must be accompanied by a Preliminary Change of Ownership Report to be completed by the transferee. If this special report is not presented at the time of recording, an additional recording fee of $20.00, as required by law, will be charged. Preliminary Change in Ownership forms, instructions on how to complete them, and a nonexclusive list of documents that are affected by this change, are available from the County Recorder's Office or the Office of the County Assessor.

   Effective January 1, 2018, Cal. Government Code §27388.1 imposes an additional fee of $75.00 to be paid at the time of recording for every real estate instrument, paper, or notice required or permitted by law to record, except those expressly exempted from payment.

2. GOOD FUNDS LAW

   Under Section 12413.1 of the California Insurance Code, North American Title Company, Inc. may only make funds available for disbursement in accordance with the following rules:

   Same day availability. Disbursement on the date of deposit is allowed only when funds are deposited to North American Title Company, Inc. by Cash or Electronic Transfer (Wire). Cash will be accepted only under special circumstances and upon approval by management.

   Next business day availability. If funds are deposited toNorth American Title Company, Inc. by cashier's checks, certified checks or teller's checks, disbursement may be on the next business day following deposit. A "teller's check" is one drawn by an insured financial institution against another insured financial institution (e.g., a savings and loan funding with a check drawn against a FDIC insured bank).

   Second business day availability. If the deposit is made by checks other than those described in paragraphs 1 and 2 above, disbursement may occur on the day when funds must be made available to depositors under Federal Reserve Regulation CC. In most cases, these checks will be available on the second business day following deposit. (For further details, consult California Insurance Code Section 12413, et seq. and Regulation CC).

   These are the minimum periods before funds will be made available. North American Title Company, Inc. is not obligated to disburse funds at the expiration of the time periods above, and expressly reserves the right to require additional time before disbursing on deposited funds. Close of escrow and final disbursement will not be made based on deposits in the form of personal checks, corporate checks, credit union checks, money market checks, travelers checks and official checks until confirmation of final clearance of the funds.

   North American Title Company, Inc. will not be responsible for accruals of interest or other charges resulting from compliance with the disbursement restrictions imposed by state law.

3. North American Title Company, Inc.'s charges for recording the transaction documents include charges for services performed by North American Title Company, Inc., in addition to an estimate of payments to be made to governmental agencies.

4. Note: The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than the certain dollar amount set forth in any applicable arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the

parties. If you desire to review the terms of the policy, including any arbitration clause that may be included, contact the office that issued this Commitment or Report to obtain a sample of the policy jacket for the policy that is to be issued in connection with your transaction.

5. The map attached, if any, may or may not be a survey of the land depicted hereon. North American Title Company, Inc. expressly disclaims any liability for loss or damage which may result from reliance on this map except to the extent coverage for such loss or damage is expressly provided by the terms and provisions of the title insurance policy, if any, to which this map is attached.

OWNER'S DECLARATION

The undersigned Owner(s) of legal age, being duly sworn, deposes and states under penalty of perjury under the laws of the State of California.

1. That certain real property (the"Property") as described in that certain Commitment of Title Insurance/Preliminary Report No. 54606-1664776-19 dated as of September 11, 2019 ("Commitment/Report") issued by or on behalf of North American Title Company, Inc. ("North American Title Company, Inc.") is improved by the following (check all that apply)

☐	Single family residences	☐	One-to-four family residences
☐	Apartment building	☐	Office building
☐	Commercial building	☐	Combination office/commercial building
☐	Industrial building	☐	Vacant Land
☐	Other: _____		

2. WORK OF IMPROVEMENT: Please respond to A, B and C below:

   A. For the period of 90-days prior to the date of this Affidavit, no repairs or work of improvement has been conducted on, nor any materials supplied to, the Property except as follows:

   _____

   _____

   _____

   (Enter "None" if such is true.)

   If you have described any work of improvement above, please complete the following:

   ☐ Started on _____, 20_____.
   ☐ Completed on _____, 20_____.
   ☐ Will be completed on _____, 20_____.

   B. Cessation of Labor (Please place an "X" by 1 or 2 below):

   ☐ 1. There has been a cessation of labor where a work of Improvement was discontinued before completion within 150 days of the date of this Affidavit.
   PLEASE DESCRIBE THE NATURE OF THE WORK THAT DISCONTINUED:

   _____

   _____

   _____

   ☐ 2. There has not been a cessation of labor where a work of improvement was discontinued before completion within 150 days of the date of this Affidavit.

C. There are no unpaid bills for labor or material because of any improvements made to the Property except:

_____

_____

_____

(Enter "None" if such is true.)

3. No one is in possession of, or has any right to possession of, the Property except:

   ☐ Declarant as owner.

   ☐ Tenants based only on month-to-month rental agreements.

   ☐ Tenants based upon existing leases as listed on the Rent Roll attached hereto as **Exhibit A** and incorporated herein by reference.

   ☐ Other:_____

4. No person(s) or entitles, have (i) any options to purchase or rights of first refusal, including but not limited to lessees under any leases referred to in Paragraph 3 above, and/or (ii) easements, licenses, agreements or other rights allowing them to use, encroach on, or access to the Property except (i) as shown in the Commitment/Report, and (ii)

   _____

   _____

   _____

   (Enter "None" if such is true.)

5. Those certain lease(s) shown as exception number(s) _____ in the Commitment/Report have either: (a) expired by their own terms, or (b) if they have not expired, the lessee(s) have vacated the Property and Declarant has been notified of the vacation of the Property either by correspondence from the lessee or by physical inspection of the property.

6. To the best of Declarant's knowledge, there are no unrecorded real property taxes or assessments against the Property.

   The undersigned is not aware of any release reports or commitment statements which have been issued pertaining to any environmental issues or liens.

7. This Affidavit is given for the purpose of inducing North American Title Company, Inc. and its agents to issue policy(ies) of title insurance which may provide coverage with respect to all matters set forth herein. If North American Title Company, Inc. elects, in its discretion, to (a) accept this Affidavit, and (b) issue title insurance policy(ies) to third parties, North American Title Company, Inc. will do so in material reliance on this Affidavit and the representation and covenants in this Affidavit.

8. Declarant acknowledges that he/she has read this Affidavit, that all the statements made in this Affidavit are true and correct of his/her own actual knowledge, and fully understands the legal aspects of any misrepresentations or untrue statements made in this Affidavit. Declarant, both personally and on behalf of Owner, covenants and agrees to defend, indemnify, and hold North American Title Company, Inc. harmless from and against any and all claims, actions, suits (including arbitration), liabilities, losses, damages, costs, charges, attorney's fees and other expenses of every nature and character as a result of its reliance on this Affidavit.

Executed on _____, 20_____, at _____, _____
(City) (State)

"Declarant"

_____
Owner

_____
Owner

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of _____

County of _____

Subscribed and sworn to (or affirmed) before me on this _____ day of _____, 20____, by _____, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

(seal) Signature _____

OPEN LOANS AFFIDAVIT

Order Number: 54606-1664776-19 **Escrow Number: 54606-1664776-19**

_____ of legal age, hereby declares and swears, under penalty of perjury that the following information, declarations, representations and answers are true, correct and complete:

1. I am the current owner of the property in this transaction which has an address of:
   5326 N. Grantland Ave, Fresno, CA 93723

2. That the following is a complete and comprehensive list of all open loans taken out against said land:
   (If no open loans, please write NONE on the 1st Current Lender Line and initial).

1.) Current Lender: _____ Loan Balance $_____

Original Lender: _____ Original Loan Amount: $_____

Are you in default of this Loan: ☐ YES ☐ NO IF YES, how long (___) MONTHS

2.) Current Lender: _____ Loan Balance $_____

Original Lender: _____ Original Loan Amount: $_____

Are you in default of this Loan: ☐ YES ☐ NO IF YES, how long (___) MONTHS

3.) Current Lender: _____ Loan Balance $_____

Original Lender: _____ Original Loan Amount: $_____

Are you in default of this Loan: ☐ YES ☐ NO IF YES, how long (___) MONTHS

4.) Current Lender: _____ Loan Balance $_____

Original Lender: _____ Original Loan Amount: $_____

Are you in default of this Loan: ☐ YES ☐ NO IF YES, how long (___) MONTHS

3. I understand and acknowledge that this Affidavit is made for the protection and benefit of North American Title Company, Inc. and for all other parties hereafter dealing with or who may acquire an interest in said Property and for the purpose of inducing North American Title Company, Inc. (including its affiliates and underwriters) to insure title to said Property. I am fully aware and know that North American Title Company, Inc. will rely on this Affidavit and would not insure title without it. We also hereby agree to indemnify and hold North American Title Company, Inc. harmless and to become fully financially responsible for any loss that may occur to North American Title Company, Inc. or any other parties if any of the information, declarations, representations and answers turn out to not be true, correct and/or complete, whether by accidental omission or actual deceit and/or fraud.

Dated: _____

BY: _____ **BY:** _____

NORTH AMERICAN TITLE COMPANY, INC.

6612 Owens Drive, Suite 100, Pleasanton, CA 94588
(925)847-9570 Fax: (925)847-0663 Email: nocal.pleasantonstoneridge@nat.com

Closing Protection Letters can be ordered directly by emailing cacpl@nat.com with your title order number and property address.

Attention:

Your Ref:
Our Order No.: 54606-1664776-19

LENDERS SUPPLEMENTAL REPORT

Dated as of September 11, 2019 AT 7:30 A.M.

Title Officer: Brian O'Connell

The above numbered report (including any supplements or amendments thereto) is hereby modified and/or supplemented in order to reflect the following additional items relating to the issuance of an American Land Title Association loan form policy of Title Insurance:

Our ALTA Loan Policy, when issued, will contain Endorsement Nos. 100 and 116.

There is located on said land a Commercial
Known as: 5326 N. Grantland Ave
City of Fresno
County of Fresno
State of California.

According to the public records, there has been no conveyance of the land within a period of twenty-four months prior to the date of this report, except as follows:

None

Privacy Policy

Rev. 01/07/2019

The States Title Family of Companies

FACTS	WHAT DOES THE STATES TITLE FAMILY OF COMPANIES DO WITH YOUR PERSONAL INFORMATION?
Why?	Financial companies choose how they share your personal information. Federal law gives consumers the right to limit some, but not all, sharing. Federal law also requires us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand what we do.
What?	The types of personal information we collect and share depend on the product or service you have with us. This information can include: • Social Security number and income • Transaction history and payment history • Purchase history and account balances
How?	All financial companies need to share customers' personal information to run their everyday business. In the section below, we list the reasons financial companies can share their customers' personal information, the reasons the States Title Family of Companies ("ST") chooses to share, and whether you can limit this sharing.

Reasons we can share your personal information	Does ST share?	Can you limit this sharing?
For our everyday business purposes Such as to process your transactions, maintain your account(s), respond to court orders and legal investigations, or report to credit bureaus	Yes	No
For our marketing purposes To offer our products and services to you	Yes	No
For joint marketing with other financial companies	No	We don't share
For our affiliates' everyday business purposes Information about your transactions and experiences	Yes	No
For our affiliates' everyday business purposes Information about your creditworthiness	No	We don't share
For our affiliates to market to you	No	We don't share
For nonaffiliates to market to you	No	We don't share

Questions?	Call 1 (650) 419-3827

Page 2

Who we are	
Who is providing this notice?	The States Title Family of Companies (identified below), which offers title insurance and settlement services.
What we do	
How does ST protect my personal information?	To protect your personal information from unauthorized access and use, we use security measures that comply with federal law. These measures include computer safeguards and secure files and buildings.
How does ST collect my personal information?	We collect your personal information, for example, when you • Apply for insurance; • Apply for financing; • Give us your contact information • Provide your mortgage information • Show your government-issued ID We also collect your personal information from others, such as credit bureaus, affiliates, or other companies.
Why can't I limit all sharing?	Federal law gives you the right to limit only • **Sharing for affiliates' everyday business purposes –** information about your creditworthiness • Affiliates from using your information to market to you • Sharing for nonaffiliates to market to you State laws and individual companies may give you additional rights to limit sharing.
What happens when I limit sharing for an account I hold jointly with someone else?	Your choices will apply to everyone on your account – unless you tell us otherwise.
Definitions	
Affiliates	Companies related by common ownership or control. They can be financial and nonfinancial companies.
Nonaffiliates	Companies not related by common ownership or control. They can be financial and nonfinancial companies. • Nonaffiliates we share with can include collection agencies, IT service providers, companies that perform marketing services on our behalf, and consumer reporting agencies.
Joint marketing	A formal agreement between nonaffiliated financial companies that together market financial products or services to you. • ST doesn't jointly market.

The States Title Family of Companies consists of the following entities:

States Title Holding Inc.
States Title, Inc.
States Title Insurance Company
States Title Insurance Company of California
States Title Agency, Inc.
Spear Agency Acquisition Inc.
Title Agency Holdco, LLC
North American Title Company
North American Title Company, Inc.
North American Title Company of Colorado
North American Title Insurance Company
North American Services, LLC
North American Title Agency, Inc.
North American Title, LLC
North American Title Company, LLC
NASSA LLC
North American Asset Development, LLC

CLTA STANDARD COVERAGE POLICY - 1990

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building or zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien, or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
   (a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
   (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   (c) resulting in no loss or damage to the insured claimant;
   (d) attaching or created subsequent to Date of Policy; or
   (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated.
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any claim, which arises out of the transaction vesting in the insured the estate of interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

EXCEPTIONS FROM COVERAGE - SCHEDULE B, PART I

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
   Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.
6. Any lien or right to a lien for services, labor or material not shown by the public records.

CLTA/ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (12-02-13)

EXCLUSIONS

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of those portions of any law or government regulation concerning:
   a. building;
   b. zoning;
   c. land use;
   d. improvements on the Land;
   e. land division; and
   f. environmental protection.
   This Exclusion does not limit the coverage described in Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23 or 27.
2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not limit the coverage described in Covered Risk 14 or 15.
3. The right to take the Land by condemning it. This Exclusion does not limit the coverage described in Covered Risk 17.
4. Risks:
   a. that are created, allowed, or agreed to by You, whether or not they are recorded in the Public Records;
   b. that are Known to You at the Policy Date, but not to Us, unless they are recorded in the Public Records at the Policy Date;
   c. that result in no loss to You; or
   d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.e., 25, 26, 27 or 28.
5. Failure to pay value for Your Title.
6. Lack of a right:
   a. to any land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
   b. in streets, alleys, or waterways that touch the Land.
   This Exclusion does not limit the coverage described in Covered Risk 11 or 21.
7. The transfer of the Title to You is invalid as a preferential transfer or as a fraudulent transfer or conveyance under federal bankruptcy, state insolvency, or similar creditors' rights laws.
8. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
9. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

LIMITATIONS ON COVERED RISKS

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:

- For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A.

The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount		Our Maximum Dollar Limit of Liability
Covered Risk 16:	1% of Policy Amount Shown in Schedule A or (whichever is less)	$2,500	$10,000
Covered Risk 18:	1% of Policy Amount Shown in Schedule A or (whichever is less)	$5,000	$25,000
Covered Risk 19:	1% of Policy Amount Shown in Schedule A or (whichever is less)	$5,000	$25,000
Covered Risk 21:	1% of Policy Amount Shown in Schedule A or (whichever is less)	$2,500	$5,000

2006 ALTA LOAN POLICY (06-17-06)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

[Except as provided in Schedule B - Part II,[t[or T]his policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:

[PART I

[The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material not shown by the Public Records.]

PART II

In addition to the matters set forth in Part I of this Schedule, the Title is subject to the following matters, and the Company insures against loss or damage sustained in the event that they are not subordinate to the lien of the Insured Mortgage:]

2006 ALTA OWNER'S POLICY (06-17-06)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.

(b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

1. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
2. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
3. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
4. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:
[The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown in the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and that are not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material not shown by the Public Records.
7. [Variable exceptions such as taxes, easements, CC&R's, etc. shown here.]

ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY - ASSESSMENTS PRIORITY (04-02-15)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

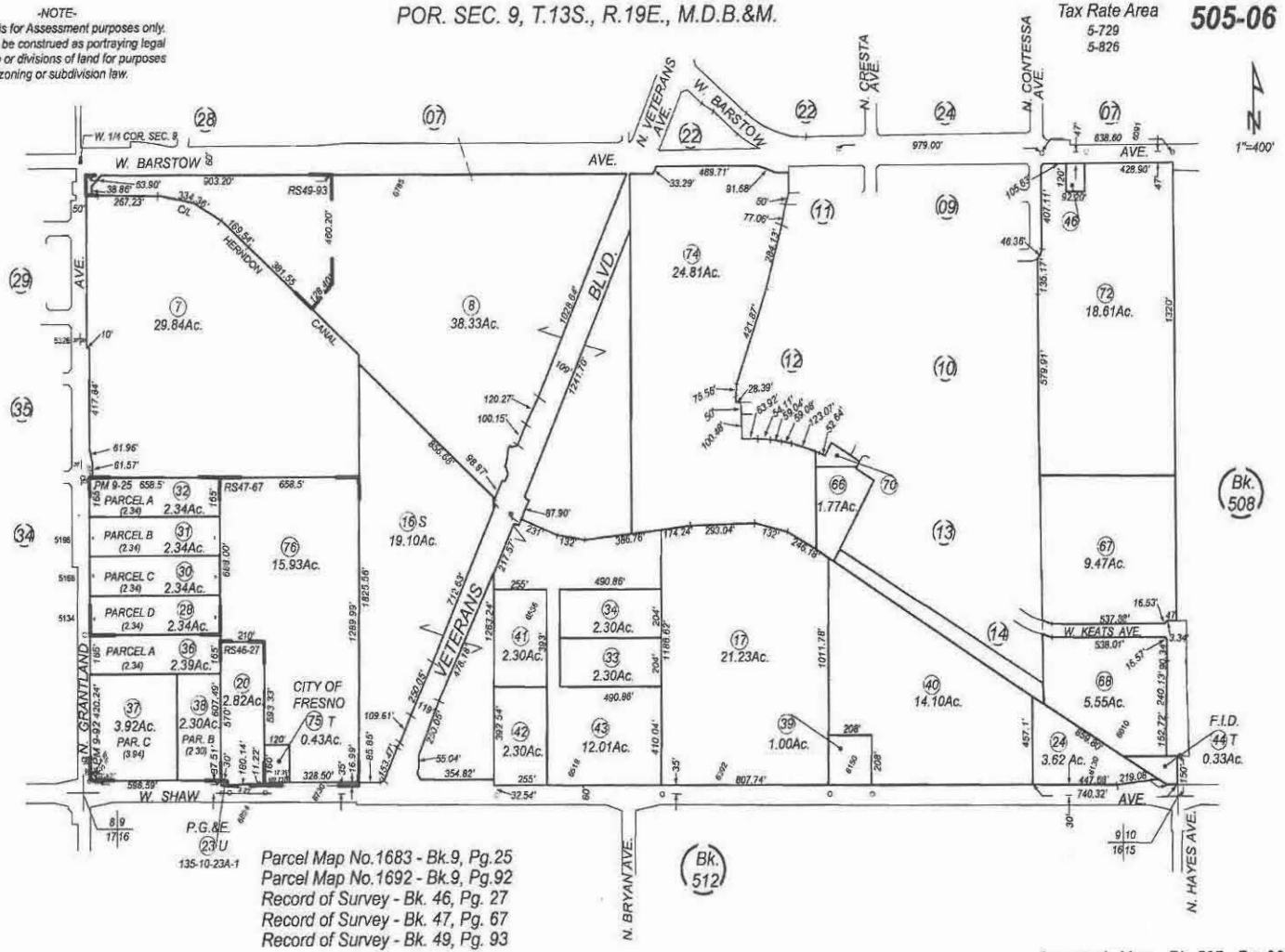
1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 or 28); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, or any consumer credit protection or truth-in-lending law. This Exclusion does not modify or limit the coverage provided in Covered Risk 26.
6. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to Advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching subsequent to Date of Policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11(b) or 25.
8. The failure of the residential structure, or any portion of it, to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This Exclusion does not modify or limit the coverage provided in Covered Risk 5 or 6.
9. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 27(b) of this policy.
10. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
11. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

-NOTE-
This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.

POR. SEC. 9, T.13S., R.19E., M.D.B.&M.

Tax Rate Area
5-729
5-826

505-06



Parcel Map No.1683 - Bk.9, Pg.25
Parcel Map No.1692 - Bk.9, Pg.92
Record of Survey - Bk. 46, Pg. 27
Record of Survey - Bk. 47, Pg. 67
Record of Survey - Bk. 49, Pg. 93

Assessor's Map Bk. 505 - Pg. 06
County of Fresno, Calif.

Note - Assessor's Block Numbers Shown in Ellipses
Assessor's Parcel Numbers Shown in Circles

11/14/2018

Appendix B

Phase I ESA User Questionnaire
Proposed Residential Development
5326 N. Grantland Avenue
Fresno, California 93723

Respondent Information:

Name: Ms. Wendy Erickson
Organization: Lennar Homes of California
Date: November 4th, 2019
Phone: 559 437 4279

Introduction

"In order to qualify for one of the *Landowner Liability Protections (LLPs)* offered by the Small Business Liability Relief and Brownfield Revitalization Act of 2001 (the 'Brownfields Amendments'), the user must provide the following information (if available) to the environmental professional. Failure to provide this information could result in a determination that 'all appropriate inquiry' is not completed"- American Society for Testing and Materials (ASTM) E1527-13 Appendix X3: User Questionnaire

1. Are you aware of any environmental cleanup liens against the subject site that are filed or recorded under federal, tribal, state, or local law?

I am not aware of any environmental cleanup liens against the subject site that are filed or recorded under federal, tribal or local law.

2. Are you aware of any activity use limitations (AULs) such as engineering controls, land use restrictions, or institutional controls that are in place at the subject site and/or have been filed or recorded in a registry under federal, tribal, state, or local law?

I am not aware of any activity use limitations filed or recorded on the property.

3. As the user of the Phase I Environmental Site Assessment (ESA), do you have any specialized knowledge or experience related to the subject site or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the subject site or an adjacent property so that you would have specialized knowledge of the chemicals and processes used by this type of business?

I do not have any specialized knowledge or experience related to the subject site or nearby property.

4. Does the purchase price being paid for the subject site reasonably reflect the fair market value of the subject site? Yes✓ No

   A. If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the subject site?

N/A

5. Are you aware of commonly known or reasonably ascertainable information about the subject site that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example:

A. Do you know the past uses of the subject site? If so, briefly explain.
I am aware that the subject site was previously used for agricultural purposes.

B. Do you know of specific chemicals that are present or once were present at the subject site?If so, briefly explain.
I am not aware of any specific chemicals that are present or once were present on the subject site.

C. Do you know of spills or other chemical releases that have taken place at the subject site? If so, briefly explain.
I am not aware of any spills or other chemical releases that have taken place at the subject site.

D. Do you know of any environmental cleanups that have taken place at the subject site? If so, briefly explain.
I am not aware of any environmental cleaups on the subject site.

6. As the user of the Phase I ESA, based on your knowledge and experience related to the subject site, are there any obvious indicators that point to the presence or likely presence of contamination at the subject site?
Based on my knowledge and experience related to the subject site. I have found no obvious indicators that point to the presence or likely presence of contamination at the subject site.

7. What is the reason for preparation of this Phase I ESA? (Property purchase/sale; bank loan; proposed development; etc.)
Property purchase.

I, the user of this Phase I ESA (or authorized representative of the User), do hereby attest that I have carefully considered the questions herein and have presented answers to the best of my knowledge and ability based upon the Responsibilities of the User as required within ASTM E1527-13 guidance.

Name Bill Walls (Please Print) Date November 4th, 2019

Signature 

Appendix C



1937 AERIAL PHOTOGRAPH

PROPOSED RESIDENTIAL DEVELOPMENT
5326 N. GRANTLAND AVENUE
APN 505-060-07
FRESNO, CALIFORNIA

Scale: 1" = 500'	**Date:** November 2019
Drawn By: MB	**Approved by:** MB
Project No. 014-19193	**Source:** USDA

Krazan

SITE DEVELOPMENT ENGINEERS
With Offices Serving the Western United States



1946 AERIAL PHOTOGRAPH	**Scale:** 1" = 500'	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** *With Offices Serving the Western United States*
PROPOSED RESIDENTIAL DEVELOPMENT **5326 N. GRANTLAND AVENUE** **APN 505-060-07** **FRESNO, CALIFORNIA**	**Drawn By:** MB	**Approved by:** MB	
	Project No. 014-19193	**Source:** USGS	



1957 AERIAL PHOTOGRAPH

PROPOSED RESIDENTIAL DEVELOPMENT
5326 N. GRANTLAND AVENUE
APN 505-060-07
FRESNO, CALIFORNIA

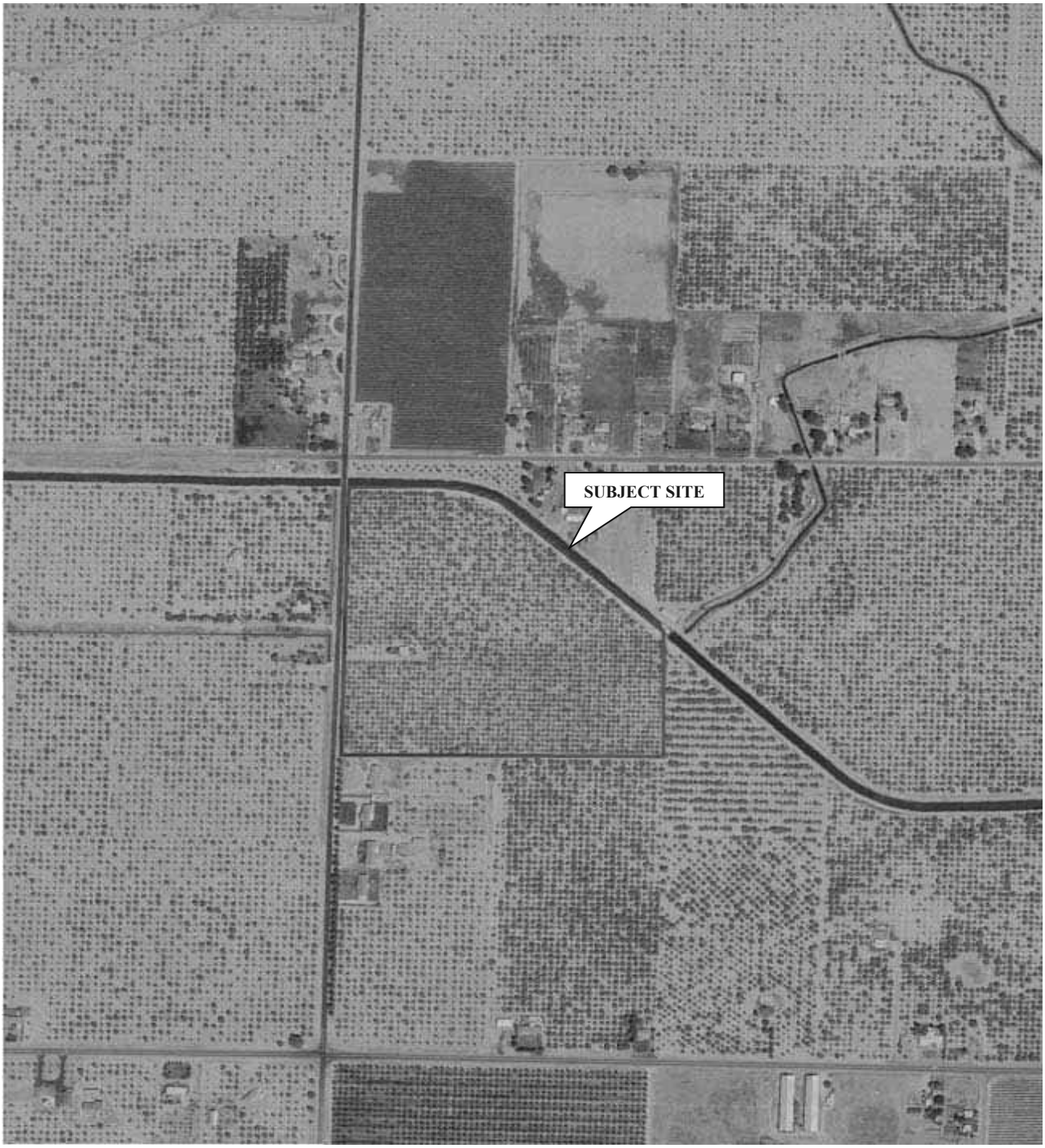
Scale: 1" = 500'	**Date:** November 2019
Drawn By: MB	**Approved by:** MB
Project No. 014-19193	**Source:** USDA

Krazan

SITE DEVELOPMENT ENGINEERS
With Offices Serving the Western United States



1967 AERIAL PHOTOGRAPH	**Scale:** 1" = 500'	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** *With Offices Serving the Western United States*
PROPOSED RESIDENTIAL DEVELOPMENT **5326 N. GRANTLAND AVENUE** **APN 505-060-07** **FRESNO, CALIFORNIA**	**Drawn By:** MB	**Approved by:** MB	
	Project No. 014-19193	**Source:** USDA	



1979 AERIAL PHOTOGRAPH **PROPOSED RESIDENTIAL DEVELOPMENT** **5326 N. GRANTLAND AVENUE** **APN 505-060-07** **FRESNO, CALIFORNIA**	**Scale:** 1" = 500'	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** ***With Offices Serving the Western United States***
	Drawn By: MB	**Approved by:** MB	
	Project No. 014-19193	**Source:** USDA	



1987 AERIAL PHOTOGRAPH

PROPOSED RESIDENTIAL DEVELOPMENT
5326 N. GRANTLAND AVENUE
APN 505-060-07
FRESNO, CALIFORNIA

Scale: 1" = 500'	**Date:** November 2019
Drawn By: MB	**Approved by:** MB
Project No. 014-19193	**Source:** USDA

Krazan

SITE DEVELOPMENT ENGINEERS
With Offices Serving the Western United States



1998 AERIAL PHOTOGRAPH

PROPOSED RESIDENTIAL DEVELOPMENT
5326 N. GRANTLAND AVENUE
APN 505-060-07
FRESNO, CALIFORNIA

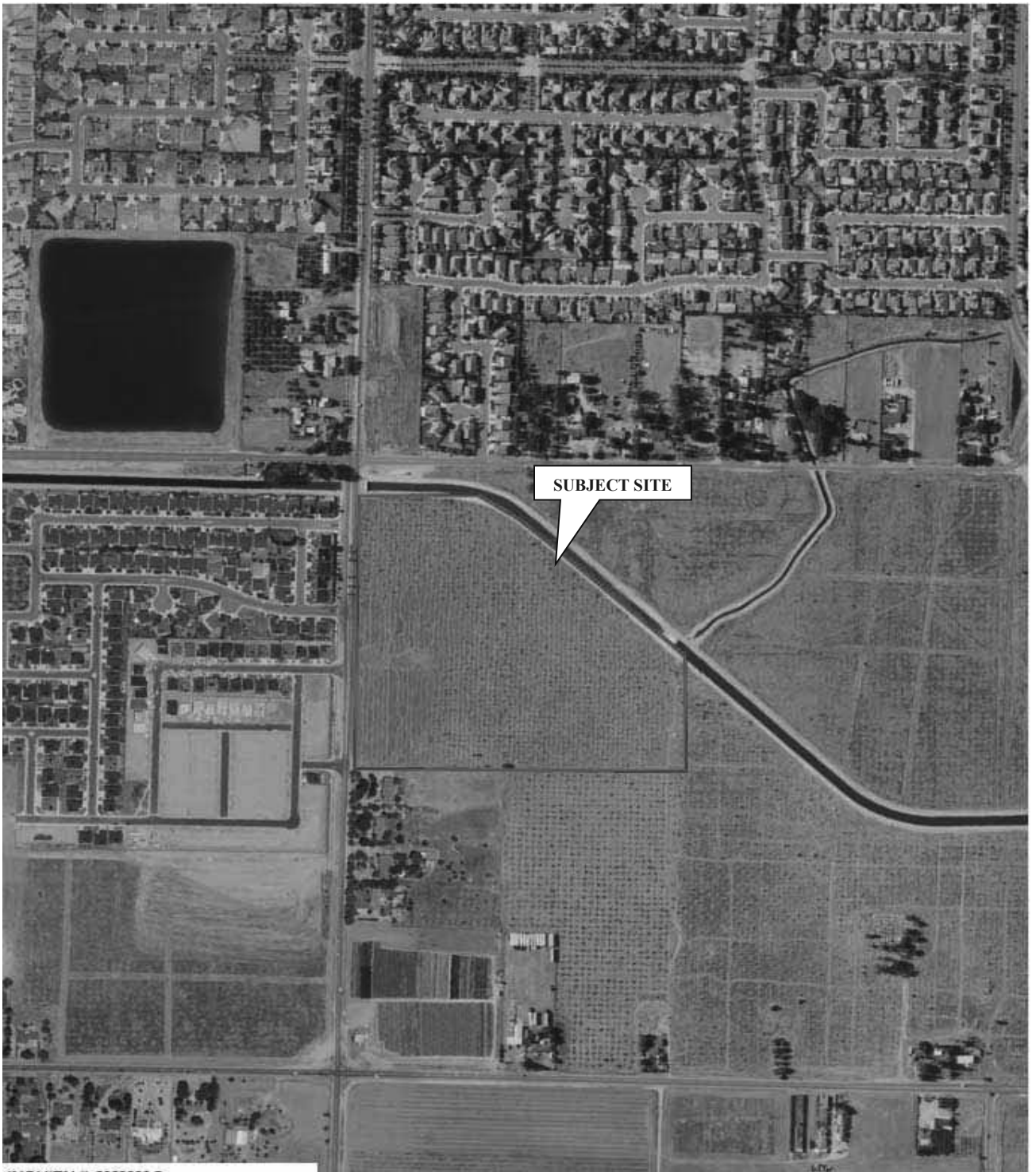
Scale: 1" = 500'	**Date:** November 2019
Drawn By: MB	**Approved by:** MB
Project No. 014-19193	**Source:** USGS/DOQQ

Krazan

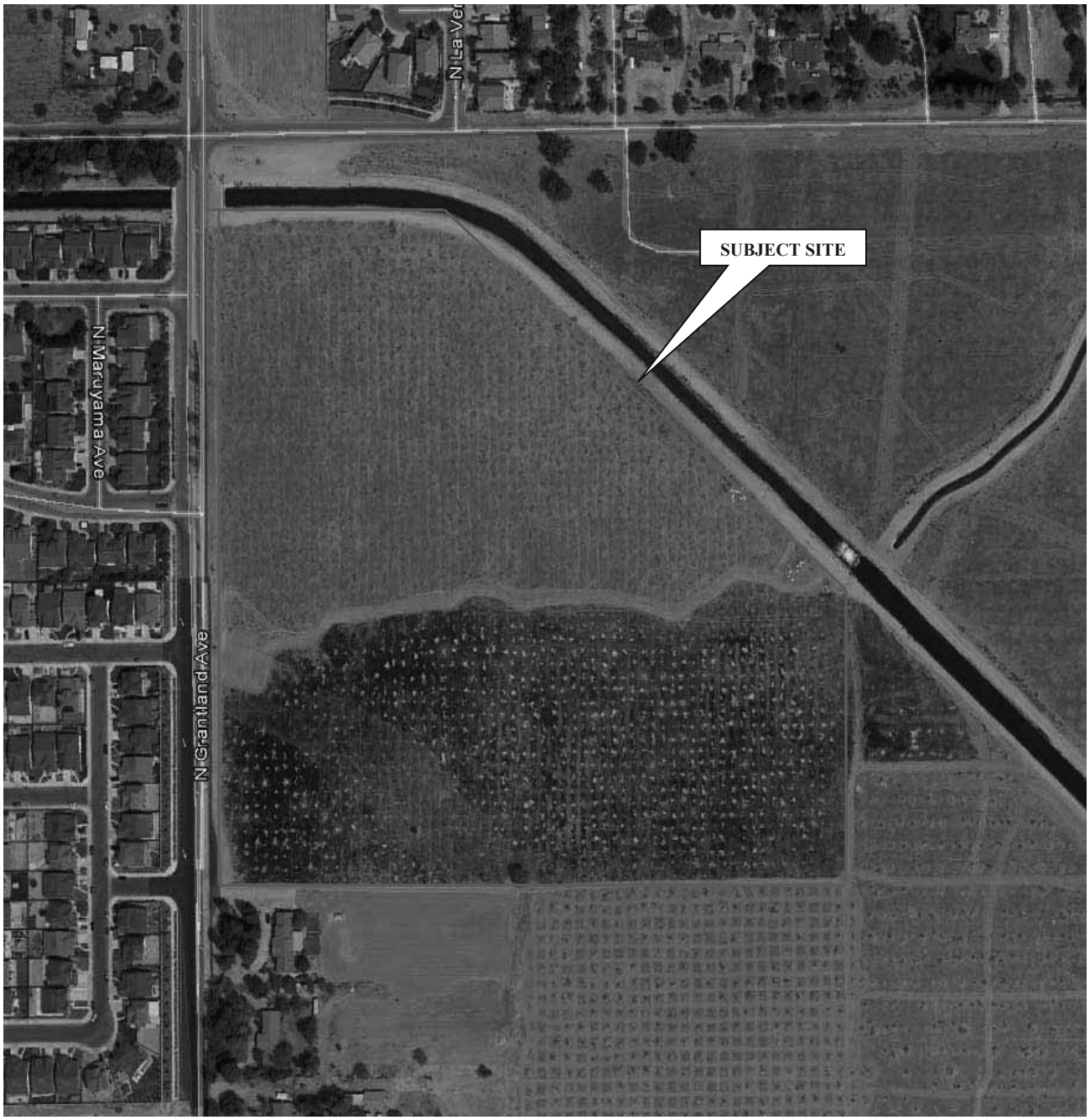
SITE DEVELOPMENT ENGINEERS
With Offices Serving the Western United States



2009 AERIAL PHOTOGRAPH **PROPOSED RESIDENTIAL DEVELOPMENT** **5326 N. GRANTLAND AVENUE** **APN 505-060-07** **FRESNO, CALIFORNIA**	**Scale:** 1" = 500'	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** ***With Offices Serving the Western United States***
	Drawn By: MB	**Approved by:** MB	
	Project No. 014-19193	**Source:** USDA/NAIP	



2016 AERIAL PHOTOGRAPH **PROPOSED RESIDENTIAL DEVELOPMENT** **5326 N. GRANTLAND AVENUE** **APN 505-060-07** **FRESNO, CALIFORNIA**	**Scale:** 1" = 500'	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** ***With Offices Serving the Western United States***
	Drawn By: MB	**Approved by:** MB	
	Project No. 014-19193	**Source:** USDA/NAIP	



2018 AERIAL PHOTOGRAPH **PROPOSED RESIDENTIAL DEVELOPMENT** **5326 N. GRANTLAND AVENUE** **APN 505-060-07** **FRESNO, CALIFORNIA**	**Scale:** NTS	**Date:** November 2019	Krazan **SITE DEVELOPMENT ENGINEERS** ***With Offices Serving the Western United States***
	Drawn By: MB	**Approved by:** MB	
	Project No. 014-19193	**Source:** Google Earth	

Appendix D

Proposed Residential Development – Lennar

5326 N. Grantland Avenue

Fresno, CA 93723

Inquiry Number: 5851032.3

October 31, 2019

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

10/31/19

Site Name:

Proposed Residential Developr
5326 N. Grantland Avenue
Fresno, CA 93723
EDR Inquiry # 5851032.3

Client Name:

Krazan & Associates, Inc.
215 West Dakota
Clovis, CA 93612
Contact: Michael Bowery

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Krazan & Associates, Inc. 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:

Certification # 7DF7-40DA-9336

PO # 014-19192

Project POM Wonderful

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 #: 7DF7-40DA-9336

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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Appendix E

Proposed Residential Development - Lennar
5326 N. Grantland Avenue
Fresno, CA 93723

Inquiry Number: 5852828.2s
October 31, 2019

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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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), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

5326 N. GRANTLAND AVENUE
FRESNO, CA 93723

COORDINATES

Latitude (North):	36.8129650 - 36° 48' 46.67''
Longitude (West):	119.9144640 - 119° 54' 52.07''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	240010.5
UTM Y (Meters):	4077885.8
Elevation:	296 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5603182 HERNDON, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140619
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
5326 N. GRANTLAND AVENUE
FRESNO, CA 93723

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	H.B. BUCK RANCHES	6825 W BARSTOW	SWEEPS UST, CA FID UST, CUPA Listings	Lower	456, 0.086, NE
A2	H.B. BUCK RANCHES	6825 W BARSTOW AVE	HIST UST	Lower	456, 0.086, NE
3	SAL'S WELDING & FABR	6636 W BARSTOW	CUPA Listings	Higher	882, 0.167, NE
4	MID VALLEY EQUIPMENT	6101 N GOLDEN STATE	ENVIROSTOR, CUPA Listings	Higher	5154, 0.976, NE
5	GOLDEN STATE RANCH P	ASHLAN AVENUE/GRANTL	ENVIROSTOR, SCH	Lower	5233, 0.991, South

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
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

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-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

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

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE..... State Response Sites

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
CPS-SLIC..... Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
UST..... Active UST Facilities
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
SWRCY..... Recycler 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
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register

HIST Cal-Sites ---- Historical Calsites Database
SCH ---- School Property Evaluation Program
CDL ---- Clandestine Drug Labs
CERS HAZ WASTE ---- CERS HAZ WASTE
Toxic Pits ---- Toxic Pits Cleanup Act Sites
US CDL ---- National Clandestine Laboratory Register
PFAS ---- PFAS Contamination Site Location Listing

Local Lists of Registered Storage Tanks

CERS TANKS ---- California Environmental Reporting System (CERS) Tanks

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
ABANDONED MINES ---- Abandoned Mines
FINDS ---- Facility Index System/Facility Registry System
ECHO ---- Enforcement & Compliance History Information
UXO ---- Unexploded Ordnance Sites
DOCKET HWC ---- Hazardous Waste Compliance Docket Listing
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
CA BOND EXP. PLAN ---- Bond Expenditure Plan
Cortese ---- "Cortese" Hazardous Waste & Substances Sites List
DRYCLEANERS ---- Cleaner Facilities
EMI ---- Emissions Inventory Data
ENF ---- Enforcement Action Listing
Financial Assurance ---- Financial Assurance Information Listing
HAZNET ---- Facility and Manifest Data
ICE ---- ICE
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
UIC GEO ---- UIC GEO (GEOTRACKER)
WASTEWATER PITS ---- Oil Wastewater Pits Listing
WDS ---- Waste Discharge System
WIP ---- Well Investigation Program Case List
MILITARY PRIV SITES ---- MILITARY PRIV SITES (GEOTRACKER)
PROJECT ---- PROJECT (GEOTRACKER)
WDR ---- Waste Discharge Requirements Listing
CIWQS ---- California Integrated Water Quality System
CERS ---- CERS
NON-CASE INFO ---- NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS ---- OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS ---- PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT ---- SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ ---- Well Stimulation Project (GEOTRACKER)
MINES MRDS ---- Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ---- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---- Recovered Government Archive Solid Waste Facilities List

EXECUTIVE SUMMARY

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.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

ENVIROSTOR: 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.

A review of the ENVIROSTOR list, as provided by EDR, and dated 07/29/2019 has revealed that there are 2 ENVIROSTOR sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MID VALLEY EQUIPMENT Status: Refer: 1248 Local Agency Facility Id: 60000578	***6101 N GOLDEN STATE***	***NE 1/2 - 1 (0.976 mi.)***	***4***	***10***

Lower Elevation	Address	Direction / Distance	Map ID	Page
GOLDEN STATE RANCH P Status: No Action Required Facility Id: 10010014	***ASHLAN AVENUE/GRANTL***	***S 1/2 - 1 (0.991 mi.)***	***5***	***11***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

EXECUTIVE SUMMARY

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.

Lower Elevation	Address	Direction / Distance	Map ID	Page
H.B. BUCK RANCHES	***6825 W BARSTOW***	***NE 0 - 1/8 (0.086 mi.)***	***A1***	***8***
Status: A Tank Status: A Comp Number: 35178				

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
H.B. BUCK RANCHES Facility Id: 00000035178	6825 W BARSTOW AVE	NE 0 - 1/8 (0.086 mi.)	A2	9

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.

Lower Elevation	Address	Direction / Distance	Map ID	Page
H.B. BUCK RANCHES	***6825 W BARSTOW***	***NE 0 - 1/8 (0.086 mi.)***	***A1***	***8***
Facility Id: 10006598 Status: A				

Other Ascertainable Records

CUPA Listings: 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.

A review of the CUPA Listings list, as provided by EDR, has revealed that there are 2 CUPA Listings sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SAL'S WELDING & FABR	6636 W BARSTOW	NE 1/8 - 1/4 (0.167 mi.)	3	9
Database: CUPA FRESNO, Date of Government Version: 07/11/2019 Facility Id: FA0271449				

Lower Elevation	Address	Direction / Distance	Map ID	Page
H.B. BUCK RANCHES	***6825 W BARSTOW***	***NE 0 - 1/8 (0.086 mi.)***	***A1***	***8***
Database: CUPA FRESNO, Date of Government Version: 07/11/2019				

EXECUTIVE SUMMARY

Facility Id: FA0276523

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 5852828.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

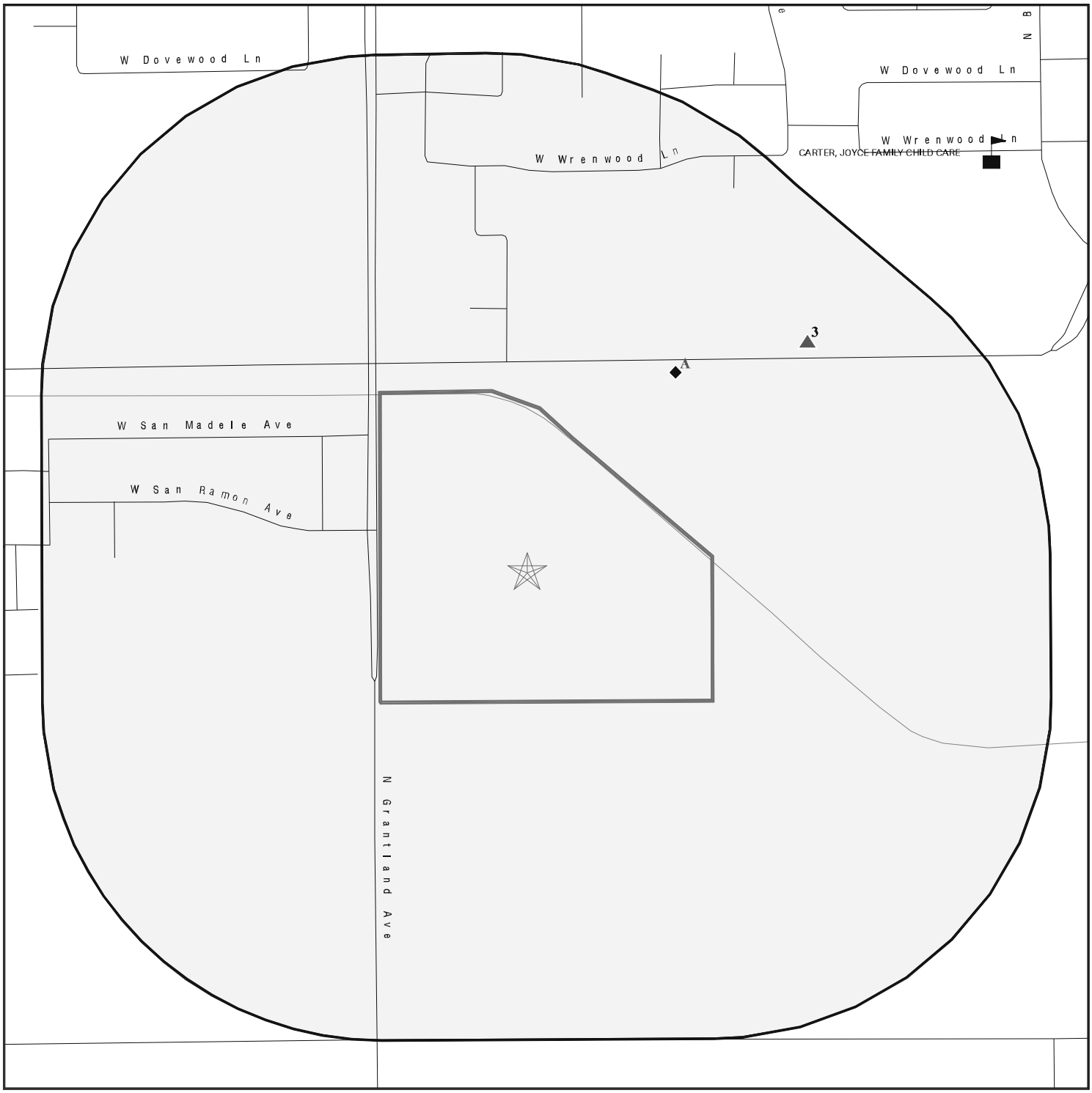
N

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:	Proposed Residential Development - Lennar	CLIENT:	Krazan & Associates, Inc.
ADDRESS:	5326 N. Grantland Avenue Fresno CA 93723	CONTACT:	Michael Bowery
		INQUIRY #:	5852828.2s
LAT/LONG:	36.812965 / 119.914464	DATE:	October 31, 2019 7:39 pm

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DETAIL MAP - 5852828.2S



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

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

Areas of Concern

N

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:	Proposed Residential Development - Lennar	CLIENT:	Krazan & Associates, Inc.
ADDRESS:	5326 N. Grantland Avenue Fresno CA 93723	CONTACT:	Michael Bowery
		INQUIRY #:	5852828.2s
LAT/LONG:	36.812965 / 119.914464	DATE:	October 31, 2019 7:40 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	1.000		0	0	0	0	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
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	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		0	0	NR	NR	NR	0
RCRA-VSQG	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	0.001		0	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	2	NR	2
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
CPS-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	0	NR	NR	NR	0
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		0	0	0	NR	NR	0
HAULERS	0.001		0	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
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	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	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		1	0	NR	NR	NR	1
HIST UST	0.250		1	0	NR	NR	NR	1
CERS TANKS	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		1	0	NR	NR	NR	1
Local Land Records								
LIENS	0.001		0	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
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	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	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	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	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	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		1	1	NR	NR	NR	2

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
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	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	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	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	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		0	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		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	4	1	0	2	0	7

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1
NE
< 1/8
0.086 mi.
456 ft.

H.B. BUCK RANCHES
6825 W BARSTOW
FRESNO, CA 93711

Site 1 of 2 in cluster A

SWEEPS UST **S101621994**
CA FID UST **N/A**
CUPA Listings

Relative:
Lower

Actual:
295 ft.

SWEEPS UST:

Name:	H.B. BUCK RANCHES
Address:	6825 W BARSTOW
City:	FRESNO
Status:	Active
Comp Number:	35178
Number:	9
Board Of Equalization:	Not reported
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	10-000-035178-000001
Tank Status:	A
Capacity:	300
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	1

CA FID UST:

Facility ID:	10006598
Regulated By:	UTNKA
Regulated ID:	00035178
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	2094391495
Mail To:	Not reported
Mailing Address:	6138 N VAN NESS BLVD
Mailing Address 2:	Not reported
Mailing City,St,Zip:	FRESNO 93711
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

CUPA FRESNO:

Name:	STORELLI PROPERTY
Address:	6825 W BARSTOW AVE
City,State,Zip:	FRESNO, CA 93722
Facility ID:	FA0276523
Cross Street:	Not reported
APM Number:	50528218
CERS Id:	Not reported
SWIS Number:	Not reported
GIS Latitude:	36.816164619
GIS Longitude:	-119.91354692
Program Element:	UST REMOVAL/CLOSURE W/1 TANK

A2
NE
< 1/8
0.086 mi.
456 ft.

H.B. BUCK RANCHES
6825 W BARSTOW AVE
FRESNO, CA 93711

Site 2 of 2 in cluster A

HIST UST **U001592117**
N/A

Relative:
Lower

Actual:
295 ft.

HIST UST:

Name:	H.B. BUCK RANCHES
Address:	6825 W BARSTOW AVE
City,State,Zip:	FRESNO, CA 93711
File Number:	Not reported
URL:	Not reported
Region:	STATE
Facility ID:	00000035178
Facility Type:	Other
Other Type:	FARM
Contact Name:	M.T. SANCHEZ
Telephone:	2094391495
Owner Name:	H.B. BUCK
Owner Address:	6138 N. VAN NESS BLVD.
Owner City,St,Zip:	FRESNO, CA 93711
Total Tanks:	0001
Tank Num:	001
Container Num:	1
Year Installed:	1969
Tank Capacity:	00000300
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None

3
NE
1/8-1/4
0.167 mi.
882 ft.

SAL'S WELDING & FABRICATION
6636 W BARSTOW
FRESNO, CA 93722

CUPA Listings **S104867286**
N/A

Relative:
Higher

Actual:
297 ft.

CUPA FRESNO:

Name:	SAL'S WELDING & FABRICATION
Address:	6636 W BARSTOW
City,State,Zip:	FRESNO, CA 93722
Facility ID:	FA0271449
Cross Street:	Not reported
APM Number:	50507025S
CERS Id:	Not reported
SWIS Number:	Not reported
GIS Latitude:	36.816264302
GIS Longitude:	-119.91073253
Program Element:	HAZ MAT DISCLOSURE-BELOW REPORTING QUANTITY

4
NE
1/2-1
0.976 mi.
5154 ft.

MID VALLEY EQUIPMENT & SALES
6101 N GOLDEN STATE
FRESNO, CA 93722

ENVIROSTOR **S104869120**
CUPA Listings **N/A**

Relative:
Higher

Actual:
302 ft.

ENVIROSTOR:

Name:	K & H BROS.
Address:	6101 N. GOLDEN STATE BLVD.
City,State,Zip:	FRESNO, CA 93722
Facility ID:	60000578
Status:	Refer: 1248 Local Agency
Status Date:	12/28/2007
Site Code:	Not reported
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	3.63
NPL:	NO
Regulatory Agencies:	FRESNO COUNTY
Lead Agency:	FRESNO COUNTY
Program Manager:	Not reported
Supervisor:	Kevin Shaddy
Division Branch:	Cleanup San Joaquin
Assembly:	23
Senate:	08
Special Program:	EPA - PASI
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not Applicable
Latitude:	36.82294
Longitude:	-119.9017
APN:	50508016
Past Use:	METAL RECLAMATION
Potential COC:	Lead TPH-diesel TPH-gas TPH-MOTOR OIL
Confirmed COC:	TPH-diesel TPH-gas Lead TPH-MOTOR OIL
Potential Description:	SOIL
Alias Name:	50508016
Alias Type:	APN
Alias Name:	Not reported
Alias Type:	Project Code (Site Code)
Alias Name:	60000578
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	09/05/2007
Comments:	Fresno County Env. Health is lead agency.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

MID VALLEY EQUIPMENT & SALES (Continued) **S104869120**

CUPA FRESNO:

Name:	MID VALLEY EQUIPMENT & SALES
Address:	6101 N GOLDEN STATE
City,State,Zip:	FRESNO, CA 937229337
Facility ID:	FA0273805
Cross Street:	Not reported
APM Number:	50508016T
CERS Id:	Not reported
SWIS Number:	Not reported
GIS Latitude:	36.822951699
GIS Longitude:	-119.90178103
Program Element:	CONTAMINATED SITE - MISC/DTSC LEAD

---

5 **GOLDEN STATE RANCH PROPERTY** **ENVIROSTOR** **S118756449**
South **ASHLAN AVENUE/GRANTLAND AVENUE** **SCH** **N/A**
1/2-1 **FRESNO, CA 93722**
0.991 mi.
5233 ft.

Relative:
Lower

Actual:
286 ft.

ENVIROSTOR:

Name:	GOLDEN STATE RANCH PROPERTY
Address:	ASHLAN AVENUE/GRANTLAND AVENUE
City,State,Zip:	FRESNO, CA 93722
Facility ID:	10010014
Status:	No Action Required
Status Date:	02/27/2002
Site Code:	104254
Site Type:	School Investigation
Site Type Detailed:	School
Acres:	155
NPL:	NO
Regulatory Agencies:	DTSC
Lead Agency:	DTSC
Program Manager:	Not reported
Supervisor:	Jose Salcedo
Division Branch:	Northern California Schools & Santa Susana
Assembly:	23
Senate:	08
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	School District
Latitude:	36.7972
Longitude:	-119.9117
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	NONE SPECIFIED No Contaminants found
Confirmed COC:	NONE SPECIFIED
Potential Description:	NMA
Alias Name:	CENTRAL USD
Alias Type:	Alternate Name
Alias Name:	CENTRAL USD-GOLDEN STATE RANCHES PRPERTY
Alias Type:	Alternate Name
Alias Name:	GOLDEN STATE RANCH PROPERTY
Alias Type:	Alternate Name
Alias Name:	104254
Alias Type:	Project Code (Site Code)

GOLDEN STATE RANCH PROPERTY (Continued) **S118756449**

Alias Name: 10010014
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 02/27/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Inspections/Visit (Non LUR)
Completed Date: 02/22/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 02/27/2002
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

SCH:

Name: GOLDEN STATE RANCH PROPERTY
Address: ASHLAN AVENUE/GRANTLAND AVENUE
City,State,Zip: FRESNO, CA 93722
Facility ID: 10010014
Site Type: School Investigation
Site Type Detail: School
Site Mgmt. Req.: NONE SPECIFIED
Acres: 155
National Priorities List: NO
Cleanup Oversight Agencies: DTSC
Lead Agency: DTSC
Lead Agency Description: * DTSC
Project Manager: Not reported
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Site Code: 104254
Assembly: 23
Senate: 08
Special Program Status: Not reported
Status: No Action Required
Status Date: 02/27/2002
Restricted Use: NO
Funding: School District

GOLDEN STATE RANCH PROPERTY (Continued) **S118756449**

Latitude:	36.7972
Longitude:	-119.9117
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	NONE SPECIFIED, No Contaminants found
Confirmed COC:	NONE SPECIFIED
Potential Description:	NMA
Alias Name:	CENTRAL USD
Alias Type:	Alternate Name
Alias Name:	CENTRAL USD-GOLDEN STATE RANCHES PRPERTY
Alias Type:	Alternate Name
Alias Name:	GOLDEN STATE RANCH PROPERTY
Alias Type:	Alternate Name
Alias Name:	104254
Alias Type:	Project Code (Site Code)
Alias Name:	10010014
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	02/27/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Inspections/Visit (Non LUR)
Completed Date:	02/22/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Phase 1
Completed Date:	02/27/2002
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

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: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
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 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

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: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
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

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: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
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: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 10/04/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list 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). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS 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 the 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. The 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 potential NPL site.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/27/2020
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: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
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: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
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: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
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: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly 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). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

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: 08/13/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
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: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
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: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
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: 09/09/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 14

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

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: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
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: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
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: 08/12/2019
Date Data Arrived at EDR: 08/13/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 57

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

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

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 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: No Update Planned

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 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 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 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: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

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: 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

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 07/02/2019
Date Data Arrived at EDR: 10/16/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 8

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
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: 04/12/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 04/08/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
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: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
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: 05/01/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 04/11/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
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: No Update Planned

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: No Update Planned

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: No Update Planned

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: No Update Planned

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: No Update Planned

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: No Update Planned

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: No Update Planned

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: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 42
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 41

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
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: 04/12/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 05/01/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 04/16/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
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: 05/02/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

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: 04/11/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

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: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Quarterly

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: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
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

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: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

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: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
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: 10/25/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 03/26/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 34

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
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: 10/28/2019
Next Scheduled EDR Contact: 02/10/2020
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: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
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

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 08/02/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
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: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
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: 06/30/2018
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/20/2020
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

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 10/22/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

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: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Quarterly

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 06/28/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

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: 12/04/2018
Date Data Arrived at EDR: 12/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
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

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing
Aboveground storage tank sites

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/11/2019
Number of Days to Update: 70

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

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

CERS TANKS: California Environmental Reporting System (CERS) Tanks
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/22/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

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: 08/29/2019
Date Data Arrived at EDR: 08/30/2019
Date Made Active in Reports: 10/29/2019
Number of Days to Update: 60

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
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: 07/30/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

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: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
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: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

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: 05/15/2019
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 58

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
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: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

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: 05/15/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

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: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
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: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
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: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 08/16/2019
Next Scheduled EDR Contact: 11/25/2019
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: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
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: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
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: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/18/2019
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: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
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: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
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: 09/30/2018
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 106

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/23/2019
Next Scheduled EDR Contact: 02/03/2020
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: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 12/16/2019
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: 04/25/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/21/2019
Next Scheduled EDR Contact: 02/03/2020
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: 08/20/2019
Date Data Arrived at EDR: 09/05/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 18

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 11/18/2019
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: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
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: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

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: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

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: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

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: 06/20/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 49

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
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: 09/06/2019
Next Scheduled EDR Contact: 12/16/2019
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: 09/03/2019
Next Scheduled EDR Contact: 12/16/2019
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: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/04/2019
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: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/15/2019
Next Scheduled EDR Contact: 01/13/2020
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: 07/01/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 85

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Quarterly

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: 06/30/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 78

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
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: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
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: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/06/2019
Next Scheduled EDR Contact: 01/19/2020
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: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/30/2019
Next Scheduled EDR Contact: 11/18/2019
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: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
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: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 06/06/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 140

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

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: 05/03/2019
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 71

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 08/27/2019
Next Scheduled EDR Contact: 12/09/2019
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: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
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: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/10/2019
Date Data Arrived at EDR: 09/10/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 37

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 09/10/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

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: 05/03/2019
Date Data Arrived at EDR: 06/05/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 90

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 10/10/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71
Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 07/06/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 85
Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

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: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79
Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
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: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing
list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64
Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 08/15/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

CUPA SAN FRANCISCO CO: CUPA Facility Listing
Cupa facilities

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 68

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 03/19/2019
Date Data Arrived at EDR: 03/22/2019
Date Made Active in Reports: 04/09/2019
Number of Days to Update: 18

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

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: 06/04/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 08/28/2019
Date Data Arrived at EDR: 08/30/2019
Date Made Active in Reports: 10/29/2019
Number of Days to Update: 60

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 59

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 09/18/2019
Next Scheduled EDR Contact: 12/30/2019
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: 07/19/2019
Date Data Arrived at EDR: 07/22/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 66

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
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: 08/16/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
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: 12/31/2017
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 54

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

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: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
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: 07/08/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
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: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 65
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

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: 05/17/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 08/12/2019
Date Data Arrived at EDR: 08/13/2019
Date Made Active in Reports: 10/16/2019
Number of Days to Update: 64
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
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: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
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: 06/17/2019
Date Data Arrived at EDR: 06/18/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 65
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
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: 04/27/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 34
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43
Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
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 boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 09/13/2018
Number of Days to Update: 64
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
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: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

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: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/22/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

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 Historical Auto 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 Historical 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

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: 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: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks
Underground storage tank sites located in Alameda county.

Date of Government Version: 04/10/2019
Date Data Arrived at EDR: 04/11/2019
Date Made Active in Reports: 06/20/2019
Number of Days to Update: 70

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 08/05/2019
Date Data Arrived at EDR: 08/07/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 63

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 09/23/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 08/20/2019
Date Data Arrived at EDR: 08/23/2019
Date Made Active in Reports: 10/22/2019
Number of Days to Update: 60

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 68

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: 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: 07/11/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/10/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 72

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/19/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

KERN COUNTY:

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/06/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 63

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: 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: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 08/16/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/15/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/22/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

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: N/A
Telephone: N/A
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/09/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 71

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/16/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 03/07/2019
Number of Days to Update: 51

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 04/30/2012
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 42
Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 10/18/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/25/2019
Next Scheduled EDR Contact: 10/07/2019
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 19
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: 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: 08/22/2019
Date Data Arrived at EDR: 08/26/2019
Date Made Active in Reports: 10/29/2019
Number of Days to Update: 64

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 10/18/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 05/23/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 07/25/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 62

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 09/30/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 02/21/2019
Date Data Arrived at EDR: 02/22/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/23/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 08/07/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 63

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 08/09/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 61

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 08/06/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 64

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/12/2019
Number of Days to Update: 69

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 74

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

ML SACRAMENTO: 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: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 09/13/2019
Number of Days to Update: 77

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 07/16/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: 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: 08/29/2019
Date Data Arrived at EDR: 08/30/2019
Date Made Active in Reports: 10/29/2019
Number of Days to Update: 60

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: 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: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing

A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

SAN DIEGO CO SAM: 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: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

LUST SAN FRANCISCO: 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: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 09/11/2019
Next Scheduled EDR Contact: 12/29/2019
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 08/06/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 1

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: 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: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

HIST LUST SANTA CLARA: 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

LUST SANTA CLARA: 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: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 08/28/2019
Date Data Arrived at EDR: 08/30/2019
Date Made Active in Reports: 10/29/2019
Number of Days to Update: 60

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 06/18/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 29

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/02/2019
Date Data Arrived at EDR: 07/02/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 80

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 07/18/2019
Date Data Arrived at EDR: 07/18/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 70

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 49

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 08/12/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 64

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: 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: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/21/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

LF VENTURA: 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: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: No Update Planned

LUST VENTURA: 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: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

MED WASTE VENTURA: 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: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63
Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/21/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 42
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 06/26/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/31/2019
Number of Days to Update: 33
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 07/26/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69
Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/10/2020
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: 05/14/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 83

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
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: 01/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 06/21/2019
Number of Days to Update: 51

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 12/07/2020
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 08/16/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
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 Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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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 was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

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 and Wildlife
Telephone: 916-445-0411

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

PROPOSED RESIDENTIAL DEVELOPMENT - LENNAR
5326 N. GRANTLAND AVENUE
FRESNO, CA 93723

TARGET PROPERTY COORDINATES

Latitude (North):	36.812965 - 36° 48' 46.67''
Longitude (West):	119.914464 - 119° 54' 52.07''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	240010.5
UTM Y (Meters):	4077885.8
Elevation:	296 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5603182 HERNDON, 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 principle 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).

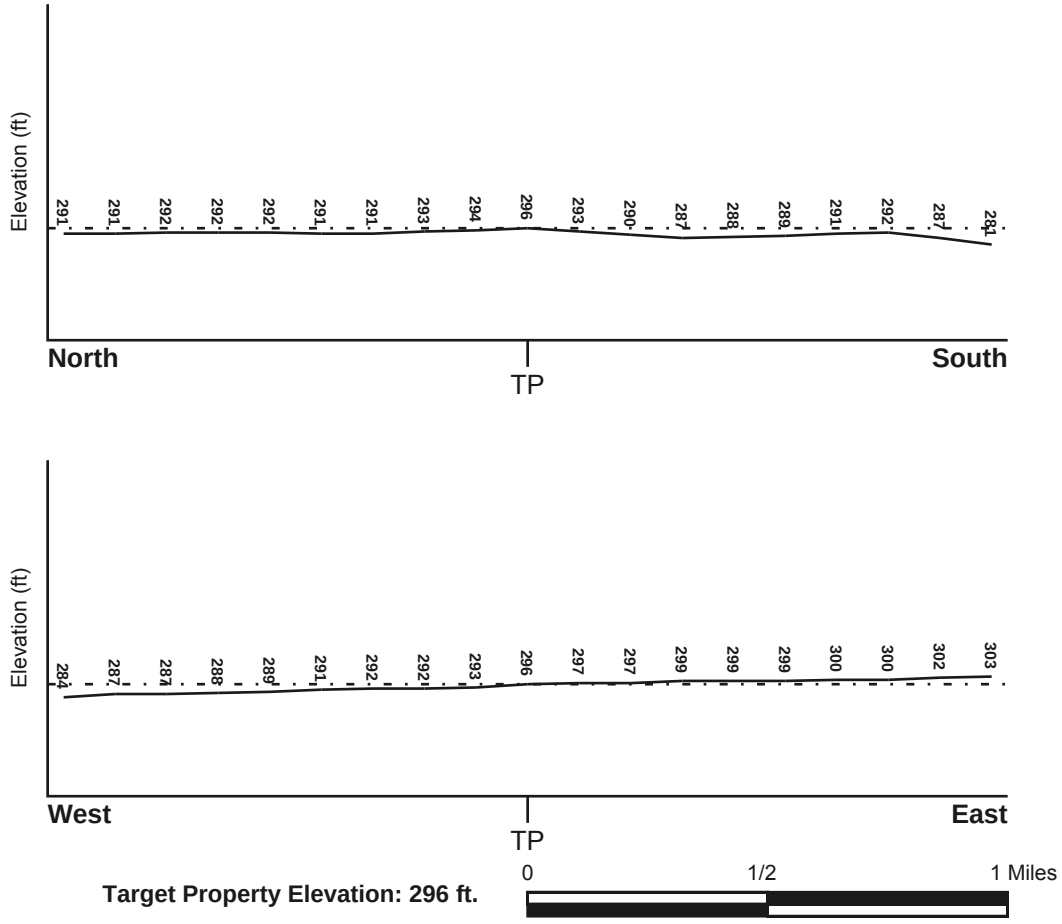
TOPOGRAPHIC INFORMATION

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 WSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



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

Flood Plain Panel at Target Property	FEMA Source Type
06019C1535H	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06019C1545H	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
HERNDON	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

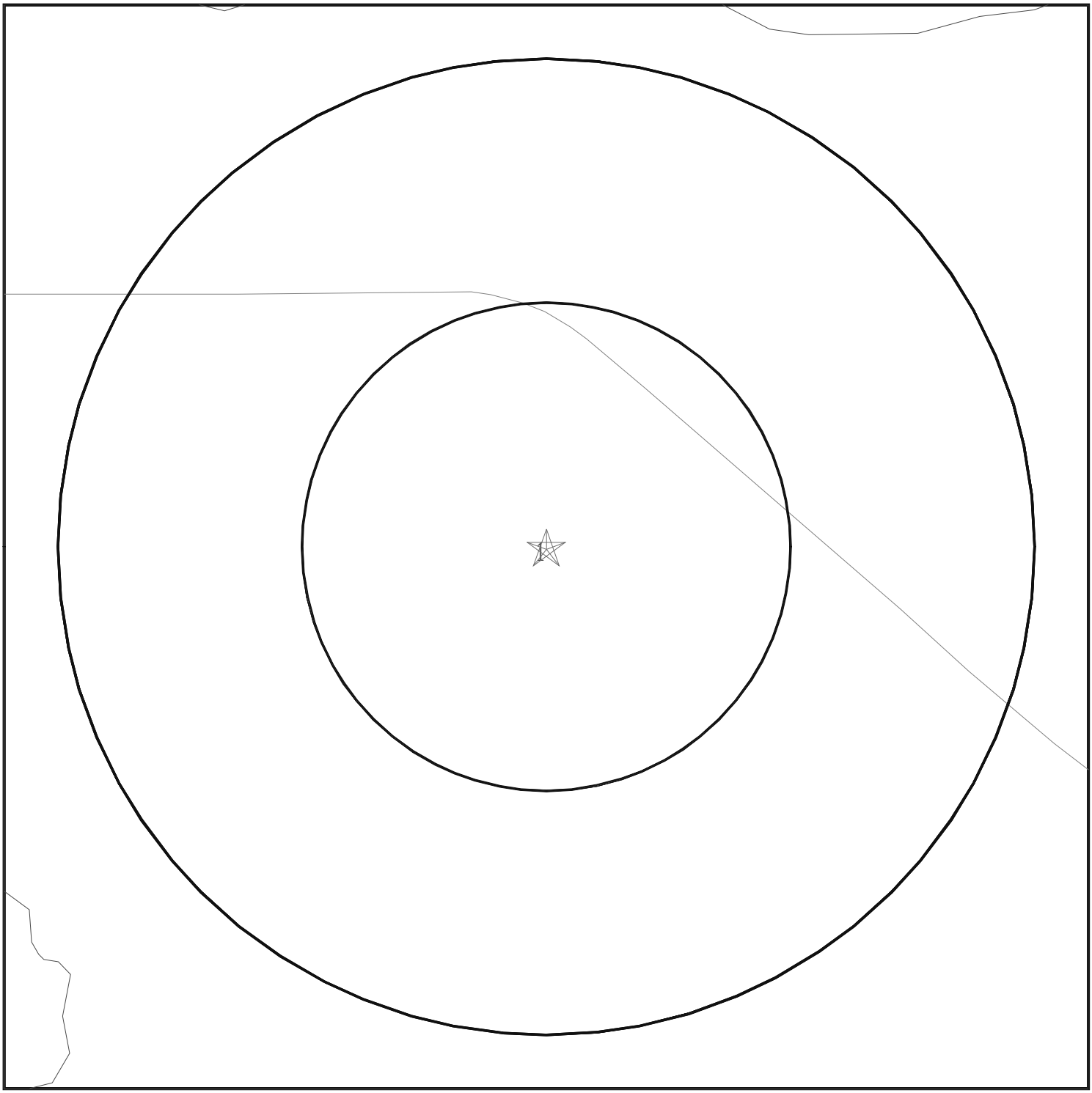
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

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 - 5852828.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Proposed Residential Development - Lennar	CLIENT:	Krazan & Associates, Inc.
ADDRESS:	5326 N. Grantland Avenue Fresno CA 93723	CONTACT:	Michael Bowery
		INQUIRY #:	5852828.2s
LAT/LONG:	36.812965 / 119.914464	DATE:	October 31, 2019 7:40 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: SAN JOAQUIN

Soil Surface Texture: sandy clay loam

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: Moderately well drained

Hydric Status: Partially 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	16 inches	27 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 6.5 Min: 5.6
2	27 inches	29 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 6.5 Min: 5.6
3	29 inches	35 inches	cemented	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 6.5 Min: 5.6
4	35 inches	59 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 6.5 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		
5	0 inches	16 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 6.5 Min: 5.6

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
2	USGS40000178109	1/2 - 1 Mile NNW
4	USGS40000177997	1/2 - 1 Mile WSW
5	USGS40000177900	1/2 - 1 Mile SW
6	USGS40000177882	1/2 - 1 Mile SSW
7	USGS40000177982	1/2 - 1 Mile ESE
8	USGS40000177860	1/2 - 1 Mile South

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.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CADWR8000030097	1/4 - 1/2 Mile SE
3	CADWR8000030092	1/2 - 1 Mile ESE
9	11575	1/2 - 1 Mile NNW

PHYSICAL SETTING SOURCE MAP - 5852828.2s



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

0 1/4 1/2 1 Miles

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:	Proposed Residential Development - Lennar	CLIENT:	Krazan & Associates, Inc.
ADDRESS:	5326 N. Grantland Avenue Fresno CA 93723	CONTACT:	Michael Bowery
		INQUIRY #:	5852828.2s
LAT/LONG:	36.812965 / 119.914464	DATE:	October 31, 2019 7:40 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
SE
1/4 - 1/2 Mile
Lower

CA WELLS **CADWR8000030097**

State Well #:	13S19E09P001M	Station ID:	32869
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Kings	Well Completion Rpt #:	Not Reported

2
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS40000178109**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S019E08A001M	Type:	Well
Description:	Not Reported	HUC:	18030012
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Central Valley aquifer system		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19500831	Well Depth:	176
Well Depth Units:	ft	Well Hole Depth:	203
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1963-10-14
Feet below surface:	69.89	Feet to sea level:	Not Reported
Note:	Not Reported		

3
ESE
1/2 - 1 Mile
Lower

CA WELLS **CADWR8000030092**

State Well #:	13S19E09Q001M	Station ID:	15826
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Kings	Well Completion Rpt #:	Not Reported

4
WSW
1/2 - 1 Mile
Lower

FED USGS **USGS40000177997**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S019E08N001M	Type:	Well
Description:	Not Reported	HUC:	18030012
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Central Valley aquifer system		
Formation Type:	Not Reported	Aquifer Type:	Not Reported

Construction Date:	1960	Well Depth:	117
Well Depth Units:	ft	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

Ground water levels,Number of Measurements:	1	Level reading date:	1963-10-14
Feet below surface:	59.65	Feet to sea level:	Not Reported
Note:	Not Reported		

5
SW
1/2 - 1 Mile
Lower

FED USGS **USGS40000177900**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S019E17G001M	Type:	Well
Description:	Not Reported	HUC:	18030012
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Central Valley aquifer system		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19790720	Well Depth:	140
Well Depth Units:	ft	Well Hole Depth:	145
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	2	Level reading date:	1987-03-02
Feet below surface:	58.66	Feet to sea level:	Not Reported
Note:	Not Reported		

Level reading date:	1979-07-20	Feet below surface:	72
Feet to sea level:	Not Reported	Note:	Not Reported

6
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40000177882**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S019E17H002M	Type:	Well
Description:	6/6/01	HUC:	18030012
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Central Valley aquifer system		
Formation Type:	Quaternary Alluvium	Aquifer Type:	Unconfined single aquifer
Construction Date:	19850702	Well Depth:	145
Well Depth Units:	ft	Well Hole Depth:	145
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	2	Level reading date:	1993
Feet below surface:	75	Feet to sea level:	Not Reported
Note:	Not Reported		

Level reading date:	1985-07-02	Feet below surface:	65
Feet to sea level:	Not Reported	Note:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

7
ESE **FED USGS** **USGS40000177982**
1/2 - 1 Mile
Higher

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S019E09Q001M	Type:	Well
Description:	Not Reported	HUC:	18030012
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Central Valley aquifer system		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

Ground water levels,Number of Measurements:	1	Level reading date:	1963-10-14
Feet below surface:	64.32	Feet to sea level:	Not Reported
Note:	Not Reported		

8
South **FED USGS** **USGS40000177860**
1/2 - 1 Mile
Lower

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	013S019E17H001M	Type:	Well
Description:	Not Reported	HUC:	18030012
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Central Valley aquifer system		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19620209	Well Depth:	192
Well Depth Units:	ft	Well Hole Depth:	210
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1963-10-14
Feet below surface:	70.92	Feet to sea level:	Not Reported
Note:	Not Reported		

9
NNW **CA WELLS** **11575**
1/2 - 1 Mile
Lower

Seq:	11575	Prim sta c:	13S/19E-05J01 M
Frds no:	1000108001	County:	10
District:	40	User id:	10C
System no:	1000108	Water type:	G
Source nam:	HERNDON SCHOOL	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	364936.0	Longitude:	1195501.0
Precision:	3	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported

Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		
System no:	1000108	System nam:	Herndon School
Hqname:	Not Reported	Address:	Not Reported
City:	Not Reported	State:	Not Reported
Zip:	Not Reported	Zip ext:	Not Reported
Pop serv:	0	Connection:	0
Area serve:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for FRESNO 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 FRESNO COUNTY, CA

Number of sites tested: 100

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.251 pCi/L	98%	2%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	1.433 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 was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

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 and Wildlife
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.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
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.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
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.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

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.

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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WATER SUPPLY ASSESSMENT

VETTING TENTATIVE TRACT MAP (VTTM) 6472



OCTOBER 2025

WATER SUPPLY ASSESSMENT

VETTING TENTATIVE TRACT MAP 6472

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October 2025

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Project #200124.03

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SECTION 1 - INTRODUCTION

1.1 - Regulatory Requirement

Senate Bill 610 (Chapter 643, Statutes of 2001) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and land use decisions made by cities and counties. The statute requires detailed information regarding water availability to be provided to city and county decision-makers prior to approval of specified large development projects which are subject to CEQA (the California Environmental Quality Act) approval. These include residential, commercial, and industrial uses. The statute also requires this detailed information to be included in the administrative record that serves as the evidentiary basis for an entitlement action by the city or county on such projects. The statute-required water supply assessment (WSA) must examine the availability and sufficiency of an identified water supply under normal-year, single-dry-year, and multiple-dry-year conditions over a 20-year projection, accounting for the projected water demand of the Project in addition to other existing and planned future uses of the identified water supply.

The State Department of Water Resources "Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001" (Guidebook) and the sample format presented in the Guidebook were used as guides in preparing this water supply assessment. Pertinent excerpts from the law stipulating requirements for water supply assessments precede Sections of this report. The full text of Chapter 643, Statutes of 2001 (SB 610) is included in Appendix A.

1.2 - Project Description and Location

The Project is a 30.74-acre single-family residential subdivision to be developed by Lennar on a site in northwestern Fresno. The Project site is located at the southeast corner of North Grantland Avenue and West Barstow Avenue (Figure 1-1 and Figure 1-2). The Project is within Section 9, Township 13 South, Range 19 East.

The proposed Project site is currently agriculture. The site is currently Residential Medium Density within the West Area Neighborhoods Specific Plan (WANSP).

Vesting Tentative Tract Map (6294) proposes to subdivide the Project Site (APN 505-060-07) into 187 single-family lots with five outlots (Figure 1-3). The five outlots will be allocated to the following uses:

- Outlot A will be dedicated for open space and recreation in the center of the residential subdivision.
- Outlot B through Outlot D will be dedicated for landscaping, irrigation and pedestrian purposes, located along North Grantland Avenue frontage.
- Outlot E is located near the southeastern corner boundary and will be dedicated for connectivity to a future pedestrian trail.

1.3 - Project Water Requirements and Setting

Water needed for construction will be obtained from the City of Fresno which obtains groundwater from wells located on land within the City or surface water from the Friant-Kern Canal. The current water distribution system is adjacent to the project site. The construction process is estimated to take approximately 2.5 years. Construction water demands are estimated to be approximately 225 gpd/acre for the duration of construction or 19.43 acre-feet total (7.77 acre-feet per year), which is equivalent to approximately 6,311,300 gallons total (2,524,520 gallons per year. Bottled drinking water will be provided for crews during construction activities.

Initial construction water usage will be in support of site preparation and grading activities. During earthwork for grading of access road foundations, building foundations and project components, the principal use of water would be for compaction and dust control. Smaller quantities would be required for preparation of the concrete required for foundations and other minor uses. After the earthwork activities, water usage will be used for dust suppression and normal construction water requirements that are associated with construction of the buildings, internal access roads, and revegetation.

The long-term average day operational water demand will be for the residential users and is anticipated to be approximately 47.3 million gallons per year or 145.16 acre-feet per year for the total build out of the Project. This is based on each residential unit having an average day water demand of 693 gallons per day (based on the 198-gallon per capita/day average in the 2020 City of Fresno Urban Water Management Plan and 3.5 people per unit) across the entire buildout of 187 units for the Project.

Figures 1-4 and 1-5 illustrate the location of the Project site within the Tulare Lake Hydrologic Region, the San Joaquin Valley Groundwater Basin and the Kings Subbasin, and the borders of these water resource areas. Construction and operational water for the Project will be from sources pumping groundwater from this basin or from the City surface water treatment plants. The Kings Subbasin does not have any adjudicated areas.

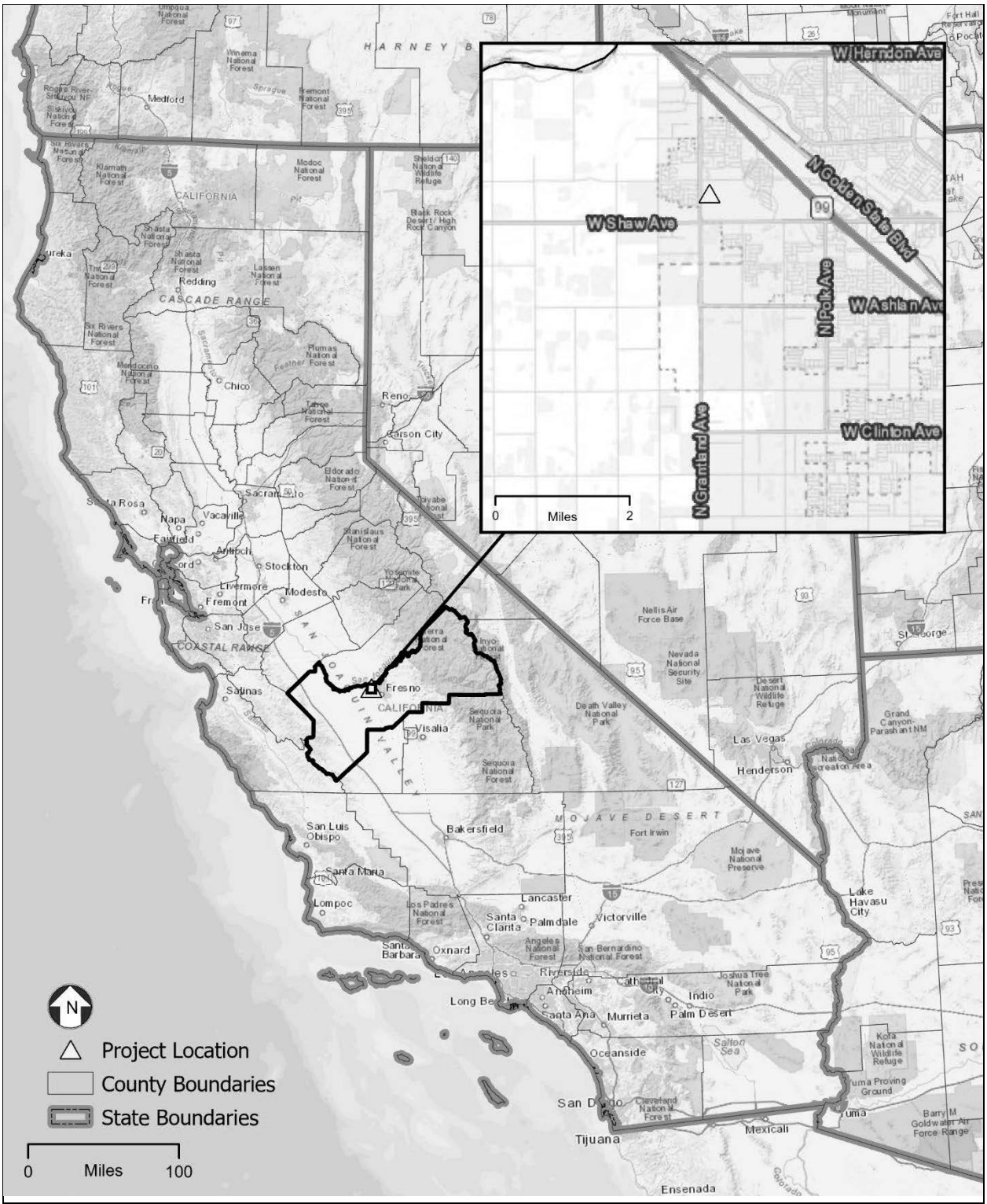
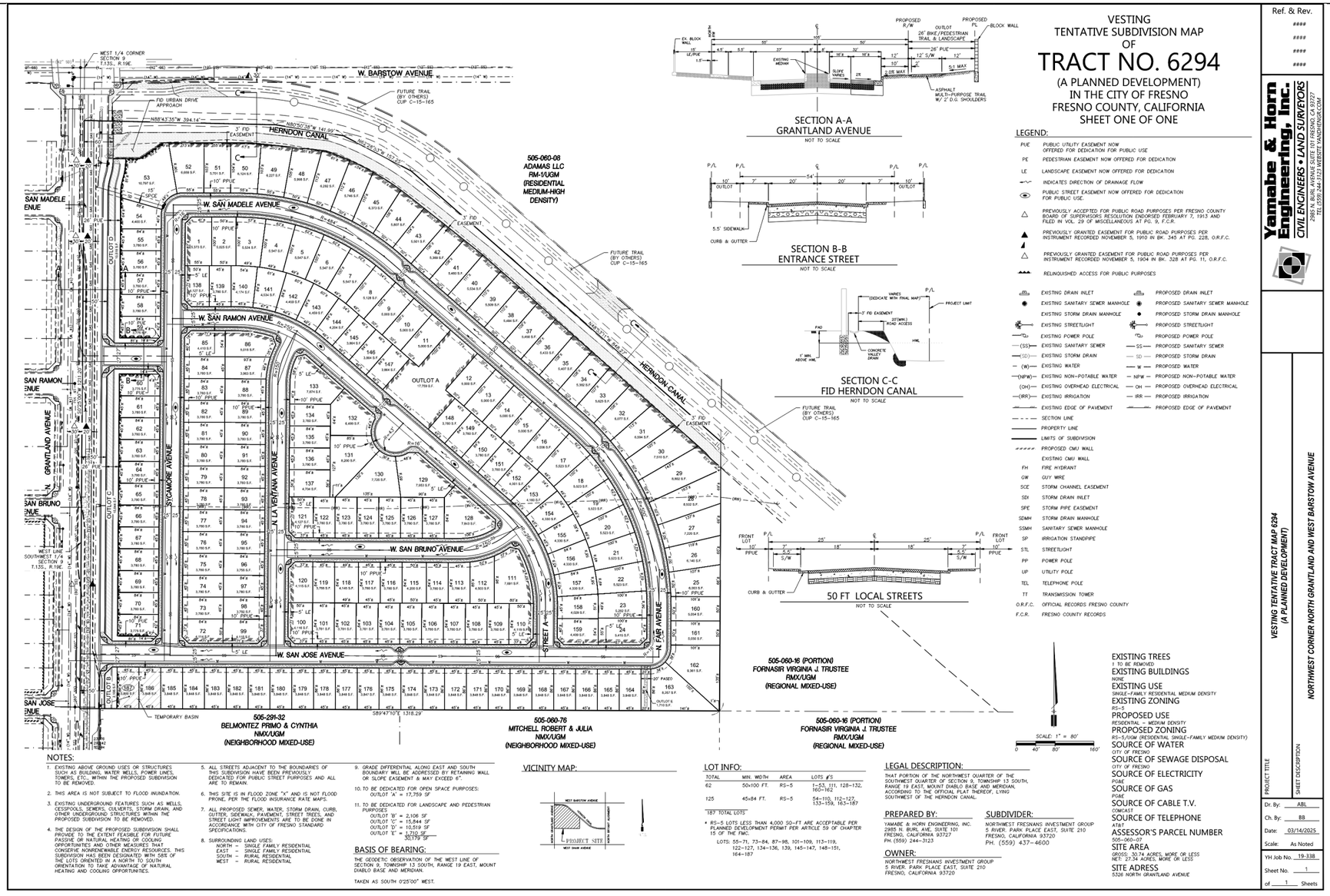


Figure 1-1
Regional Location



Figure 1-2
Project Site



VESTING
TENTATIVE SUBDIVISION MAP
OF

TRACT NO. 6294

(A PLANNED DEVELOPMENT)
IN THE CITY OF FRESNO
FRESNO COUNTY, CALIFORNIA
SHEET ONE OF ONE

LEGEND:

PUE	PUBLIC UTILITY EASEMENT NOW OFFERED FOR DEDICATION FOR PUBLIC USE
PE	PEDESTRIAN EASEMENT NOW OFFERED FOR DEDICATION
LE	LANDSCAPE EASEMENT NOW OFFERED FOR DEDICATION
	INDICATES DIRECTION OF DRAINAGE FLOW
	PUBLIC STREET EASEMENT NOW OFFERED FOR DEDICATION FOR PUBLIC USE.
△	PREVIOUSLY ACCEPTED FOR PUBLIC ROAD PURPOSES PER FRESNO COUNTY BOARD OF SUPERVISORS RESOLUTION ENDORSED FEBRUARY 7, 1913 AND FILED IN VOL. 29 OF MISCELLANEOUS AT PG. 9, F.C.R.
▲	PREVIOUSLY GRANTED EASEMENT FOR PUBLIC ROAD PURPOSES PER INSTRUMENT RECORDED NOVEMBER 5, 1910 IN BK. 345 AT PG. 228, O.R.F.C.
△	PREVIOUSLY GRANTED EASEMENT FOR PUBLIC ROAD PURPOSES PER INSTRUMENT RECORDED NOVEMBER 5, 1904 IN BK. 328 AT PG. 11, O.R.F.C.
	RELINQUISHED ACCESS FOR PUBLIC PURPOSES
	EXISTING DRAIN INLET
	EXISTING SANITARY SEWER MANHOLE
	EXISTING STORM DRAIN MANHOLE
	EXISTING STREETLIGHT
	EXISTING POWER POLE
(SS)	EXISTING SANITARY SEWER
(SD)	EXISTING STORM DRAIN
(W)	EXISTING WATER
(NPW)	EXISTING NON-POTABLE WATER
(OH)	EXISTING OVERHEAD ELECTRICAL
(IRR)	EXISTING IRRIGATION
	EXISTING EDGE OF PAVEMENT
	SECTION LINE
	PROPERTY LINE
	LIMITS OF SUBDIVISION
	PROPOSED CMU WALL
	EXISTING CMU WALL
FH	FIRE HYDRANT
GW	GUY WIRE
SCE	STORM CHANNEL EASEMENT
SDI	STORM DRAIN INLET
SPE	STORM PIPE EASEMENT
SDMH	STORM DRAIN MANHOLE
SSMH	SANITARY SEWER MANHOLE
SP	IRRIGATION STANDPIPE
STL	STREETLIGHT
PP	POWER POLE
UP	UTILITY POLE
TEL	TELEPHONE POLE
TT	TRANSMISSION TOWER
O.R.F.C.	OFFICIAL RECORDS FRESNO COUNTY
F.C.R.	FRESNO COUNTY RECORDS
	PROPOSED DRAIN INLET
	PROPOSED SANITARY SEWER MANHOLE
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STREETLIGHT
	PROPOSED POWER POLE
SS	PROPOSED SANITARY SEWER
SD	PROPOSED STORM DRAIN
W	PROPOSED WATER
NPW	PROPOSED NON-POTABLE WATER
OH	PROPOSED OVERHEAD ELECTRICAL
IRR	PROPOSED IRRIGATION
	PROPOSED EDGE OF PAVEMENT

EXISTING TREES
1 TO BE REMOVED
EXISTING BUILDINGS
NONE
EXISTING USE
SINGLE-FAMILY RESIDENTIAL MEDIUM DENSITY
EXISTING ZONING
RS-5
PROPOSED USE
RESIDENTIAL – MEDIUM DENSITY
PROPOSED ZONING
RS-5/UGM (RESIDENTIAL SINGLE-FAMILY MEDIUM DENSITY)
SOURCE OF WATER
CITY OF FRESNO
SOURCE OF SEWAGE DISPOSAL
CITY OF FRESNO
SOURCE OF ELECTRICITY
PG&E
SOURCE OF GAS
PG&E
SOURCE OF CABLE T.V.
COMCAST
SOURCE OF TELEPHONE
AT&T
ASSESSOR'S PARCEL NUMBER
505-060-07
SITE AREA
GROSS: 30.74 ACRES, MORE OR LESS
NET: 27.34 ACRES, MORE OR LESS
SITE ADRESS
5326 NORTH GRANTLAND AVENUE

NOTES:

1. EXISTING ABOVE GROUND USES OR STRUCTURES SUCH AS BUILDING, WATER WELLS, POWER LINES, TOWERS, ETC., WITHIN THE PROPOSED SUBDIVISION TO BE REMOVED.
2. THIS AREA IS NOT SUBJECT TO FLOOD INUNDATION.
3. EXISTING UNDERGROUND FEATURES SUCH AS WELLS, CESSPOOLS, SEWERS, CULVERTS, STORM DRAIN, AND OTHER UNDERGROUND STRUCTURES WITHIN THE PROPOSED SUBDIVISION TO BE REMOVED.
4. THE DESIGN OF THE PROPOSED SUBDIVISION SHALL PROVIDE TO THE EXTENT FEASIBLE FOR FUTURE PASSIVE OR NATURAL HEATING OR COOLING OPPORTUNITIES AND OTHER MEASURES THAT CONSERVE NONRENEWABLE ENERGY RESOURCES. THIS SUBDIVISION HAS BEEN DESIGNED TO WITH 50% OF THE LOTS ORIENTED IN A NORTH TO SOUTH ORIENTATION TO TAKE ADVANTAGE OF NATURAL HEATING AND COOLING OPPORTUNITIES.
5. ALL STREETS ADJACENT TO THE BOUNDARIES OF THIS SUBDIVISION HAVE BEEN PREVIOUSLY DEDICATED FOR PUBLIC STREET PURPOSES AND ALL ARE TO REMAIN.
6. THIS SITE IS IN FLOOD ZONE "X" AND IS NOT FLOOD PRONE, PER THE FLOOD INSURANCE RATE MAPS.
7. ALL PROPOSED SEWER, WATER, STORM DRAIN, CURB, GUTTER, SIDEWALK, PAVEMENT, STREET TREES, AND STREET LIGHT IMPROVEMENTS ARE TO BE DONE IN ACCORDANCE WITH CITY OF FRESNO STANDARD SPECIFICATIONS.
8. SURROUNDING LAND USES:
   NORTH – SINGLE FAMILY RESIDENTIAL
   EAST – SINGLE FAMILY RESIDENTIAL
   SOUTH – RURAL RESIDENTIAL
   WEST – RURAL RESIDENTIAL
9. GRADE DIFFERENTIAL ALONG EAST AND SOUTH BOUNDARY WILL BE ADDRESSED BY RETAINING WALL OR SLOPE EASEMENT & MAY EXCEED 6".
10. TO BE DEDICATED FOR OPEN SPACE PURPOSES:
    OUTLOT 'A' = 17,759 SF
11. TO BE DEDICATED FOR LANDSCAPE AND PEDESTRIAN PURPOSES
    OUTLOT 'B' = 2,106 SF
    OUTLOT 'C' = 15,844 SF
    OUTLOT 'D' = 10,519 SF
    OUTLOT 'E' = 1,710 SF
    30,179 SF

VICINITY MAP:

BASIS OF BEARING:

THE GEODETIC OBSERVATION OF THE WEST LINE OF SECTION 9, TOWNSHIP 13 SOUTH, RANGE 19 EAST, MOUNT DIABLO BASE AND MERIDIAN.

TAKEN AS SOUTH 0°25'00" WEST.

LOT INFO:

TOTAL	MIN. WIDTH	AREA	LOTS #'S
62	50x100 FT.	RS-5	1-53, 111, 128-132, 160-162
125	45x84 FT.	RS-5	54-110, 112-127, 133-159, 163-187

187 TOTAL LOTS

* RS-5 LOTS LESS THAN 4,000 SQ-FT ARE ACCEPTABLE PER PLANNED DEVELOPMENT PERMIT PER ARTICLE 59 OF CHAPTER 15 OF THE FMC.

LOTS: 55-71, 73-84, 87-98, 101-109, 113-119, 122-127, 134-136, 139, 145-147, 148-151, 164-187

LEGAL DESCRIPTION:

THAT PORTION OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 9, TOWNSHIP 13 SOUTH, RANGE 19 EAST, MOUNT DIABLO BASE AND MERIDIAN, ACCORDING TO THE OFFICIAL PLAT THEREOF, LYING SOUTHWEST OF THE HERNDON CANAL.

PREPARED BY:

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####
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PROJECT TITLE: VESTING TENTATIVE TRACT MAP 6294 (A PLANNED DEVELOPMENT)
SHEET DESCRIPTION: NORTHWEST CORNER NORTH GRANTLAND AND WEST BARSTOW AVENUE

Dr. By: ABL
Ch. By: BB
Date: 03/14/2025
Scale: As Noted
YH Job No. 19-338
Sheet No. 1
of 1 Sheets

Figure 1-3
Project Site – Tentative Parcel Map

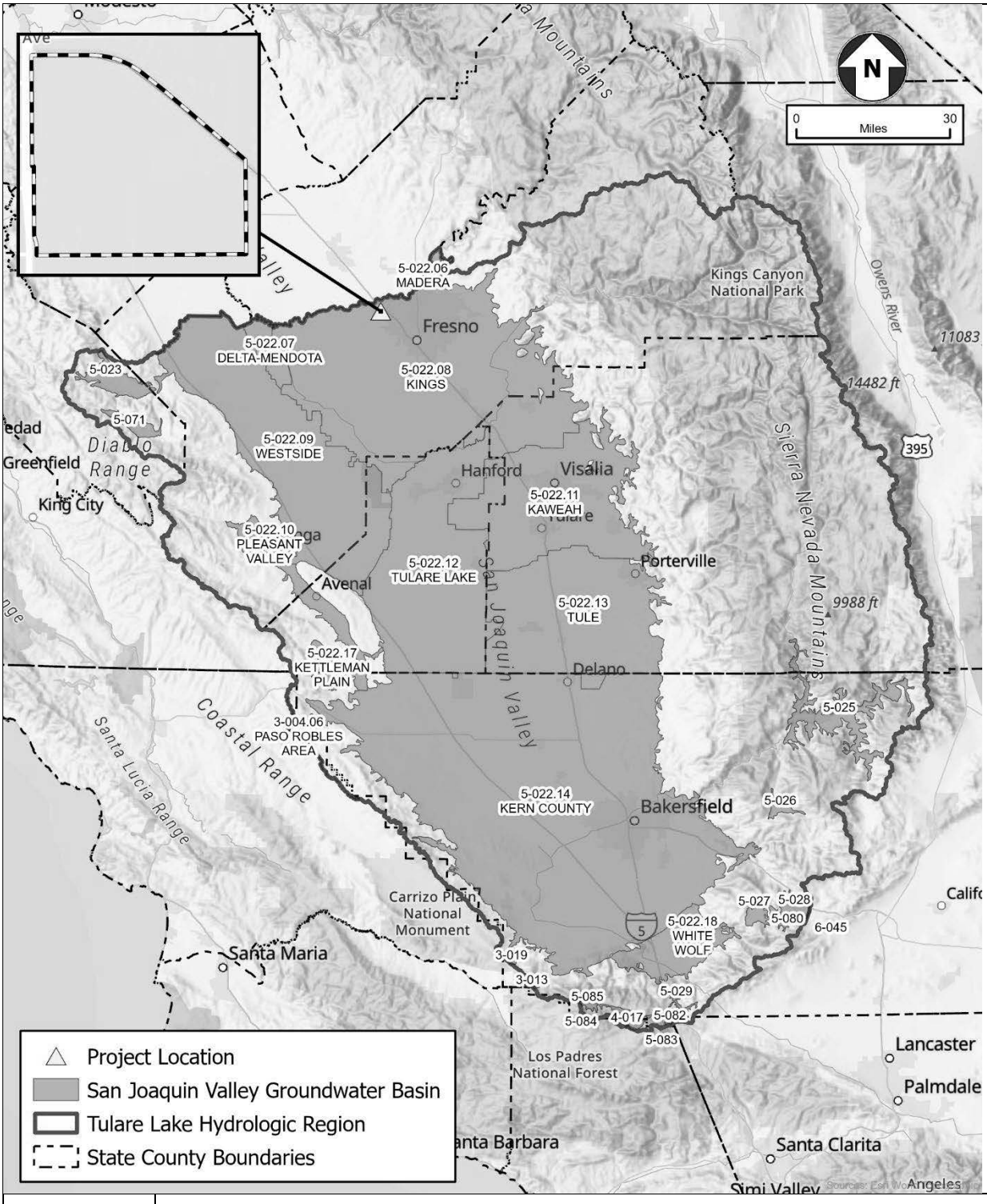


Figure 1-4
Project Location: Tulare Lake Hydrologic Region

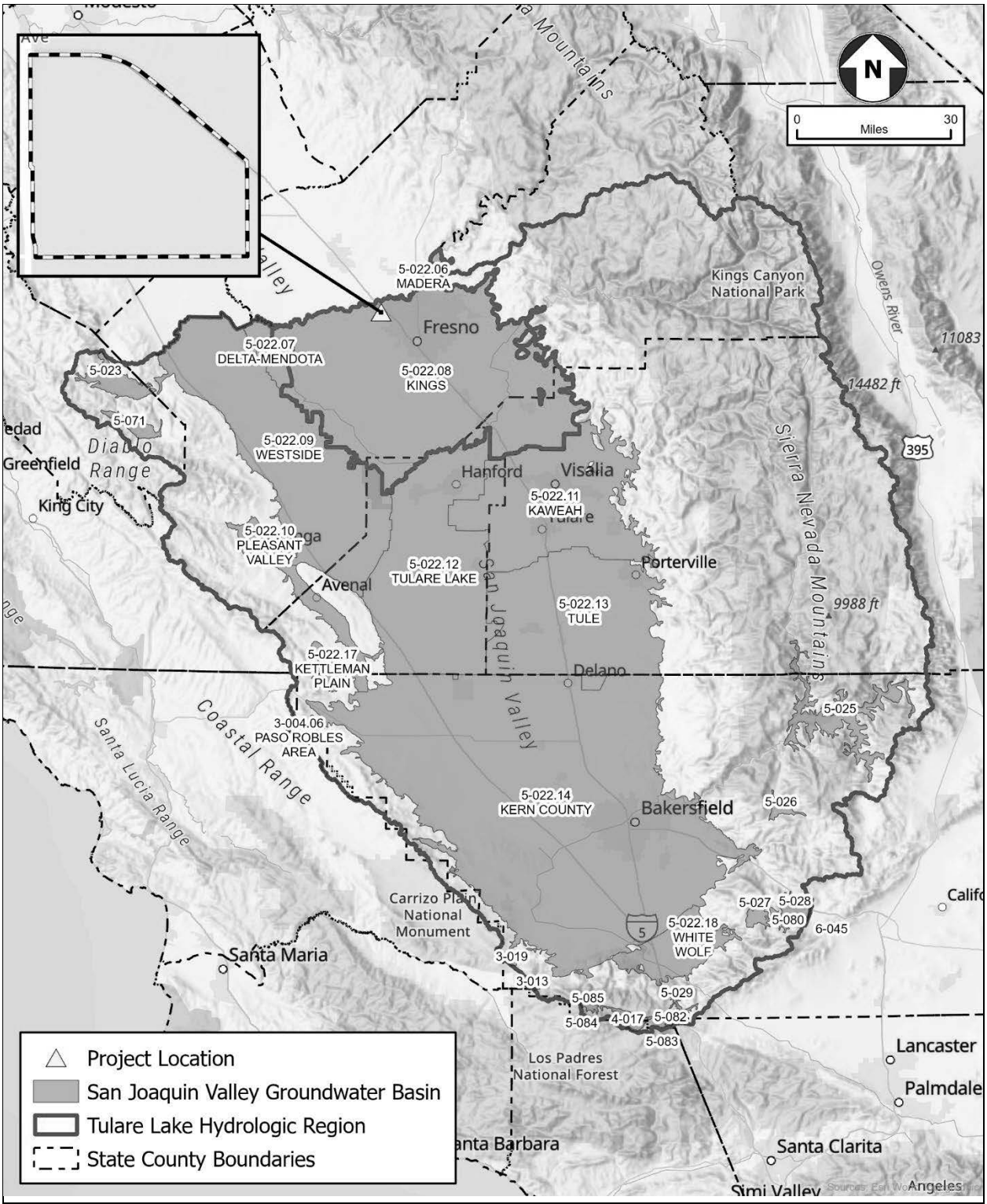


Figure 1-5
Project Location: Kings Groundwater Subbasin

SECTION 2 - WATER RESOURCES/WATER SUPPLY

2.1 - Proposed Water Supply

The Project will be served by a public water system as required by Water Code section 10910(b). The purpose of the Water Supply Assessment is to determine "If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g). If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

The City of Fresno is required to adopt an urban water management plan since the city serves more than 3,000 connections. The 2020 UWMP will be used for this water supply assessment. The 2020 UWMP will be used to obtain the following:

> "a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project."

In making the sufficiency determination, the public water system shall include an assessment of the following from Water Code Section 10910.

Water Code Section 10910

> (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.
>
> (b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system whose service area includes the project site and any water system adjacent to the project site that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public

water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site.

(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

The long-term average day operational water demand will be for the residential users and is anticipated to be approximately 47.3 million gallons per year or 145.16 acre-feet per year for the total build out of the Project. This is based on each residential unit having an average day water demand of 693 gallons per day (based on the 198-gallon per capita/day average in the 2020 City of Fresno Urban Water Management Plan and 3.5 people per unit) across the entire buildout of 187 units for the Project.

Project water supply during construction and for the developed properties is proposed to be from the City of Fresno.

2.2 - Hydrologic Region

The Water Supply Assessment evaluates the physical availability of and adequate groundwater supply, in all "water years" for a 20-year period.

This Assessment describes the relevant Hydrologic Region, Basin, and Subbasin, describes the principal water agency (City of Fresno) serving and regulating Basin water planning and surface water importation, and lists water sufficiency and planning documents regarding the Basin. Section 3 includes the latest (2020) City of Fresno projection of water availability (ground) for the Basin for a 20-year period under the normal, single dry and multiple dry year scenarios, as required by SB 610.

Water Code Section 10910

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2)(A) A description of any groundwater basin or basins from which the proposed project will be supplied.

(B) For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree.

(C) For a basin that has not been adjudicated that is a basin designated as high- or medium-priority pursuant to Section 10722.4 , information regarding the following:

(i) Whether the department has identified the basin as being subject to critical conditions of overdraft pursuant to Section 12924 .

(ii) If a groundwater sustainability agency has adopted a groundwater sustainability plan or has an approved alternative, a copy of that alternative or plan.

(D) For a basin that has not been adjudicated that is a basin designated as low- or very low priority pursuant to Section 10722.4 , information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

2.2.1 - GROUNDWATER - THE TULARE LAKE HYDROLOGIC REGION

The California Department of Water Resources, (DWR) has divided the State into 10 Hydrologic Regions. The Project site is located within the Tulare Lake Hydrologic Region in a Basin ranked as "high priority" in a statewide ranking of groundwater importance. The Region encompasses approximately 16,800 square miles (see Figure 1-4).

2.2.2 - THE KINGS GROUNDWATER SUBBASIN

As shown in Figure 2-1, the City of Fresno is located in the Kings Subbasin (DWR Subbasin 5-22.08) which is in the greater Tulare Lake hydrologic region (DWR Basin 5.22), and also within the larger San Joaquin Valley Groundwater Basin (CA Natural Resources Agency, 2018). The Kings Subbasin covers approximately 1,530 square miles. The Kings Subbasin is generally bounded: on the north by the San Joaquin River; on the west by the Fresno Slough; on the south by the Kings River and Cottonwood Creek; and on the east by the Sierra foothills.

Groundwater in the Basin is used for all water supply for the City of Fresno. The city participates in and is a member of the North Kings Groundwater Sustainability Agency (NKGSA). The NKGSA adopted a Groundwater Sustainability Plan in December 2019.

2.2.3 - SURFACE WATER

Surface water is now a primary water supply used to meet potable demands within the City. The City contracts with FID (Fresno Irrigation District) for Kings River water and with the USBR (United States Bureau of Reclamation) for CVP (Central Valley Project) water from the Friant-Kern Canal. The surface water supply is used either for potable uses through treatment and distribution or delivery to recharge basins for groundwater recharge.

The City, through an agreement originally executed in January 1961, secured a surface water supply from USBR CVP Friant Division. This agreement, for an annual water supply of 60,000 AF of Class 1 water, was last renewed in 2010 as a Section 9(d) contract that provides water from the San Joaquin River in perpetuity. The USBR CVP Friant Division facilities generally include: Friant Dam (Millerton Reservoir), the Friant-Kern Canal, and the Madera Canal. The Friant-Kern Canal is maintained and operated by the Friant Water Authority. The USBR water supply is a wholesale supply.

Construction of Friant Dam was completed in 1947 and began making diversions to the Friant- Kern Canal in 1949. Full operations of the CVP Friant Division did not commence until the Madera Canal was completed in 1951. Class 1 water was intended to be a supply that would be dependable in practically every year, regardless of the type of hydrologic WY. Class 2 water is essentially excess water available as determined by USBR and less reliable than Class 1 water.

Class 1 water has historically been very reliable until the 2006 San Joaquin River Restoration Settlement Agreement between the Department of the Interior and Commerce, the Natural Resources Defense Council, and the Friant Water Users Authority (which is now the Friant

Water Authority). The City is a member of the Friant Water Authority. The Settlement ended an 18-year legal dispute over the operation of Friant Dam brought by a coalition of conservation and fishing groups. The agreement characterized Class 1 deliveries by six hydrologic year types based on a recurrence over an 82-year simulation (1922–2003): wet, normal-wet, normal-dry, dry, critical- high, critical-low. The average simulated delivery is 53,680 AFY and the median simulated delivery, which is similar to normal year delivery, is 60,000 AFY. The median value is higher than the average value because 100% allocation of 60,000 AF is simulated in 50 of 82 years but the dry and critical years result in substantial reductions, which bring down the average allocation.

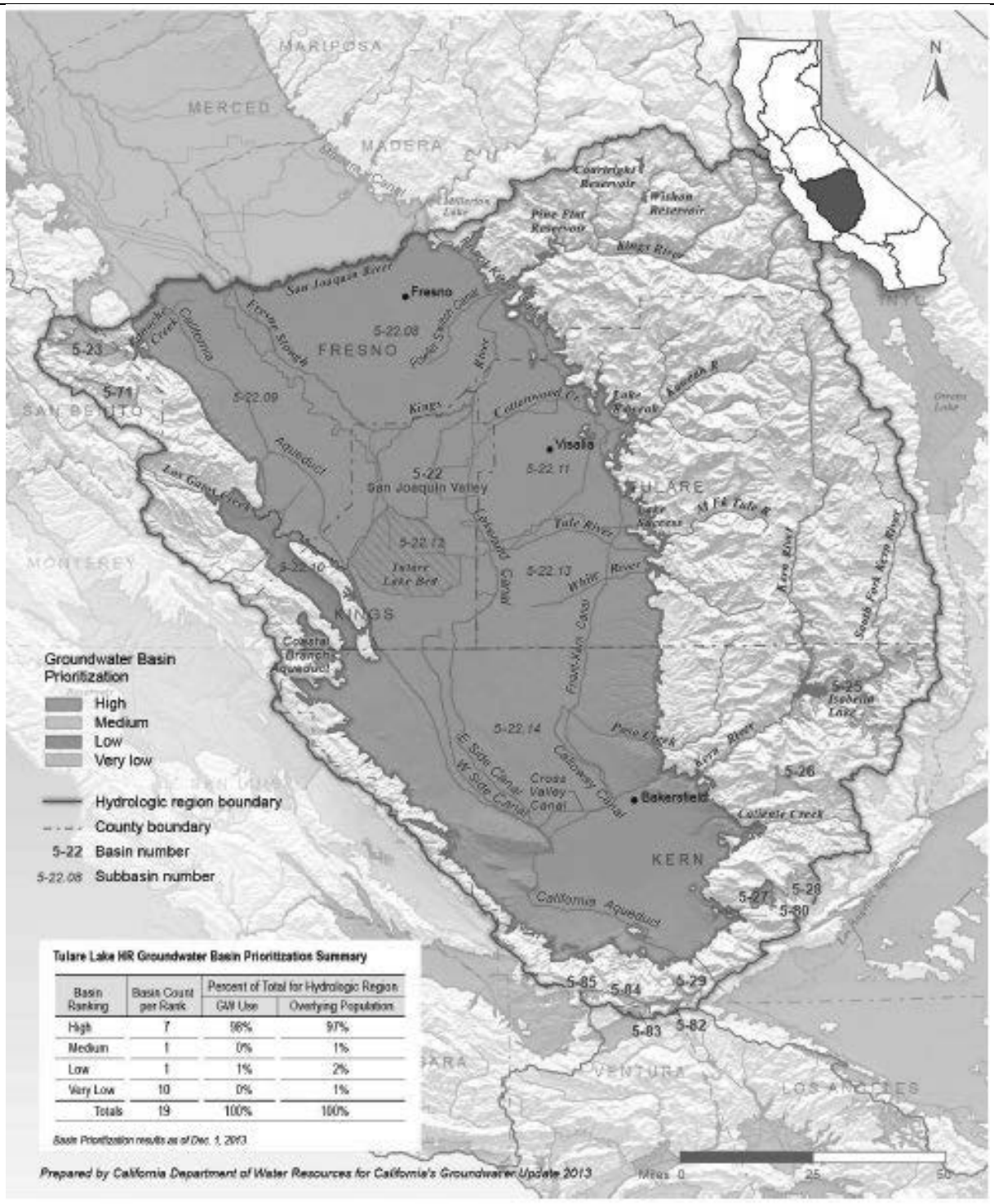


Figure 2-1
Tulare Lake Groundwater Basin Prioritization

2.3 - City of Fresno – 2020 UWMP

The proposed water for the Project is located within the City of Fresno Sphere of Influence. As such, the City has detailed information regarding groundwater in the area.

The City has an estimated service population of approximately 550,217 people. In 2020, approximately 121,993 acre-feet (39,752 million gallons) of water was delivered to an estimated 140,150 water service connections of which approximately 91% of the water use is for residential services. The remainder are for commercial and industrial uses.

The City currently utilizes local groundwater and surface water as its source of water supply. Groundwater is extracted by 270 wells located within the City's sphere of influence. In addition to production wells, the City has three surface water treatment facilities.

The Planning Documents

The following documents were essential to the development of this report:

- City of Fresno, 2020 Urban Water Management Plan, July 2021
- North Kings GSA Groundwater Sustainability Plan (GSP), December 2019
- Department of Water Resources Bulletin 118

SECTION 3 - WATER SUPPLY SUFFICIENCY

Water Code Section 10910, Section 4.5

…(c)(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single, dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

The sufficiency of the Project water supply is analyzed on two bases: the physical availability of the city to provide water in the amounts required for Project construction and operation; and the estimates (in the 2020 City of Fresno Urban Water Management Plan) of normal water years, single dry water year and multiple dry water years, water supply and demand-related water availability with respect to projected water demand during a 20-year projection. The city is a participant in the North Kings Groundwater Sustainability Agency (SKGSA) that adopted a GSP in December 2019. The 2020 Urban Water Management Plan is in compliance with the NKGSA GSPs.

3.1 - Physical Availability

The information regarding the physical availability of water at and near to the Project site supports the conclusion that the groundwater aquifer pumping history are sufficient for both Project construction and Project operation and that there will be sufficient water to serve project needs for 20 years under the water scenarios described below.

3.2 - The 2020 City of Fresno, Urban Water Management Plan – Water Years Adequacy Projections

The following text excerpted from the Urban Water Management Plan illustrates the total groundwater resources available to the City, and the projected usage demand on such supplies through 2045. The following text extract (Section 7.1.4 of the UWMP) explains the city water supply adequacy:

> *…the City is projected to have greater than 100,000 AF of available supply after meeting demands in normal years. The City's surface water supplies are reduced in a single dry year, but all potable demands are met and groundwater recharge of raw surface water is reduced. The City is projected to meet all demands during a five-year drought with its existing supplies. Potable demands are unrestricted, and non-potable water used for groundwater recharge is reduced in years three and four of a five-year drought.*

The following tables from the 2020 City of Fresno Urban Water Master Plan show the supply and demand comparisons for a normal year, single dry year, and five consecutive dry years.

3.2.1 - AVERAGE (OR NORMAL) YEAR

Normal year supply and demand projections and differences are presented in Table 3-1 (Table 7-1 in UWMP).

Table 3-1
Normal Year Supply and Demand Comparison (AF)

Table 7-1. Normal Year Supply and Demand Comparison (DWR 7-2R)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	60,000	60,000	60,000	60,000	60,000
Surface Water – FID	125,030	131,600	131,600	131,600	131,600
Recycled Water	5,910	5,910	5,910	5,910	5,910
SUPPLY TOTALS	**329,030**	**341,140**	**346,610**	**352,000**	**357,330**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable (Groundwater Recharge) Demand	62,700	65,400	68,100	70,800	73,500
DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
DIFFERENCE:	**129,826**	**128,384**	**124,300**	**120,124**	**115,883**

As shown in Table 3-1, future water supplies are anticipated to be met.

3.2.2 - SINGLE DRY YEAR

Projected supplies were compared to the increased demands for a single-dry year and are presented in Table 3-2 (Table 7-2 in UWMP).

Table 3-2
Retail: Single Dry Year Supply and Demand Comparison (AF)

Table 7-2. Single Dry Year Supply and Demand Comparison (DWR 7-3R)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	0	0	0	0	0
Surface Water – FID	45,852	45,852	45,852	45,852	45,852
Recycled Water	5,910	5,910	5,910	5,910	5,910
SUPPLY TOTALS	**189,852**	**195,392**	**200,862**	**206,252**	**211,582**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable (Groundwater Recharge) Demand	27,588	28,776	29,964	31,152	32,340
DEMAND TOTALS	**164,092**	**176,132**	**184,174**	**192,228**	**200,287**
DIFFERENCE:	**25,760**	**19,260**	**16,688**	**14,024**	**11,295**

As shown in Table 3-2, anticipated groundwater supplies are sufficient to meet all demands through the year 2045 even under single-year drought conditions.

3.2.3 - Five Consecutive Dry-Year Reliability Assessment

Projected supplies were compared to the increased demands for five-consecutive dry-year scenarios and are presented in Table 3-3 (Table 7-3 in UWMP).

Table 3-3
Retail: Five Consecutive Dry Years Supply and Demand Comparison (AF)

Table 7-3. Multiple Dry Years Supply and Demand Comparison (DWR 7-4R)

		2025	2030	2035	2040	2045
FIRST YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	30,000	30,000	30,000	30,000	30,000
	Surface Water – FID	99,725	99,725	99,725	99,725	99,725
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**273,725**	**279,265**	**284,735**	**290,125**	**295,455**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
	DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	DIFFERENCE:	**74,521**	**66,509**	**62,425**	**58,249**	**54,008**
SECOND YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	37,200	37,200	37,200	37,200	37,200
	Surface Water – FID	93,426	93,426	93,426	93,426	93,426
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**274,626**	**280,166**	**285,636**	**291,026**	**296,356**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
	DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	DIFFERENCE:	**75,422**	**67,410**	**63,326**	**59,150**	**54,909**
THIRD YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	0	0	0	0	0
	Surface Water – FID	73,568	73,568	73,568	73,568	73,568
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**217,568**	**223,108**	**228,578**	**233,968**	**239,298**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	53,763	46,281	43,526	40,677	37,761
	DEMAND TOTALS	**190,267**	**193,637**	**197,736**	**201,753**	**205,708**
	DIFFERENCE:	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**

		2025	2030	2035	2040	2045
FOURTH YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	0	0	0	0	0
	Surface Water – FID	45,852	45,852	45,852	45,852	45,852
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**189,852**	**195,392**	**200,862**	**206,252**	**211,582**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	26,047	18,564	15,810	12,960	10,045
	DEMAND TOTALS	**162,551**	**165,920**	**170,020**	**174,036**	**177,992**
	DIFFERENCE:	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
FIFTH YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	45,000	45,000	45,000	45,000	45,000
	Surface Water – FID	125,840	125,840	125,840	125,840	125,840
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**314,840**	**320,380**	**325,850**	**331,240**	**336,570**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
	DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	DIFFERENCE:	**115,636**	**107,624**	**103,540**	**99,364**	**95,123**

As shown in Table 3-3, anticipated groundwater supplies are sufficient to meet all demands through the year 2045 even under multiple-dry year drought conditions.

The long-term average day operational water demand will be for the residential users and is anticipated to be approximately 47.3 million gallons per year or 145.16 acre-feet per year for the total build out of the Project. This is based on each residential unit having an average day water demand of 693 gallons per day (based on the 198-gallon per capita/day average in the 2020 City of Fresno Urban Water Management Plan and 3.5 people per unit) across the entire buildout of 187 units for the Project.

The Project is within the City Sphere of Influence and growth within the Sphere of Influence is what the UWMP considered in growth from 2025 to 2045. The Project water demand is included in the projected increase in water demand of 42,243 AF from 2025 to 2045 (Table 3-3). The Project long-term operational water demand is 0.043% (145.16 AF/336,570 AF) of the available water supply in the city.

The tables and accompanying text indicate that the responsible water agency for the Project area has taken appropriate steps to assure that the total water supply for the service area will be adequate.

3.3 - Water Supply Management

California Water Resources has defined the Kings Subbasin as "critically overdrafted." Overdraft occurs where the average annual amount of groundwater extraction exceeds the long-term average annual supply of water to the basin. Sustainable yield is defined as the amount of groundwater pumping that can occur while maintaining groundwater at sustainable levels and avoiding undesirable results. The NKGSA GSP estimates the sustainable yield of the Kings Subbasin at 1,140,000 acre-feet/year. This results in a shortfall of approximately -122,000 acre-feet/year for the entire subbasin (20,800 acre-feet/year initial responsibility for the North Kings GSA).

The NKGSA, along with the other GSAs in the Kings Basin, have determined the overdraft responsibility for each of the GSAs in the Subbasin by estimating their "groundwater impact," which is essentially their groundwater pumping minus any natural and artificial forms of recharge.

According to the NKGSA's GSP, there are several projects within the City of Fresno's geographic area that may be implemented to offset a portion of the GSA's groundwater extraction and eliminate long term overdraft of the Kings subbasin. According to the GSP, each project with be implemented either by the City of Fresno or the GSA. The projects will primarily help stabilize groundwater levels and increase the amount of groundwater in storage. Additionally, the projects can also provide groundwater quality benefits and/or reduce land subsidence. The GSP estimates that these projects would yield an estimated average annual volume of approximately 200,000 acre-feet/year if fully implemented as envisioned.

The Project is accounted for in the UWMP and the UWMP is in agreement with the NKGSA GSP. Because of this, the Project water demand is available from the groundwater in the area.

SECTION 4 - CONCLUSIONS

This Water Supply Assessment has provided the data and analysis needed to verify that a sufficient Project water supply is physically available (Section 3.1) by the end of 2025, and that the Project water supply is in accord with SB 610's normal year/dry year/multiple dry year requirements, sufficient (Section 3.2).

It is recommended that the City of Fresno conclude that the proposed water supplies for the Project be found sufficient to meet the projected Project water demands.

SECTION 5 - REFERENCES

2003. Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001. (online): http://www.water.ca.gov/pubs/use/sb_610_sb_221_guidebook/guidebook.pdf. Accessed February 1, 2021

California Department of Water Resources (DWR). 2015. California's Groundwater Bulletin 118.135 p.

City of Fresno, 2020 Urban Water Management Plan

APPENDIX A

CHAPTER 643, STATUTES OF 2001 (SENATE BILL 610)

Senate Bill No. 610
CHAPTER 643

An act to amend Section 21151.9 of the Public Resources Code, and to amend Sections 10631, 10656, 10910, 10911, 10912, and 10915 of, to repeal Section 10913 of, and to add and repeal Section 10657 of, the Water Code, relating to water.

[Filed with Secretary of State October 09, 2001. Approved by Governor October 09, 2001.]

LEGISLATIVE COUNSEL'S DIGEST

SB 610, Costa. Water supply planning.

(1) Existing law requires every urban water supplier to identify, as part of its urban water management plan, the existing and planned sources of water available to the supplier over a prescribed 5-year period. Existing law prohibits an urban water supplier that fails to prepare or submit its urban water management plan to the Department of Water Resources from receiving drought assistance from the state until the plan is submitted.

This bill would require additional information to be included as part of an urban water management plan if groundwater is identified as a source of water available to the supplier. The bill would require an urban water supplier to include in the plan a description of all water supply projects and programs that may be undertaken to meet total projected water use. The bill would prohibit an urban water supplier that fails to prepare or submit the plan to the department from receiving funding made available from specified bond acts until the plan is submitted. The bill, until January 1, 2006, would require the department to take into consideration whether the urban water supplier has submitted an updated plan, as specified, in determining eligibility for funds made available pursuant to any program administered by the department.

(2) Existing law, under certain circumstances, requires a city or county that determines an environmental impact report is required in connection with a project, as defined, to request each public water system that may supply water for the project to assess, among other things, whether its total projected water supplies will meet the projected water demand associated with the proposed project. Existing law requires the public water system to submit the assessment to the city or county not later than 30 days from the date on which the request was received and, in the absence of the submittal of an assessment, provides that it shall be assumed that the public water system has no information to submit. Existing law makes legislative findings and declarations concerning "Proposition C," a measure approved by the voters of San Diego County relating to regional growth management, and provides that the procedures established by a specified review board established in connection with that measure are deemed to comply with the requirements described above relating to water supply planning by a city or county.

This bill would revise those provisions. The bill, instead, would require a city or county that determines a project is subject to the California Environmental Quality Act to identify any public water system that may supply water for the project and to request those public water systems to

prepare a specified water supply assessment, except as otherwise specified. The bill would require the assessment to include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts. The bill would require the city or county, if it is not able to identify any public water system that may supply water for the project, to prepare the water supply assessment after a prescribed consultation. The bill would revise the definition of "project," for the purposes of these provisions, and make related changes.

The bill would prescribe a timeframe within which a public water system is required to submit the assessment to the city or county and would authorize the city or county to seek a writ of mandamus to compel the public water system to comply with requirements relating to the submission of the assessment.

The bill would require the public water system, or the city or county, as applicable, if that entity concludes that water supplies are, or will be, insufficient, to submit the plans for acquiring additional water supplies.

The bill would require the city or county to include the water supply assessment and certain other information in any environmental document prepared for the project pursuant to the act. By establishing duties for counties and cities, the bill would impose a state-mandated local program.

The bill would provide that the County of San Diego is deemed to comply with these water supply planning requirements if the Office of Planning and Research determines that certain requirements have been met in connection with the implementation of "Proposition C."

(3) The bill would incorporate additional changes in Section 10631 of the Water Code proposed by AB 901, to be operative only if this bill and AB 901 are enacted and become effective on or before January 1, 2002, each bill amends Section 10631 of the Water Code, and this bill is enacted last.
(4) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

DIGEST KEY

BILL TEXT

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1.

(a) The Legislature finds and declares all of the following:

(1) The length and severity of droughts in California cannot be predicted with any accuracy.

(2) There are various factors that affect the ability to ensure that adequate water supplies are available to meet all of California's water demands, now and in the future.

(3) Because of these factors, it is not possible to guarantee a permanent water supply for all water users in California in the amounts requested.

(4) Therefore, it is critical that California's water agencies carefully assess the reliability of their water supply and delivery systems.

(5) Furthermore, California's overall water delivery system has become less reliable over the last 20 years because demand for water has continued to grow while new supplies have not been developed in amounts sufficient to meet the increased demand.

(6) There are a variety of measures for developing new water supplies including water reclamation, water conservation, conjunctive use, water transfers, seawater desalination, and surface water and groundwater storage.

(7) With increasing frequency, California's water agencies are required to impose water rationing on their residential and business customers during this state's frequent and severe periods of drought.

(8) The identification and development of water supplies needed during multiple-year droughts is vital to California's business climate, as well as to the health of the agricultural industry, environment, rural communities, and residents who continue to face the possibility of severe water cutbacks during water shortage periods.

(9) A recent study indicates that the water supply and land use planning linkage, established by Part 2.10 (commencing with Section 10910) of Division 6 of the Water Code, has not been implemented in a manner that ensures the appropriate level of communication between water agencies and planning agencies, and this act is intended to remedy that deficiency in communication.

(b) It is the intent of the Legislature to strengthen the process pursuant to which local agencies determine the adequacy of existing and planned future water supplies to meet existing and planned future demands on those water supplies.

SEC. 2.

Section 21151.9 of the Public Resources Code is amended to read:

21151.9.

Whenever a city or county determines that a project, as defined in Section 10912 of the Water Code, is subject to this division, it shall comply with Part 2.10 (commencing with Section 10910) of Division 6 of the Water Code.

SEC. 3.

Section 10631 of the Water Code is amended to read:

10631.

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments as described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments as described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of such savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single dry, and multiple dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

SEC. 3.5.

Section 10631 of the Water Code is amended to read:

10631.

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments as described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that

characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments as described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed

description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single dry, and multiple dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

SEC. 4.

Section 10656 of the Water Code is amended to read:

10656.

An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

SEC. 4.3.

Section 10657 is added to the Water Code, to read:

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

SEC. 4.5.

Section 10910 of the Water Code is amended to read:

10910.

(a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site.

(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

(d) (1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.

(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

(A) Written contracts or other proof of entitlement to an identified water supply.

(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water

systems or water service contractholders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water supply assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

(g) (1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

(2) Prior to the expiration of the 90-day period, if the public water system intends to request an extension of time to prepare and adopt the assessment, the public water system shall meet with the city or county to request an extension of time, which shall not exceed 30 days, to prepare and adopt the assessment.

(3) If the public water system fails to request an extension of time, or fails to submit the assessment notwithstanding the extension of time granted pursuant to paragraph (2), the city or county may seek a writ of mandamus to compel the governing body of the public water system to comply with the requirements of this part relating to the submission of the water supply assessment.

(h) Notwithstanding any other provision of this part, if a project has been the subject of a water supply assessment that complies with the requirements of this part, no additional water supply assessment shall be required for subsequent projects that were part of a larger project for which a water supply assessment was completed and that has complied with the requirements of this part and for which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has concluded that its water supplies are sufficient to meet the projected water demand associated with the proposed project, in addition to the existing and planned future uses, including, but not limited to, agricultural and industrial uses, unless one or more of the following changes occurs:

(1) Changes in the project that result in a substantial increase in water demand for the project.

(2) Changes in the circumstances or conditions substantially affecting the ability of the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), to provide a sufficient supply of water for the project.

(3) Significant new information becomes available which was not known and could not have been known at the time when the assessment was prepared.

SEC. 5.

Section 10911 of the Water Code is amended to read:

10911.

(a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:

(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.

(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.

(3) Based on the considerations set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to be able to acquire additional water supplies.

(b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.

(c) The city or county may include in any environmental document an evaluation of any information included in that environmental document provided pursuant to subdivision (b). The city or county shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses. If the city or county determines that water supplies will not be sufficient, the city or county shall include that determination in its findings for the project.

SEC. 6.

Section 10912 of the Water Code is amended to read:

10912.

For the purposes of this part, the following terms have the following meanings:

(a) "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

(b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.

(c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3000 or more service connections. A public water system includes all of the following:

(1) Any collection, treatment, storage, and distribution facility under control of the operator of the system which is used primarily in connection with the system.

(2) Any collection or pretreatment storage facility not under the control of the operator that is used primarily in connection with the system.

(3) Any person who treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.

SEC. 7.

Section 10913 of the Water Code is repealed.

SEC. 8.

Section 10915 of the Water Code is amended to read:

10915.

The County of San Diego is deemed to comply with this part if the Office of Planning and Research determines that all of the following conditions have been met:

(a) Proposition C, as approved by the voters of the County of San Diego in November 1988, requires the development of a regional growth management plan and directs the establishment of a regional planning and growth management review board.

(b) The County of San Diego and the cities in the county, by agreement, designate the San Diego Association of Governments as that review board.

(c) A regional growth management strategy that provides for a comprehensive regional strategy and a coordinated economic development and growth management program has been developed pursuant to Proposition C.

(d) The regional growth management strategy includes a water element to coordinate planning for water that is consistent with the requirements of this part.

(e) The San Diego County Water Authority, by agreement with the San Diego Association of Governments in its capacity as the review board, uses the association's most recent regional growth forecasts for planning purposes and to implement the water element of the strategy.

(f) The procedures established by the review board for the development and approval of the regional growth management strategy, including the water element and any certification process established to ensure that a project is consistent with that element, comply with the requirements of this part.

(g) The environmental documents for a project located in the County of San Diego include information that accomplishes the same purposes as a water supply assessment that is prepared pursuant to Section 10910.

SEC. 9.

Section 3.5 of this bill incorporates amendments to Section 10631 of the Water Code proposed by both this bill and AB 901. It shall only become operative if (1) both bills are enacted and become effective on or before January 1, 2002, (2) each bill amends Section 10631 of the Water Code, and (3) this bill is enacted after AB 901, in which case Section 3 of this bill shall not become operative.

SEC. 10.

No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because a local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the program or level of service mandated by this act, within the meaning of Section 17556 of the Government Code.

APPENDIX B

2020 CITY OF FRESNO, URBAN WATER MANAGEMENT PLAN

City of FRESNO
Department of Public Utilities

2020 Urban Water Management Plan

Final

JULY 2021 | CITY OF FRESNO



Photo Credit: Downtown Fresno Partnership

City of FRESNO
Department of Public Utilities

CITY OF FRESNO

Final 2020 Urban Water Management Plan

JULY 2021



Prepared by Water Systems Consulting, Inc.

WSC

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ACRONYMS & ABBREVIATIONS

°F	degrees Fahrenheit
1,2,3-TCP	1,2,3-trichloropropane
AF	acre-feet
AFY	acre-feet per year
AMI	advanced metering infrastructure
AWE	Alliance for Water Efficiency
AWWA	American Water Works Association
BP04	Booster Pump 4
CII	Commercial, Institutional, and Industrial
CIMIS	California Irrigation Management Information System
City	City of Fresno
COG	Council of Governments
CPC	California Plumbing Code
CSUF	California State University Fresno
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVWAC	Central Valley Water Awareness Committee
CWC	California Water Code
CY	Calendar Year
DBCP	1,2-dibromo-3-chloropropane
DMM	Demand Management Measures
DDW	Department of Drinking Water
DPU	Department of Public Utilities
DRA	Drought Risk Assessment
DWR	Department of Water Resources
EDB	ethylene dibromide or 1,2-dibromoethane
ETo	Evapotranspiration
FID	Fresno Irrigation District
FMFCD	Fresno Metropolitan Flood Control District
GIS	Geographic Information System
GPCD	gallons per capita per day
GSA	Groundwater Sustainability Agency

GSP	Groundwater Sustainability Plan
HCF	hundred cubic feet
IGSM	Integrated Groundwater and Surface Water Model
Metro Plan	Fresno Metropolitan Water Resource Management Plan
mgd	million gallons per day
NESWTF	Northeast Surface Water Treatment Facility
NFWRF	North Fresno Wastewater Reclamation Facility
NKGSP	North Kings Groundwater Sustainability Plan
NRDC	Natural Resources Defense Council
PCE	perchloroethylene or tetrachloroethylene
PEIR	Programmatic Environmental Impact Report
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
RHNA	Regional Housing Needs Allocation
RWMP	Recycled Water Master Plan
RWRF	Regional Wastewater Reclamation Facility
SB	Senate Bill
SBx7-7	Senate Bill x 7-7
SESWTF	Southeast Surface Water Treatment Facility
SGMA	Sustainable Groundwater Management Act
SOI	Sphere of Influence
sq mi	square miles
SWTF	Surface Water Treatment Facility
T-3 SWTF	T-3 Water Storage and Modular Surface Water Treatment Facility
TCE	trichloroethylene
TDS	total dissolved solids
TTDF	Tertiary Treatment and Disinfection Facility
USBR	United States Bureau of Reclamation
UV	ultraviolet
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
WSCP	Water Shortage Contingency Plan
WSIP	Water Storage Investment Program
WY	Water Year

CITY OF FRESNO

Executive Summary

This section summarizes the 2020 Urban Water Management Plan (UWMP) for the City of Fresno (City). It provides a lay description of the 2020 UWMP in a manner that is accessible to non-technical readers. This summary describes the fundamental purposes of the UWMP, including water service reliability, future challenges, and strategies for managing water reliability risks.

UWMPs are updated every five years and outline each suppliers' long-term water resource planning to ensure there is enough water to meet both existing and future demands. They set the roadmap for how the City will use water over the coming years.

The original Fresno water system began operations in 1876 as a non-profit organization established by a group of public-minded citizens. Today, the City covers approximately 115 square miles (sq mi) (73,500 acres) consisting largely of single-family residential, commercial, public, and industrial development. The City's General Plan projects buildout of the 106,000 acres planning area in 2056. This UWMP addresses the City's water service reliability, future challenges, and strategies for managing risks to water reliability through 2045. The City's Fresno Metropolitan Water Resource Management Plan (Metro Plan), which is currently being prepared, addresses a 50-year horizon – through 2070.

IN THIS SECTION

- Service Area Description
- Water Use
- Water Sources
- Water Supply Reliability

Purpose and Organization of the Plan

This plan comprises the 2020 UWMP for the City, as required by the California Urban Water Management Planning Act, which requires all urban water suppliers with more than 3,000 connections or distributing more than 3,000 acre-feet per year (AFY) to complete an UWMP every five years. As of the close of the 2020 calendar year, the City has over 139,500 residential, commercial, industrial, and institutional water service connections and produced nearly 122,000 acre-feet (AF) of water. As a result, the City is required to prepare and adopt an UWMP and submit it to the Department of Water Resources (DWR) by the July 1, 2021, due date.

Requirements for the UWMP include:

- Assessment of current and projected water supplies
- Evaluation of demand and customer types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan, in the event of a water shortage
- Comparison of demand and supply projections

The UWMP is a valuable planning document used for multiple purposes:

- Serves as a valuable resource to the community and other interested parties regarding water supply and demand, conservation, and water related information
- Meets a statutory requirement of the California Water Code (CWC)
- Provides a key source of information for water supply assessments and written verifications of water supply
- Supports regional long-range planning, including City and County General Plans
- Provides a standardized methodology for water utilities to assess their water resource needs and availability
- Provides a resource for regional involvement in the California Water Plan
- Provides for a plan during water drought situations

Outreach and Engagement

The City has coordinated the preparation of its 2020 UWMP with its water suppliers, Fresno County, the City of Clovis, nearby water agencies, and community members to develop a UWMP that adheres to the requirements of the CWC and plans for a resilient water future. In total, the City has coordinated preparation of the 2020 UWMP and solicited participation and comments with the following agencies**:**

- Bakman Water Company
- City of Clovis
- County of Fresno
- Fresno Irrigation District
- Fresno Metropolitan Flood Control District
- Friant Water Authority
- Garfield Water District
- Malaga County Water District
- Pinedale County Water District
- North Kings Groundwater Sustainability Agency
- US Bureau of Reclamation

Service Area Description

The City's General Plan planning area covers approximately 106,000 acres comprised of approximately 73,500 acres of incorporated land and 32,500 acres of unincorporated land. The City's water service area covers 70,400 acres consisting largely of single-family residential, commercial, public, and industrial development, shown in **Figure ES-6** (located at the end of the Executive Summary). The service area excludes areas served by the Bakman Water Company, Pinedale County Water District, Park Van Ness Mutual Water Company, California State University Fresno, and private groundwater users located within Fresno County islands. The City will eventually serve out to the Sphere of Influence (SOI) boundary adopted in the 2014 General Plan and includes all lands planned to be annexed by the City at the projected 2056 buildout of the General Plan, summarized in **Table ES-1**.

Table ES-1. Existing and Future Water Service Area

LAND USE CATEGORY	2020 WATER SERVICE AREA		2056 WATER SERVICE AREA	
	ACRES	PERCENT	ACRES	PERCENT
Single-Family Residential	27,700	39.3%	40,000	47.4%
Multifamily Residential	3,700	5.3%	3,800	4.5%
Commercial	4,500	6.4%	8,600	10.2%
Public Facility	5,600	8.0%	7,200	8.5%
Industrial	4,500	6.4%	9,300	11.0%
Open Space/ Landscape Irrigation	13,100	18.6%	11,000	13.0%
Mixed Use	0	0%	3,900	4.6%
Downtown	0	0%	600	0.7%
Vacant / Partially Vacant	11,300	15.9%	0	0%
TOTAL	**70,400**	**100%**	**84,400**	**100%**

Note: Acreage from City GIS Shapefile of Land Uses and aligns with the General Plan for buildout in year 2056.

Population Projections

The City experienced rapid growth since it was founded by the Central Pacific Railroad in 1872 up through the mid-1990s, when the City's annual growth rate was typically greater than 2%. From 1995 to 2015, the annual growth rate has decreased to an average of 1.3%, and since 2015, the rate has not surpassed 1.0%. Achieving General Plan buildout population estimates requires an average annual growth rate of 1.44% from 2020 to 2056. The City's water service area population is anticipated to continue to grow along with the City, with some slightly higher growth years anticipated in the next 10 years due to multiple large developments planned for completion in the near term. As a result, population growth, shown in **Figure ES-1** on the following page, occurs at an annual rate of ranging from 1.1–2.1% between 2020 and 2056.

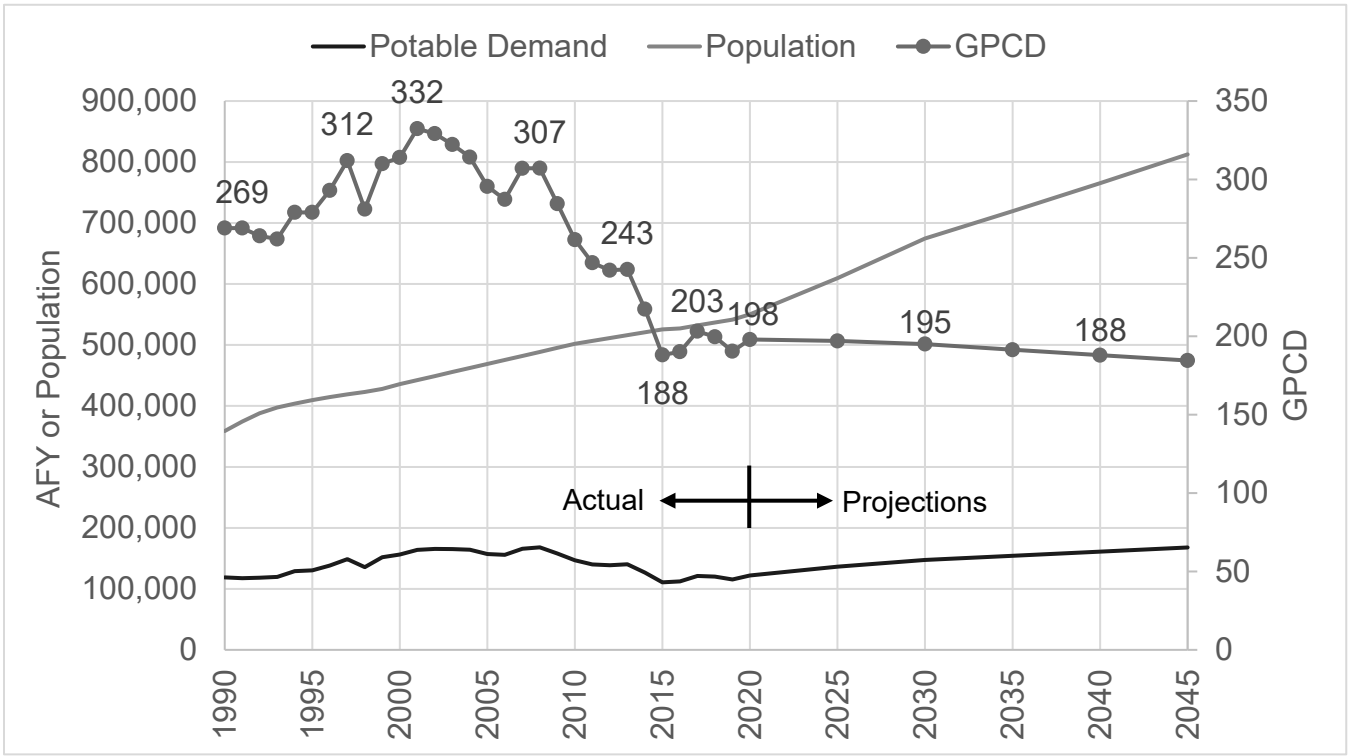
Water Use

Water consumption in the City is characterized by the typical demand sectors of residential, commercial, institutional, industrial, and irrigational. The difference between production and consumption is losses, which may be attributed to system leaks, meter inaccuracies, fire flows, theft, unmetered use, or other factors.

As shown in **Figure ES-1**, the City's water demand has decreased even as the City has grown over the past several decades, and demands are projected to grow slower than population growth. This trend is captured by the City's daily per capita water use, measured as gallons per capita per day (GPCD). For 2020, the City's water use averaged 198 GPCD based on 121,993 AF of water production and a service area population of 550,217. The City is far below its 2020 daily per capita water use target of 247 GPCD due to the extensive conservation efforts implemented by the City in the past decade.

The City also diverts raw surface water obtained from the United States Bureau of Reclamation (USBR) and the Fresno Irrigation District (FID) to recharge basins throughout the service area. The City coordinates with FID for the delivery of the recharge water, utilizing FID's existing system of channels and pipelines to covey the raw water, and with Fresno Metropolitan Flood Control District (FMFCD) to deliver water to FMFCD's stormwater retention and recharge basins or the City's own recharge basins. The raw surface water recharges the groundwater basin to sustain the groundwater supply for the City. The groundwater recharge volume can vary based on surface water supply availability and is represented as an addition to annual groundwater supplies. In addition, the City serves a limited number of customers secondary treated or tertiary treated and disinfected recycled water for agricultural irrigation or landscape irrigation, respectively.

Figure ES-1. City of Fresno Demand Projections



The City's per capita water usage is projected to continue to decline through 2045 due to more water efficiency in future construction and passive conservation; however, due to the increase in population the demand is expected to slowly increase in the next 25 years. The potable demand projections for normal water use are based on land use where future land use areas are expected to be more water efficient than existing land uses and buildings due to the California Plumbing Code (CPC) and use of higher efficiency appliances and landscapes. Demand for existing land uses is also expected to slowly reduce over time due to passive conservation, which includes the replacement of older water fixtures and appliances with more efficient types now required as part of the CPC.

Water Sources

The City relies on groundwater from the North Kings Subbasin; surface water from Central Valley Project (CVP), through a contract with the USBR; Kings River water, through a contract with FID; and recycled water. Water production in the City has consisted of 100% groundwater prior to the commissioning of the City's first surface water treatment facility (SWTF) in 2004. Since 2004, the City has invested in expanding its surface water treatment capabilities and now has three SWTFs that provide approximately half of all potable water demands in the service area.

Groundwater

The City overlies the Kings Subbasin, which is part of the greater San Joaquin Valley Groundwater Basin. The City is one of many water purveyors that use groundwater from the Kings Subbasin. The City has a network of over 270 municipal wells and currently operates approximately 202 municipal supply wells within the Kings Subbasin.

The City was a founding member of the North Kings Groundwater Sustainability Agency (North Kings GSA), which was formed following passage of the Sustainable Groundwater Management Act (SGMA) of 2014. This legislation created a statutory framework for groundwater management in California that can be sustained during the planning and implementation horizon without causing undesirable results. SGMA requires governments and water agencies of "critically overdrafted" basins to reach sustainability by 2040. The Kings Subbasin was designated a critically overdrafted basin by DWR and the North Kings GSA is working within the SGMA framework to reach groundwater sustainability.

Due to the City's investments in other supplies – surface water, recycled water, and conservation – groundwater levels beneath the City have already begun to recover from low levels experienced during the recent drought. The City plans to continue to use groundwater within a larger conjunctive use program that maximizes its existing water rights and surface water supply sources.

Surface Water

With the completion and operation of the Southeast Surface Water Treatment Facility (SESWTF), surface water is now a primary water supply used to meet potable demands within the City. The City contracts with FID for Kings River water and with USBR for CVP water from the Friant-Kern Canal. The surface water supply is used either for potable uses through treatment and distribution or delivery to recharge basins for groundwater recharge. The City has historically not used all its available FID allocation in any given year, although it pays a flat rate for its total allocation regardless of use. Water unused by the City is reallocated by FID to its other customers.

The City, through an agreement originally executed in 1961, secured a surface water supply from USBR CVP Friant Division for an annual water supply of 60,000 AF of Class 1 water. The agreement was last renewed in 2010 as a Section 9(d) contract that provides water from the San Joaquin River in perpetuity. Class 1 water has historically been very reliable until the 2006 San Joaquin River Restoration Settlement Agreement, which ended an 18-year legal dispute over the operation of Friant Dam brought by a coalition of conservation and fishing groups. The projected surface water available for the City from USBR is based on USBR simulations for the 2006 Settlement Agreement. Average simulated delivery is 53,680 AFY and the median simulated delivery is 60,000 AFY. However, very dry years have previously resulted in substantial reductions as demonstrated by the zero allocations that occurred in 2014 and 2015.

FID is one of 28 agencies that receives an entitlement of water from the Kings River through the Kings River Water Association. The City executed its most recent agreement with FID in 2016. The 2016 agreement identifies the City's contracted percentage of FID's Kings River water based on the City's water service area located within FID service area as a percentage of the FID land area. FID land area varies slightly every year because it is dependent on the acreage receiving water deliveries for that year rather than the total acreage within FID, and is roughly 200,000 acres. As the City incorporates new users and the water service area expands, the percentage of FID supply increases. However, the 2016 FID Agreement sets the City's maximum percentage of FID's Kings River water as 29.0%, which is expected to be reached between 2025 and 2030.

The City's potential supply from FID was projected using actual Kings River deliveries for 1964–2019. The average FID Kings River delivery over that time was 452,541 AF, which equates to an average potential City supply of 131,237 AF, assuming the maximum 29.0% City supply percentage. The projected City percentage of FID supplies was estimated based on City's water service area growth projections through buildout in 2056.

Recycled Water

The Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) has developed from what was once a sewer farm to what is now a state-of-the-art wastewater treatment facility. The RWRF treats flows from not only the City, but also sewered County areas (some county areas remain unsewered), the City of Clovis, Pinedale County Water District, and Pinedale Public Utility District. Flows received at this facility peaked at 81,100 AF in 2006 and have been steadily decreasing since, with the average influent flow about 63,000 AF over the last five years.

The City has three primary means of effluent disposal from the RWRF:

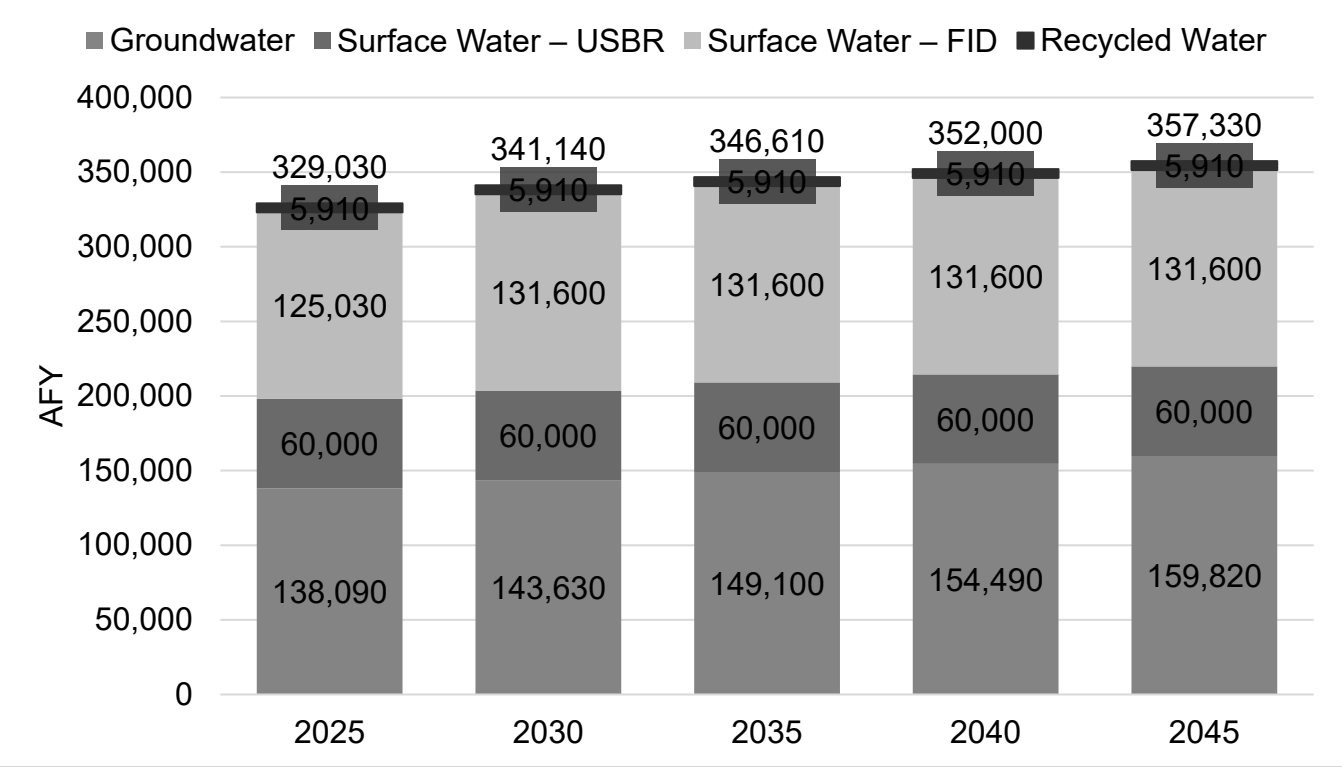
1. Undisinfected secondary effluent to on-site and off-site farmland for restricted irrigation
2. Undisinfected secondary effluent to percolation ponds
3. Disinfected tertiary effluent to the recycled water distribution system

The percolated effluent has been deemed equivalent to tertiary treated water by the State and the City has been extracting this water for reuse in areas within and surrounding the RWRF, as well as to FID's canals, through an exchange agreement for delivery to FID agricultural customers. The City recently constructed the Tertiary Treatment and Disinfection Facility (TTDF) at the RWRF and has constructed most of the southwest recycled water system, which is projected to increase deliveries from roughly 1,000 AFY today to eventually meet 5,800 AFY of non-potable demands. In addition, the City uses recycled water from the North Fresno Wastewater Reclamation Facility (NFWRF) to irrigate Copper River Ranch Golf Course.

Summary of Supplies

The City currently balances its surface water supplies and groundwater based on minimum production for operation of the SWTFs and minimum groundwater pumping to manage and control contamination plumes and prevent their spread. The minimum operation conditions typically occur in the low-demand winter months, and the City can increase surface water production during peak demand months when surface water is available. In normal and wet years, the City intends to rely on more surface water supply and recharge raw surface water to replenish the groundwater basin and build storage for dry years. In dry years, when surface water is less available, the City will ramp up well production to meet demands. The City is expected to continue this supply management strategy in the future. **Figure ES-2** shows the City's annual average projected water supplies through 2045.

Figure ES-2. Projected Water Supplies



Water Supply Reliability

The City currently manages its surface water and groundwater supply by maximizing surface water for potable use and intentional recharge during wet and normal years, while relying on groundwater during dry years. The City is currently updating its Metro Plan, which will recommend projects and programs to optimize the use of its supply portfolio and further improve supply resilience. Supply management tools are an expected outcome of the Metro Plan update; however, the City's ongoing supply management is intended to maximize local supplies and improve the groundwater basin storage. Current actions include enhanced groundwater management and intentional recharge, increased recycled water use, and continued conservation through the implementation of demand management measures.

Normal water year, single dry water year, and five-year consecutive drought period supply projections were made based on historic water allocations for surface water supplies, sustainable yield for groundwater, and projected utilization for recycled water. For surface water, the single dry year is based on 2015 allocations and the five-year drought is based on 2012 to 2016. Groundwater supplies, due to intentional recharge augmentation, remain reliable in all hydrologic conditions.

Despite severe reductions of surface water supplies during recent dry years, sufficient good-quality water was available to operate the SWTFs. The projected supplies and demands for a normal year, single dry year, and five-year consecutive drought, shown in **Figure ES-3** through **Figure ES-5** on the next page and in **Table 7-1** through **Table 7-3** in **Section 7.1.4**, demonstrate that the City is projected to have greater than 100,000 AF of available supply after meeting demands in normal years; the City's surface water supplies are reduced in a single dry year, but all potable demands are met and groundwater recharge of raw surface water is reduced; and the City is projected to meet all demands during a five-year drought with its existing supplies with reduced groundwater recharge in years three and four of a five-year drought to accommodate low surface water allocations.

Managed recharge of surface water is an essential component of the City's groundwater supply and the City must average 60,000 AFY to 70,000 AFY of recharge with surface water to meet the projections. This highlights the City's priority of recharging available surface water in the coming years.

Figure ES-3. Normal Year Supply vs. Demand

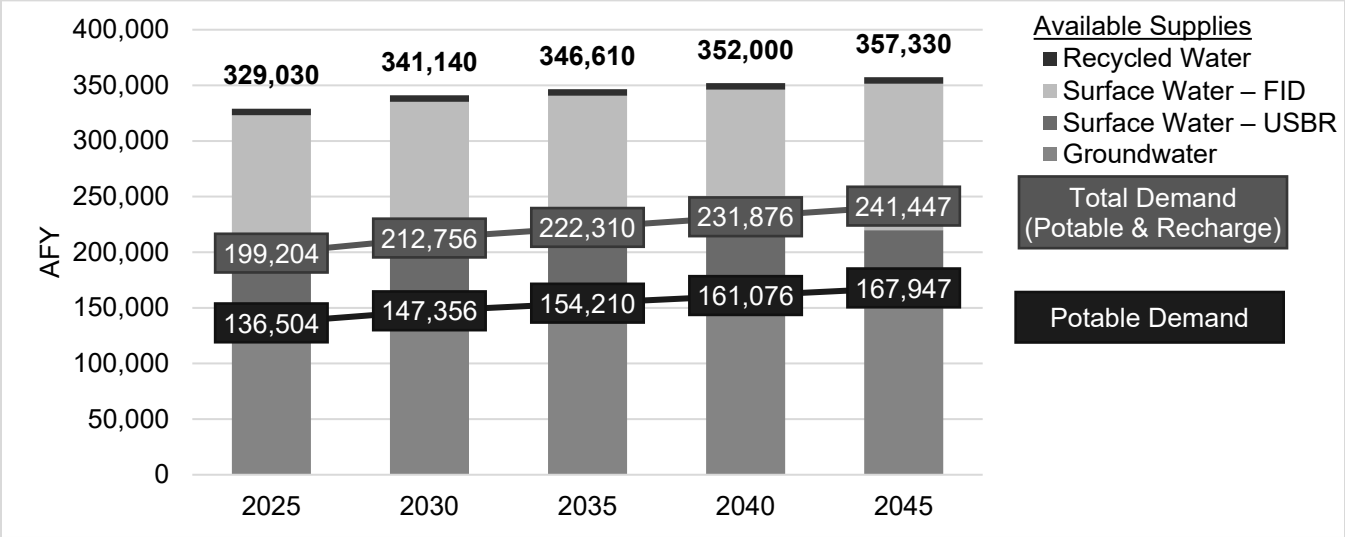


Figure ES-4. Single Dry Year Supply vs. Demand

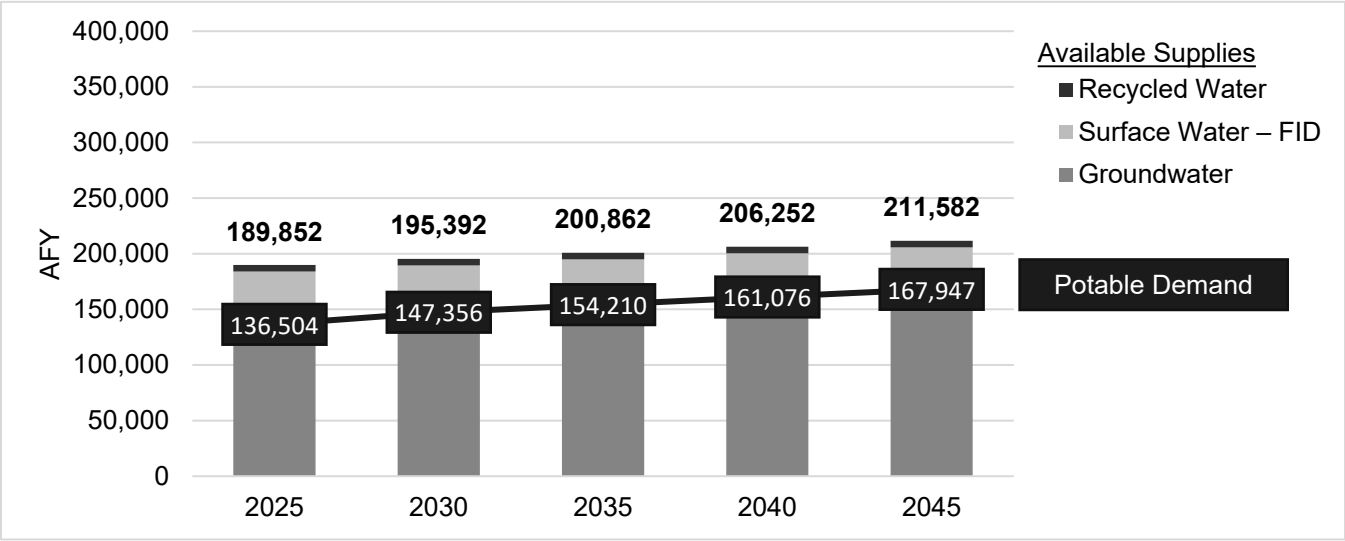
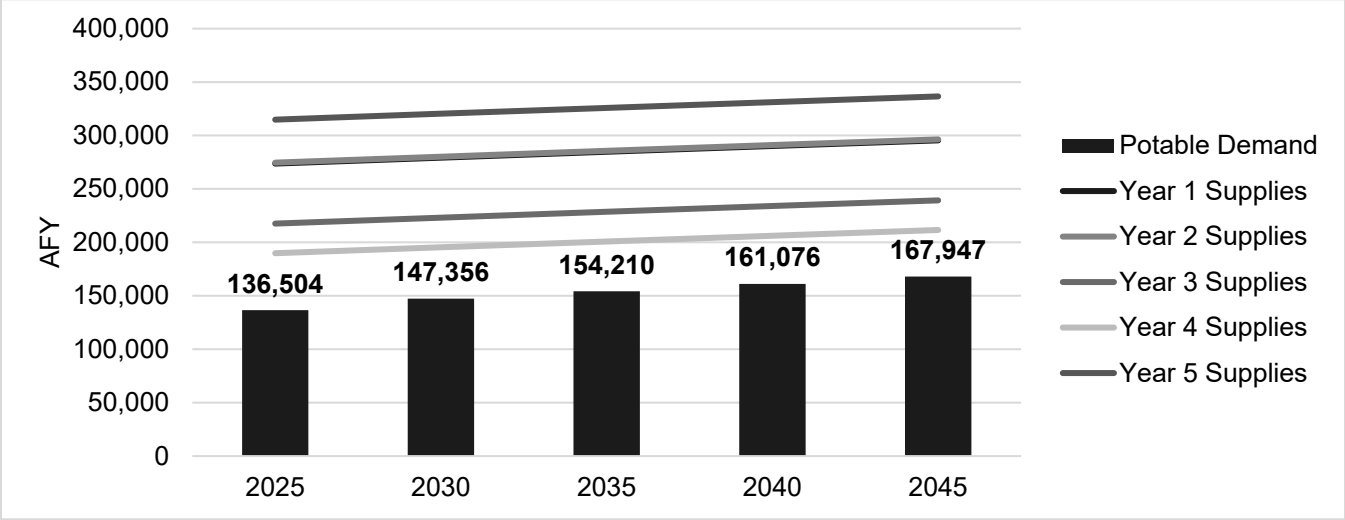


Figure ES-5. Multiple Dry Years Supply vs. Demand



2021-2025 Drought Risk Assessment

A new provision of the Water Code directs Suppliers to prepare a Drought Risk Assessment (DRA), assuming a drought period lasting five consecutive years, starting from the year following the year when the assessment is conducted. The DRA analysis allows the City to examine the management of its supplies during stressed hydrologic conditions and an opportunity to evaluate whether the City may need to enact its Water Shortage Contingency Plan (WSCP) during the next actual drought period lasting at least five years. The projected gross water use for the five-year DRA is based on unrestricted potable demand, a reduction in raw-water demand for intentional recharge in years three and four of the five-year drought, and unrestricted recycled water demand. Surface water supply availability is based on actual allocations during the previous drought – from 2012 to 2016.

Table ES-2 compares the total projected supply and demand for the five-year DRA for 2021 through 2025. As shown, the City does not expect to enact its WSCP for a five-consecutive-year drought based on the unrestricted potable demand projections and the reliability of the current supply portfolio. Available surface water supplies during this period would be utilized for groundwater recharge to sustain the groundwater basin.

Table ES-2. Five-Year Drought Risk Assessment

WATER USE TYPE	2021	2022	2023	2024	2025
Groundwater	133,602	134,724	135,846	136,968	138,090
Surface Water – USBR	30,000	37,200	0	0	45,000
Surface Water – FID	93,354	83,085	65,425	40,776	111,911
Recycled Water	1,912	2,911	3,911	4,910	5,910
TOTAL SUPPLY	**258,868**	**257,920**	**205,181**	**182,655**	**300,911**
Potable Demand	124,910	127,827	130,745	133,662	136,504
Non-Potable Demand	60,000	60,000	48,287	22,260	60,000
TOTAL DEMAND	**184,910**	**187,827**	**179,032**	**155,922**	**196,504**
AVAILABLE SUPPLIES	**73,958**	**70,093**	**26,149**	**26,732**	**104,407**

Water Shortage Contingency Plan

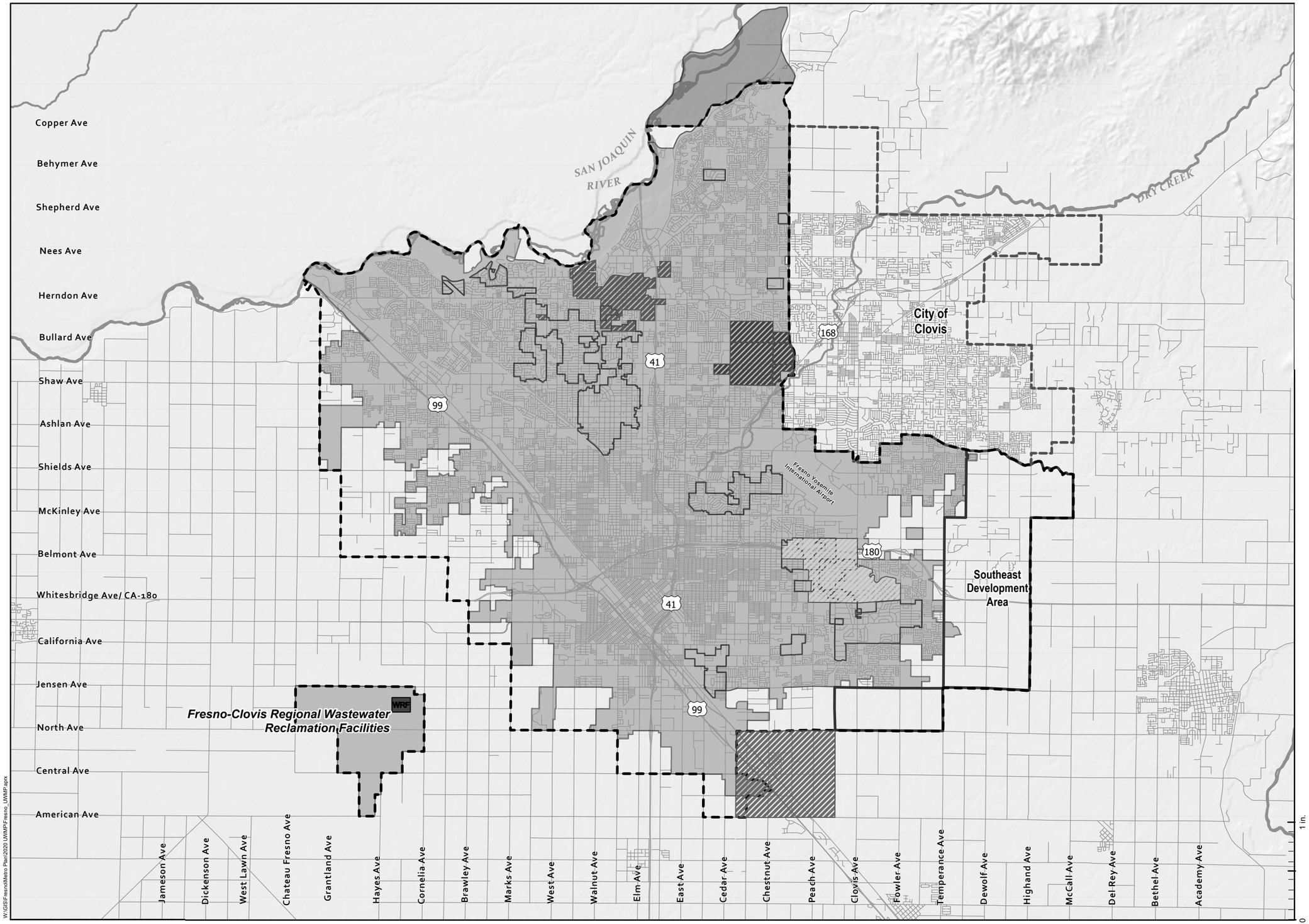
This WSCP is a detailed plan for how the City intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time.

The WSCP is used to provide guidance to the City's governing body, staff, and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. Preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions due to extended drought and catastrophic supply interruptions.

The WSCP describes the following:

- Water Supply Reliability Analysis
- Annual Water Supply and Demand Assessment Procedures
- Six Standard Shortage Stages
- Shortage Response Actions
- Communication Protocols
- Compliance and Enforcement
- Legal Authority
- Financial Consequences of WSCP Implementation
- Monitoring and Reporting
- WSCP Refinement Procedures
- Special Water Features Distinctions
- Plan Adoption, Submittal, and Availability

The 2020 WSCP is a standalone document that can be modified as needed and is included as **Appendix J** in the 2020 UWMP.



Legend

- Fresno Sphere of Influence
- Clovis Sphere of Influence
- Fresno City Limits
- County Islands
- North Area
- Southeast Development Area
- WRF Wastewater Reclamation Facility
- Streets

Areas Served Water by Others

- Bakman Water District
- Malaga Water District
- Park Van Ness Mutual Water District
- Pinedale County Water District
- CA State University, Fresno

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Prepared by:

WSC

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References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for:

City of FRESNO
Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure ES-6. City Service Area

1 CITY OF FRESNO Introduction

This plan comprises the 2020 Urban Water Management Plan (UWMP) for the City of Fresno (City), as required by the California Urban Water Management Planning Act (UWMP Act).

The UWMP Act requires all urban water suppliers with more than 3,000 connections or distributing more than 3,000 acre-feet per year (AFY) to complete an UWMP every five years.

As of the close of the 2020 calendar year, the City has over 139,500 residential, commercial, industrial, and institutional water service connections and produced nearly 122,000 AF of water. As a result, the City is required to prepare and adopt an UWMP and submit it to DWR by the July 1, 2021, due date.

IN THIS SECTION

- California Water Code
- UWMP Organization

The UWMP is a valuable planning document used for multiple purposes:

- Serves as a valuable resource to the community and other interested parties regarding water supply and demand, conservation, and water related information
- Meets a statutory requirement of the California Water Code (CWC)
- Provides a key source of information for water supply assessments and written verifications of water supply
- Supports regional long-range planning documents, including City and County General Plans
- Provides a standardized methodology for water utilities to assess their water resource needs and availability
- Provides a resource for regional involvement in the California Water Plan
- Provides for a plan during water drought situations

1.1 The California Water Code

The UWMP Act is administered by the California Department of Water Resources (DWR), which is responsible for compiling data for statewide and regional analysis and publishing the adopted documents online for public access. This report was prepared according to the requirements of the CWC, UWMP Act, and the 2020 UWMP Guidebook.

CWC Section 10620 (a) of the UWMP Act states, "Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640)." These plans are to be updated every five years and submitted to DWR.

Requirements for the UWMP include:

- Assessment of current and projected water supplies
- Evaluation of demand and customer types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan, in the event of a water shortage
- Comparison of demand and supply projections

In November 2009, the State legislation passed Senate Bill (SB) x 7-7, referred to as SBx7-7 or the Water Conservation Act of 2009. SBx7-7 set the goal of achieving a 20% reduction in urban per capita water use statewide by 2020. Retail water agencies were required to set targets and track progress toward decreasing daily per capita urban water use in their service areas, which would assist the State in meeting its 20% reduction goal by 2020.

This law requires that every UWMP include:

- Baseline per capita water use
- Urban water use target for 2020
- Compliance daily per capita water use

This 2020 UWMP has been prepared to comply with the UWMP Act and SBx7-7. In addition to meeting the requirements of the Act, this report will be used to support water supply assessments and written verifications of water supply required by SB 610 and SB 221 of 2001. These bills require that water supply information be provided to counties and cities for projects of a certain size, prior to discretionary project approval. Both bills allow an UWMP to be used as a source document to fulfill these legislative requirements. The UWMP Act has undergone significant expansion since it was originally passed, particularly since the City's previous UWMP was prepared in 2015. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions affect the reliability of each water supplier as well as the statewide water reliability overseen by DWR, the State Water Resources Control Board, and the Legislature. Accordingly, the UWMP Act has grown to address changing conditions, and the current requirements are found in Sections 10610–10656 and 10608 of the CWC.

Since 2015, several amendments have been added to the UWMP Act. These require urban water suppliers to prepare a five-year consecutive drought supply and demand assessment and a five-year drought risk assessment to evaluate the functionality of the Water Shortage Contingency Plan (WSCP) in the event of a continuous five-year drought beginning next year.

There are also new requirements for the WSCP, and it is now required to be adopted as a separate plan from the UWMP. This 2020 UWMP was developed to incorporate these new requirements, under the guidance of DWR's 2020 UWMPs Guidebook for Urban Water Suppliers. A checklist to document compliance of this 2020 UWMP with the Act and the CWC is provided in **Appendix A**.

This 2020 UWMP includes all required DWR standardized tables for **Chapters 1 to 10** compiled in **Appendix B** and all required SBx7-7 tables in **Appendix C**. A selection of these tables is also provided in the body of this Plan, as necessary to present supporting data.

1.2 UWMP Organization

This 2020 UWMP is organized into the following chapters.

- **Chapter 1 - Introduction and Overview:** This chapter provides a discussion of the purpose and content of the 2020 UWMP and the extent of the City's water management planning efforts.
- **Chapter 2 - Plan Preparation:** This chapter provides information on the City's development of the 2020 UWMP, including the basis for plan preparation, planning type, data format, and coordination and outreach to nearby agencies.
- **Chapter 3 - System Description:** This chapter provides a description of the City's water system, including service area maps, climate information, service population and demographic information, and an overview of the City's organizational structure and history.
- **Chapter 4 - Customer Water Use:** This chapter describes the City's historic, current, and projected water uses, system losses, water savings, and water use by lower income households.
- **Chapter 5 - Conservation Target Compliance:** This chapter includes a description of the City's chosen method for calculating baseline per capita water use, the City's calculated baseline, 2015 interim and 2020 per capita demand targets, and compliance with the 2020 target.
- **Chapter 6 - System Supplies:** This chapter includes a discussion of the City's water system supplies, including groundwater, surface water, wastewater, and recycled water, the City's future water projects, and a summary of existing and future water sources.
- **Chapter 7 - Water Supply Reliability Assessment:** This chapter describes the reliability of the City's water supply through a 20-year planning horizon, including a supply and demand assessment and regional reliability evaluation. Supply reliability is presented for a normal, single dry year and five consecutive dry years.
- **Chapter 8 - Water Shortage Contingency Planning:** This chapter provides a description of the City's WSCP, including stages of action, prohibitions, penalties, reduction methods, and catastrophic supply interruption.
- **Chapter 9 - Demand Management Measures:** This chapter explains the City's existing and historic efforts to promote water conservation and the City's plans to use Demand Management Measures to achieve its 2025 water use targets.
- **Chapter 10 - Plan Adoption, Submittal, and Implementation:** This chapter details the steps taken by the City to adopt the 2020 UWMP in accordance with the CWC, make it available to the public, and implement it.

- **Appendices:** These include any additional information to support and clarify any information presented within the 2020 UWMP content.

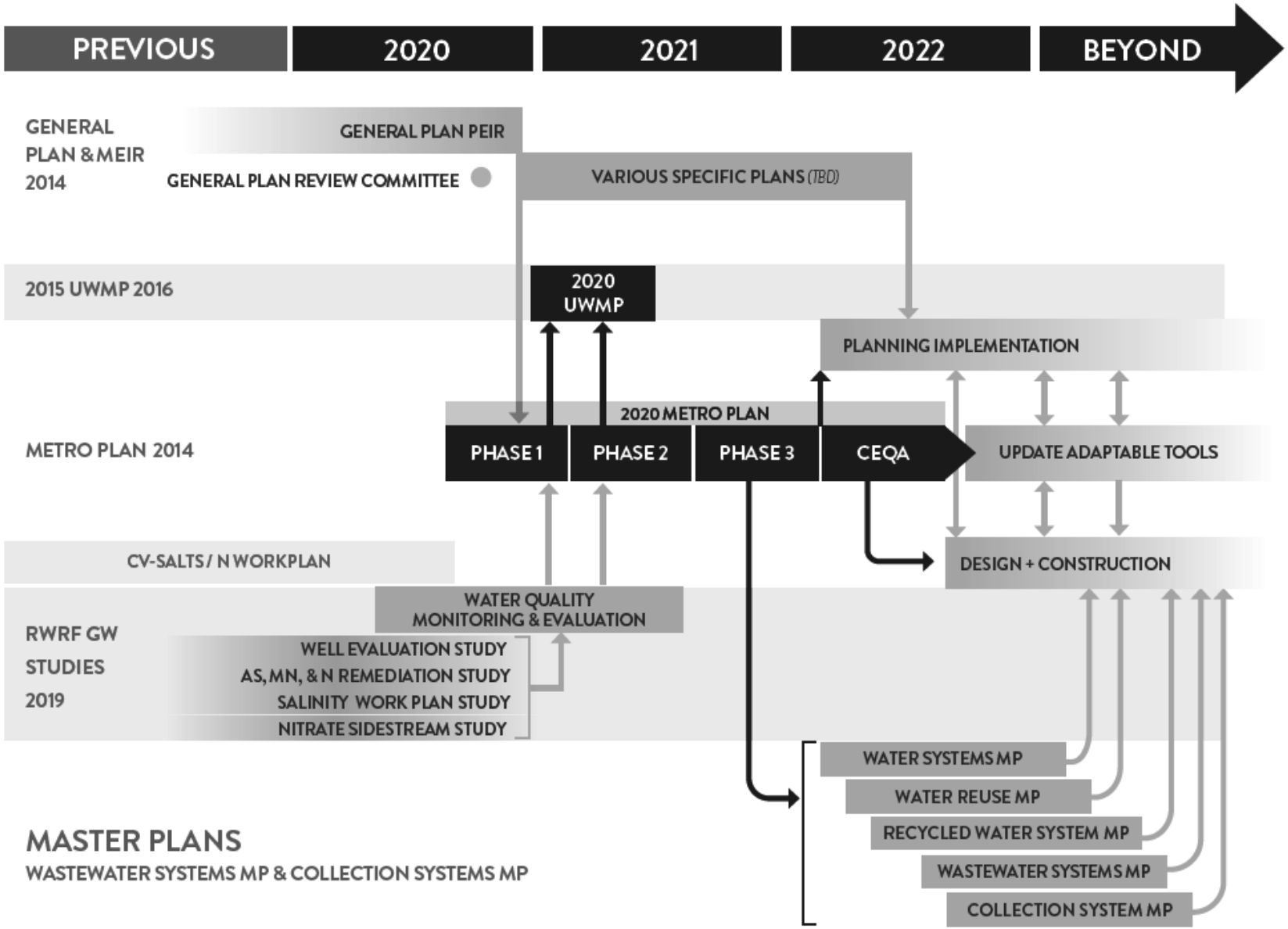
1.3 UWMPs in Relation to Other Efforts

The City previously prepared a 2005 UWMP, 2010 UWMP, and 2015 UWMP. This 2020 UWMP serves as an update to the 2015 UWMP and complies with new requirements and regulations. In addition to completing the 2020 UWMP, the City is presently updating its Fresno Metropolitan Water Resource Management Plan (Metro Plan). The last Metro Plan was completed in 2014, and the current Metro Plan update will prepare a fresh look at the City's water resources and consider new conditions and strategies for planning through 2070. **Figure 1-1** shows the City's ongoing and additional future water resources planning efforts.

1.4 Demonstration of Consistency with the Delta Plan

A new requirement for the 2020 UWMP is that agencies that anticipate participating in, or receiving water from, a proposed project utilizing Sacramento-San Joaquin Delta (Delta) Water or within the Jurisdiction of the Delta Stewardship Council (covered action) should demonstrate consistency with the Delta Plan's policy to reduce reliance on the Delta. Covered actions include, but are not limited to, projects such as multiyear water transfers, conveyance facilities, or new diversions that involve transferring water through, exporting water from, or using water in the Delta, per California Code of Regulations, Title 23, Section 5003. The City of Fresno contracts with the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) Friant Division for an annual supply of 60,000 AF of Class 1 water. Although the Friant Division of the CVP does not directly divert or convey water from the Delta, the project was developed through an exchange with the Delta-Mendota supply. As restrictions on Delta exports have hindered USBR from making deliveries to the Delta-Mendota Canal, the Friant Division Class 1 allocations are reduced, and the water is transferred back to the users that would typically receive water from the Delta-Mendota Canal. As such, the City is required to demonstrate consistency with the Delta Plan's policy to reduce reliance on the Delta. **Appendix D** includes the reporting and calculations that demonstrate Fresno's reduced reliance on supply from their USBR CVP water supply.

Figure 1-1. Previous and Ongoing Water Resources Planning Efforts



2 CITY OF FRESNO Plan Preparation

The City has coordinated the preparation of its 2020 UWMP with its water suppliers, the County, the City of Clovis, nearby water agencies, and community members to develop a UWMP that adheres to the requirements of the CWC and plans for a resilient water future.

IN THIS SECTION

- Coordination and Outreach

The City of Fresno provides water service to a variety of customer sector types within the City limits, inclusive of several historic County Waterworks Districts (county islands) which have been incorporated into the City's water system.

The City has approximately 139,500 service connections and produced just under 122,000 AF of potable water in 2020. The City meets the threshold identified in the CWC to be classified as an urban water supplier and in the California Health and Safety Code as a public water system. The City provides water directly to its customers and does not wholesale water to any other agencies for potable uses (defined as sales greater than 3,000 acre-feet per year). Therefore, the City is required to prepare and update a Retail UWMP every five years. This report was prepared on a calendar year basis.

2.1 Coordination and Outreach

The City has water supply contracts with USBR and Fresno Irrigation District (FID). Each of these water suppliers has been notified of the plan update and provided water supply projections for the time period covered by this plan. Additionally, the preparation of this 2020 UWMP was coordinated with other appropriate agencies to ensure regional stakeholders had the opportunity to provide input to this plan. The City has coordinated preparation of the 2020 UWMP and solicited participation and comments with the agencies indicated in **Table 2-1**. The City has also published notices in local newspaper and encouraged the active involvement of the population within the water service area to provide feedback on the UWMP and the WSCP during the public review period, as discussed in **Section 10.1**.

Table 2-1. Agency Coordination and Outreach

AGENCY	NOTIFIED 60 DAYS PRIOR TO PUBLIC HEARING	NOTIFIED OF PUBLIC DRAFT 14 DAYS PRIOR TO PUBLIC HEARING
Bakman Water Company	✓	✓
City of Clovis	✓	✓
County of Fresno	✓	✓
Fresno Irrigation District	✓	✓
Fresno Metropolitan Flood Control District	✓	✓
Friant Water Authority	✓	✓
Garfield Water District	✓	✓
Malaga County Water District	✓	✓
Pinedale County Water District	✓	✓
North Kings Groundwater Sustainability Agency	✓	✓
US Bureau of Reclamation	✓	✓

3 CITY OF FRESNO System Description

This chapter describes the history of the City's water system, its current service area, climate, population, and demographics.

IN THIS SECTION

- Service Area
- Land Uses
- Water System
- Population and Demographics

The original Fresno water system began operations in 1876 as a non-profit organization inaugurated by a group of public-minded citizens. Initially, the water system consisted of one pumping station composed of small pumps and two storage tanks located above the second floor of one of the early store buildings. This building was located on Fresno Street between "J" and "K" Streets, presently known as Broadway and Fulton.

By 1888, the town had grown to a small city, which demanded an improved water distribution system. This was necessary because of several large fires, including the destruction of the first permanent courthouse. In 1888, the first pumping station and water tower were constructed at Fresno and "O" Street. These facilities were designed to be an integral part of a larger and continually expanding water system. This No. 1 station was in continuous use until 1959, when it was retired having served its useful purpose. Today, this building is known as the "Water Tower" and has been declared a historic structure.

Between the years of 1887 and 1890, 4-inch and 2½-inch cast iron pipe, as well as 4-inch wrought iron water mains were laid out. Most of these original “permanent pipes” have since been replaced in the present water supply system. The owner and operator of the system in 1888 was the Fresno Water Company. In 1904, the Fresno Water Company was purchased by Balch, Kerckhoff & Wishon, and was reorganized as the Fresno City Water Company. In 1926, the facilities were purchased by the California Water Service Company. This company then sold the water system to the City of Fresno in 1931, which operated as a municipal utility. It was first managed under an appointed water board, but currently is a division of the Department of Public Utilities.

Historically, the City’s supply of water consisted of direct pumping from wells drilled into the underground aquifer. Today, groundwater remains one of the City’s primary water supply sources, including 202 active and 56 inactive groundwater wells. The production capacity from the active wells is approximately 403 million gallons per day (mgd) and the total production capacity is 487 mgd, including inactive wells. The wells are located around the City to provide equitable distribution throughout the City’s water system, as described below. Most wells are connected directly into the transmission grid main system (14- to 20-inch diameter pipelines) to convey water throughout the system.

In the 1960s, the City secured a surface water contract made available from the United States Bureau of Reclamation (USBR). The City contracted with USBR for 60,000 acre-feet of water per year from the Friant Division (Millerton Lake) and developed a system to recharge the groundwater basin by “intentional recharge,” percolating the imported surface water supplies in constructed recharge basins. The City’s USBR supplies are conveyed to the City via FID canals. In 1976, the City signed a contract with FID for delivery of surface water supplies from the Kings River based on the City’s pro rata share of FID’s water entitlements. The Kings River water is used for groundwater recharge and treated for potable use.

In 2004, the City also began treating surface water supplies for direct potable use at its first surface water treatment facility located in northeast Fresno (NESWTF). For the period of 2005–2014, this 30 mgd-rated facility provided 10–15% of the City’s potable water supplies. From 2016–2020, this facility produced 15% of the City’s potable water supply, an increase largely attributed to transmission system improvements, which permitted conveying water further into the City’s distribution system, and the City’s lower overall system demands. Also, in 2015, the City commenced operations of its new T-3 Water Storage and modular Surface Water Treatment Facility (T-3 SWTF) in southeast Fresno. In January 2013, the City completed the installation of meters on all single-family residences.

In 2018, the City completed construction of its new 54 mgd surface water treatment facility in southeast Fresno (SESWTF) and large diameter water mains that serve nearly one-half of the City. Production from this facility may ultimately be 80 mgd with the City demonstrating to the Division of Drinking Water (DDW) that the facility is capable of safely running at higher filter loading rates. With the SESWTF operational, along with the NESWTF and T-3 SWTF, the City provided greater than 50% of its potable supply through using surface water for the first time in 2019 and 2020. The City expects to provide half or more of its potable demand using its surface water supply sources going forward.

3.1 Service Area

The City of Fresno presently covers approximately 115 square miles (sq mi) (73,500 acres) consisting largely of single-family residential, commercial, public, and industrial development. It also includes several areas not within the City limits (e.g., County islands), as shown in **Figure 3-1**. With the exception of the Bakman Water Company (Bakman), Pinedale County Water District (Pinedale), Park Van Ness Mutual Water Company (Park Van Ness), California State University Fresno (CSUF), and private groundwater users located within County islands, the City currently serves water to the entire area encompassed by its City limits and will eventually serve out to the Sphere of Influence (SOI) boundary. The SOI is coincident with the City of Fresno General Plan Land Use and Circulation Map, which was adopted in the 2014 General Plan and therefore, includes all lands planned to be annexed by the City at the projected 2056 buildout of the General Plan (City of Fresno Development and Resource Management Department, 2014).

3.1.1 Land Uses within Service Area

According to the General Plan and the City's Planning and Development Department, the City's planning area covers approximately 106,000 acres (165.6 sq mi) comprised of approximately 73,500 acres (115 sq mi) of incorporated land and 32,500 acres (50.8 sq mi) of unincorporated land based on the City's current shapefiles. The total 106,000-acre planning area includes approximately 84,300 acres of developed or planned to be developed land, approximately 18,500 acres of roads, highways, and railroads with no corresponding water demand, and about 2,500 acres outside of the SOI north of the City's most northwesterly portion referred to as the North Area and shown on **Figure 3-1**.

Of the 106,000 acres within the City's planning area, the City's water service area covers 70,400 acres (110 sq mi) of land within the SOI, which includes most of the 73,500 acres of incorporated area and the unincorporated County Islands not within the City limits. As shown in **Table 3-1**, approximately 59,100 acres of the 70,400 acres within the water service area are developed and served water by the City. The remainder consists of vacant land that will be served by the City when it is developed. Residential units make up the largest portion of water demand served by the City, consisting of over 40% of the total served area and almost 90% of the total service connections.

The remaining areas within the City's SOI are served by other systems or are unserved by a water system, consisting of open space and agricultural land, land used by roads, highways, and railroads, as well as the North Area.

Table 3-1. Current Service Area Characteristics

LAND USE TYPE	AREA (ACRES)	% OF TOTAL AREA	SERVICE CONNECTIONS	% OF TOTAL CONNECTIONS
Single-Family Residential	27,700	39.3%	118,775	85.1%
Multifamily Residential	3,700	5.3%	6,087	4.4%
Commercial	4,500	6.4%	11,982	8.6%
Public	5,600	8.0%	2,504	1.8%
Industrial	4,500	6.4%	175	0.1%
Open Space/ Landscape Irrigation	13,100	18.6%	Note 1	
Total	**59,100**		**139,523[2]**	**100%**
Vacant / Partially Vacant[3]	11,300	15.9%	N/A	
Total	**70,400**	**100%**		

Source: Acreage from City of Fresno Geographic Information System Shapefile of Land Uses provided 8/12/20. Number of connections provided by the City for 2020.

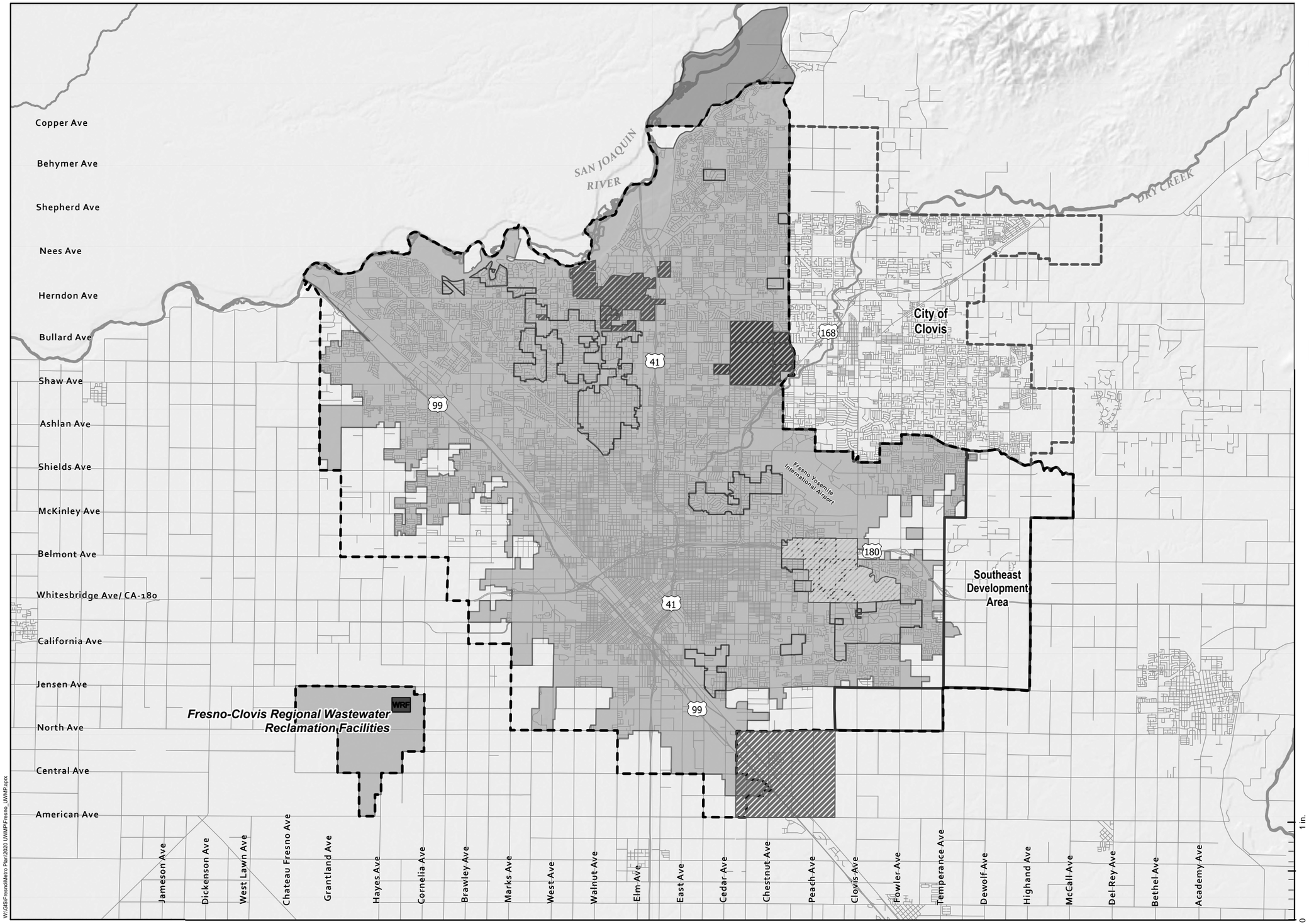
Notes:

1. Dedicated irrigation meters are included in commercial and public meter total.
2. Approximately 3,633 dedicated fire service connections are included in the total services connections, most of which are included in the commercial and public meter total.
3. For partially vacant land, half of the area is included in the zoned land use type and the other half is assumed vacant.

3.1.2 Water System

The City's water system consists of about 1,860 miles of distribution and transmission mains, 202 active municipal groundwater wells, three surface water treatment facilities (SWTFs) with current rated capacities ranging from 4 to 54 mgd, five water storage facilities with pump stations, including one at each of the SWTFs plus two in the distribution system, and three booster pump facilities.

The City's service area spans an approximate 120 feet of elevation difference, declining from northeast to southwest. To help regulate pressure throughout the water distribution system, the City utilizes five pressure zones, as shown on **Figure 3-2**: Highway 41, Shepherd, Sierra, Southwest, and Booster Pump 4 (BP04). The pressure zones are separated by a series of closed or partially closed valves between each zone to prevent or impede flow from one zone to the next, referred to as gate systems. There are four gate systems — Shepherd, Sierra, Southwest, and BP04 — separating the five pressures zones. The Highway 41 Pressure Zone was previously split into two pressure zones divided by a series of 26 gate valves closely following the alignment along Highway 41. However, these zones were combined into a single zone in 2015 by fully opening the Highway 41 gate valves, and as a result are not shown on **Figure 3-2**.



Legend

- Fresno Sphere of Influence
- Clovis Sphere of Influence
- Fresno City Limits
- County Islands
- North Area
- Southeast Development Area
- WRF Wastewater Reclamation Facility
- Streets

Areas Served Water by Others

- Bakman Water District
- Malaga Water District
- Park Van Ness Mutual Water District
- Pinedale County Water District
- CA State University, Fresno

W:\GIS\Fresno\Metro Plan\2020 UWMP\Fresno_UWMP.aprx

Prepared by: WSC

N

1:140,000

0 0.75 1.5 3 Mi

0 3,750 7,500 15,000 US Feet

References:

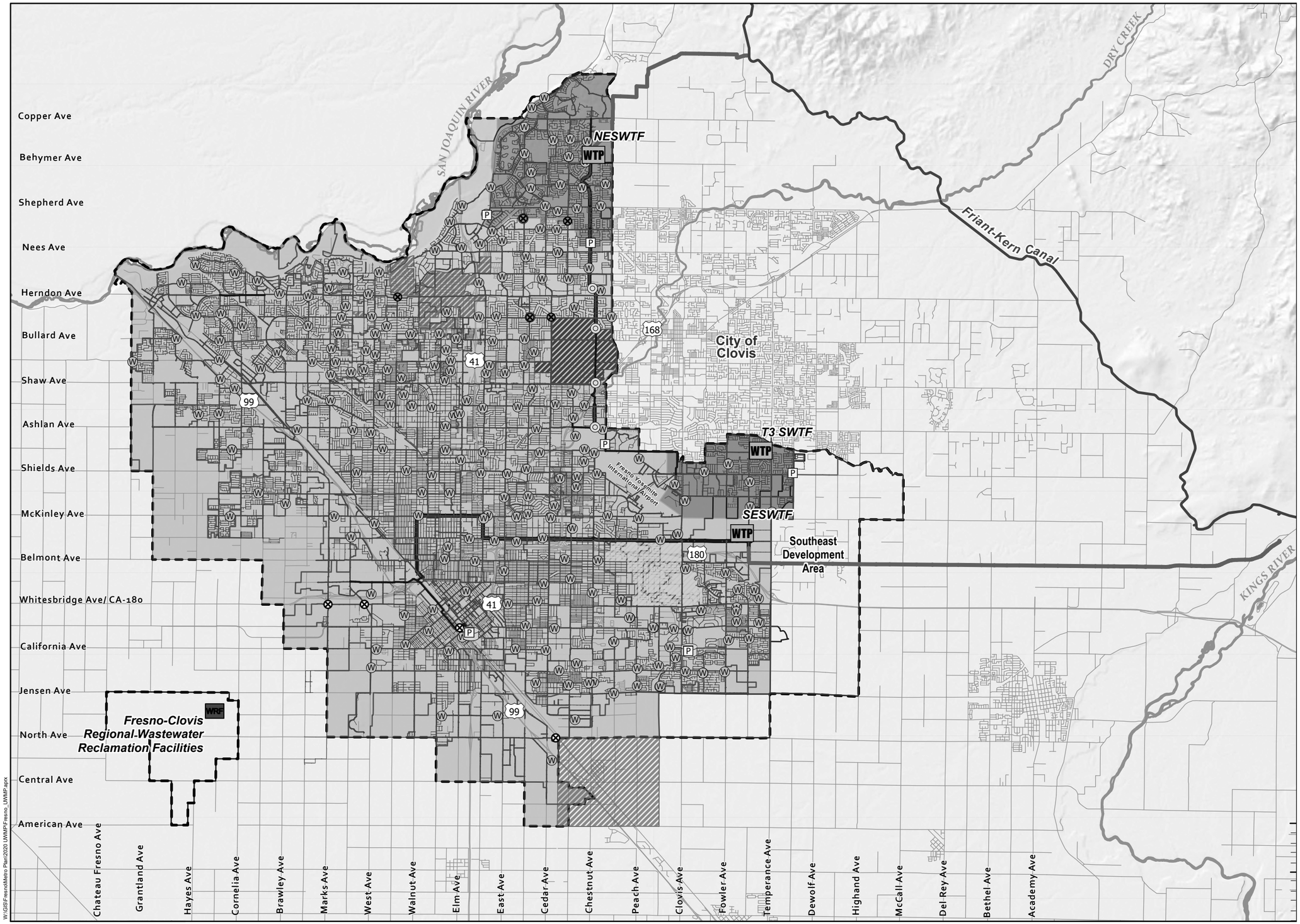
1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 3-1. City Service Area



Legend

City Facilities

- WTP — Water Treatment Plant
- P — Booster Pump Station
- Storage Facility
- W — Active Well
- Existing Turnout
- WRF — Wastewater Reclamation Facility

Gate System Valves

- Pressure Relief Valve
- Pressure Sustaining Valve

Water Mains by Diameter (inch)

- <10
- 10 - 16
- 16 - 30
- 30 - 72

Raw Water Mains by Diameter (inch)

- <10
- 10 - 16
- 16 - 30
- 30 - 72
- Friant-Kern Canal

Areas Served Water by Others

- Bakman Water District
- Malaga Water District
- Park Van Ness Mutual Water District
- Pinedale County Water District
- CA State University, Fresno

Pressure Zones

- Highway 41
- Booster Station 4
- Shepherd
- Sierra
- Southwest

City Features

- Southeast Development Area
- Fresno Sphere of Influence
- Fresno City Limits
- Streets

Prepared by: WSC

N

1:136,886

0 0.75 1.5 3 Mi

0 3,500 7,000 14,000 US Feet

References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for: City of Fresno, Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 3-2. Water System

3.2 Service Area Climate

The City's service area is in California's San Joaquin Valley in Fresno County along Highway 99. The climate of the area is best described as Mediterranean, characterized by hot dry summers and cool winters. Precipitation in the area averages around 11 inches per year, as shown in **Table 3-2**. However, rainfall can significantly vary year to year, with over 18 inches received in 2011 and less than 4 inches received in 2014. The recent drought was marked by four consecutive years (2012 to 2015) of less than 10 inches of rainfall. As shown by the average evapotranspiration (ET_o) and temperature values in **Table 3-2**, the City's water use in the summer months is significantly higher than in the winter, reflecting increased water use for irrigation purposes during the hot, dry summers.

Table 3-2. Average Climate Characteristics

MONTH	ET_o (INCHES)	RAINFALL (INCHES)	TEMP-HIGH (°F)	TEMP-LOW (°F)
Jan	1.17	2.33	56.9	37.4
Feb	1.98	1.8	62.6	39.8
Mar	3.73	1.99	68.4	43.6
Apr	5.43	0.99	73.7	46.9
May	7.33	0.54	81.3	53.2
Jun	8.41	0.19	89.6	59.1
Jul	8.8	0.02	95.7	63.8
Aug	7.82	0.01	94.6	62.5
Sep	5.69	0.07	89.6	57.9
Oct	3.68	0.59	79.3	49.3
Nov	1.85	0.98	66.2	40.6
Dec	1.10	1.83	56.5	36.1
Total/ Average	**56.99**	**11.34**	**76.2**	**49.2**

Source: CIMIS Website: http://www.cimis.water.ca.gov, Station 80 Fresno State (1988 to 2020) Monthly Average Report, October 2020 (downloaded November 30, 2020)

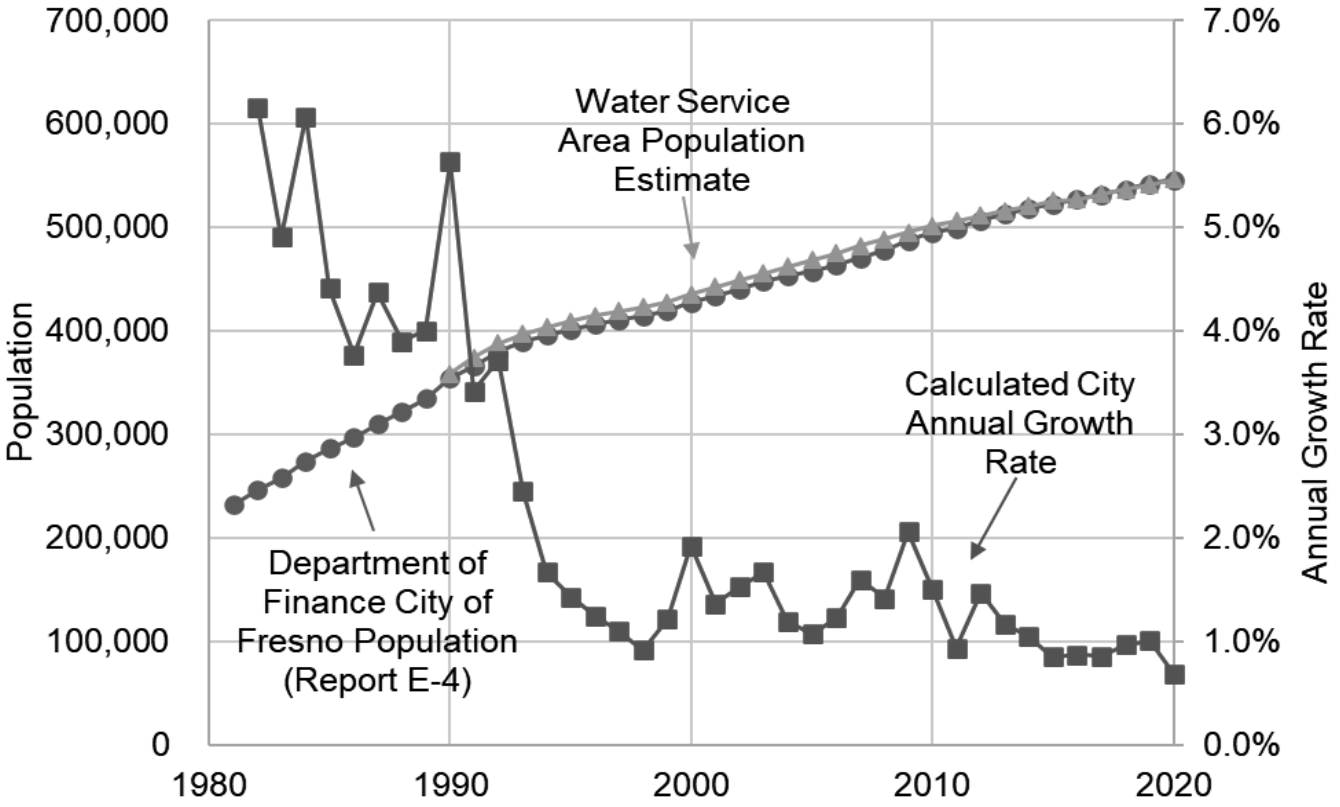
3.3 Service Area Population and Demographics

The City experienced rapid growth since it was founded by the Central Pacific Railroad in 1872 up through the mid-1990s, when the City's annual growth rate was typically greater than 2%. From 1995 to 2015, the annual growth rate has decreased to an average of 1.3%, and since 2015, the rate has not surpassed 1.0%.

The population served by the City Water Division is slightly higher than the City's population after adding unincorporated areas served by the City and removing areas within the City limits served by private water companies, special districts, or private wells. The City acquired County service areas and facilities in 1989, which increased the service area population to slightly greater than the City population since 1990.

Figure 3-3 compares the historic City population to the water service area population since 1990. Water service area population estimates prior to 1990 were unavailable for comparison to the City's population. The City Water Division's methodology for calculating the population of the City's water service area involves summing all the Census tract data for the City's overall service area and subtracting out tracts not served by the City. These tracts included areas served by Pinedale, Bakman, and CSUF, as well as areas outside the City service area, unserved areas within County areas, unserved areas within City areas, and areas with only partial service (i.e., straddling City service areas). Based on the City's methodology, the water service area population was estimated to be 546,502 in 2020, compared to 545,769 for the total City population in January 2020 (California Department of Finance, 2020). For comparison, in the 2015 UWMP, the City Water Division population served was 525,575 compared to the total City population of 522,369 (California Department of Finance, 2020). The City's water service area population in 2020 using the DWR Population Tool is 550,217 and is similar to the population estimate using the City's methodology.

Figure 3-3. City of Fresno and Water Service Area Historic Population



The City's General Plan is the City's primary growth planning document from which the baseline water service area population projection for this UWMP was developed. The General Plan includes population estimates for the City planning area, which includes all areas within City limits and unincorporated areas outside of City limits within the City's SOI, based on projections developed by the Fresno Council of Governments and estimates a buildout population of 921,057 in 2056. In 2017 the Fresno Council of Governments developed population projections in 5-year increments through 2050 for all cities within Fresno County (Applied Development Economics, Inc. and Mintier Harnish Associates, 2017). The Fresno Council of Governments' 2017 report projects the City's population will grow at an annual growth rate ranging from 0.92–1.44%, with an average annual growth rate between 2020 and 2056 (buildout) of 1.03% per year. These population projections and growth rate have been incorporated in the City's General Plan population projections.

According to the City's Planning and Development Department, the City's water service area population is anticipated to continue to grow along with the City, with some slightly higher growth years anticipated within the next 10 years due to multiple large developments planned for completion in the near term. For planning purposes, this UWMP assumes the City will slowly incorporate areas served by others within the City's SOI by buildout in year 2056. As such, the long-term water service area population annual growth rate is expected to be 1.44% between 2020 and 2056 to account for absorbing these areas into the City's water system.

The baseline population projection starts with the 2020 water service area population determined using the DWR Population Tool and grows based on areas expected to be developed by 2030,

as provided by the City's Planning Department, and then linearly beyond 2030 to meet the buildout population in 2056. The City's 2020 population estimate includes the entire City planning area, including areas not served water by the City and areas currently outside the City limits but within the SOI, and is higher than the current water service area population. The water service area population projection assumes the City will incorporate all areas currently served by others and grow to provide water service to all areas within the SOI by buildout. Because the water service area has more growth potential than the City planning area, the annual average growth rate as calculated ranges from 1.1–2.1% between 2020 and 2056, with an average annual growth rate of approximately 1.56% between 2020 and 2045 that continues to slow through the buildout. **Table 3-3** shows the water service area population projections through 2045 in five-year increments.

Table 3-3. Current and Projected Population (DWR 3-1R)

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**550,217**	**609,433**	**674,677**	**719,327**	**765,278**	**812,529**

3.3.1 Other Social, Economic, and Demographic Factors

Most recently, the City is experiencing significant impacts due to the global pandemic caused by COVID-19 (SARS-CoV-2) virus. In March 2020, the State issued a stay-at-home order that forced many businesses to close and other businesses to require residents to continue work only from their home to slow the spread of the virus. Additionally, the forced closure of several businesses caused a historic increase in unemployment across the US and a resulting economic recession. While all the impacts of COVID-19 are not entirely known at this time, it has caused a shift in water use by customer class. In 2020, residential demands increased by over 8% from 2019 demand, while commercial and industrial water use decreased by over 5%. This shift is expected to be temporary with an anticipated return to previous levels once all stay at home orders are lifted and businesses can reopen. However, the economic recession could have longer term impacts to the region.

4 CITY OF FRESNO
Water Use Characterization

This chapter describes and quantifies 2020 water use and projected water use through 2045 within the City's service area.

Water consumption in the City is characterized by the typical demand sectors of residential, commercial, institutional, industrial, and irrigational. The difference between production and consumption is losses, which may be attributed to system leaks, meter inaccuracies, fire flows, theft, unmetered use, or other factors.

IN THIS SECTION

- Distribution System Water Losses
- Past and Current Water Use
- Projected Water Use

4.1 Non-Potable Versus Potable Water Use

The City serves its customers potable water for residential, commercial, institutional, industrial, and landscape irrigational demands through its potable water distribution system.

The City also diverts raw surface water obtained from the United States Bureau of Reclamation (USBR) and Fresno Irrigation District (FID) to recharge basins throughout the service area. The City coordinates with FID for the delivery of the recharge water, utilizing FID's existing system of channels and pipelines to convey the raw water, and with Fresno Metropolitan Flood Control District (FMFCD) to deliver water to FMFCD's stormwater retention and recharge basins or its own recharge basins. The raw surface water recharges the groundwater basin to sustain the groundwater supply for the City. The groundwater recharge volume can vary based on surface water supply availability and is represented as an addition to annual groundwater supplies as discussed in **Chapter 6**. In addition, the City serves a limited number of customers secondary treated or tertiary treated and disinfected recycled water for agricultural irrigation or landscape irrigation, respectively. The recycled water demands are discussed in **Section 6.4**.

4.2 Past, Current, and Projected Water Use by Sector

The following sections document the past and current water use for each sector, and the projected water use through 2045.

4.2.1 Water Use Sectors

Records of historical water consumption serve as the basis for developing water demands by water use sector. Water consumption is the volume of water measured at each metered service.

The City tracks water consumption across different water use sectors listed in the California Water Code (CWC), including:

- Single-Family Residential
- Multifamily Residential
- Commercial and Institutional / Governmental
- Industrial
- Landscape
- Distribution System Losses

In addition to the water uses listed in the CWC, the City participates in exchanges and transfers, provides temporary travel meters for temporary water use, and diverts non-potable surface supplies for groundwater recharge, described below. The City does not provide water for sales to other agencies, saline water intrusion barriers, or agricultural use.

4.2.1.1 Exchanges

Since 1976, the City has had a water exchange agreement with FID for delivery of the City's percolated wastewater effluent — considered equivalent to tertiary treatment — to FID canals. This is not counted as a water use in this chapter and is discussed as a water supply in **Section 6.6.1.2**.

4.2.1.2 Other

A small, quantified water demand has been classified as “other” to account for temporary travel or construction meters for water used for dust control. This use type typically accounts for less than one percent of total water use.

4.2.2 Distribution System Water Losses

Real losses, as defined in the American Water Works Association (AWWA) Water Audit tool are:

“Physical water losses from the pressurized system (water mains and customer service connections) and the utility’s storage tanks, up to the point of customer consumption. In metered systems, this is the customer meter; in unmetered situations, this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks, and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks, and overflows.”

The past five years of distribution system losses are listed in **Table 4-1**, and the results of the 2016-2019 AWWA Water Audit Tool are provided in **Appendix E**. The AWWA Audit Worksheet was not completed for 2020 prior to the submittal of this plan, and the volume of water loss is estimated as the difference between water produced and metered water consumed for each calendar year period.

The overall consumption of water in the system is placed into four different categories:

- Billed Metered Usage
- Billed Unmetered Usage
- Unbilled Metered Usage
- Unbilled Unmetered Usage

The water losses for the system were found by determining the difference between the overall amount of water supplied to the community and the apparent system losses. The City’s system losses have many different possible causes such as hydrant flushing/testing, construction, firefighting, system leaks, water main breaks, and meter error. The estimated loss in 2020 is 9,568 acre-feet (AF), which is the difference between metered production and metered consumption and is approximately 8% of the overall system production. Based on the previous four years of audits, the City has not had to apply meter adjustments in the AWWA Water Audit Tool, and the water losses report is the difference between water produced and metered water consumed each year. It is anticipated that the estimated 2020 water loss volume in **Table 4-1** will be the water losses reported on the 2020 AWWA Audit when it is certified.

Currently, the City does not have a water loss standard but intends to evaluate programs to reduce water losses in their Metro Plan that is currently being updated. The City is also tracking forthcoming water use standards, which will include a water loss standard that is planned to be adopted by the Water Board within the next few years.

Table 4-1. DWR 4-4R 12 Month Water Loss Audit Reporting

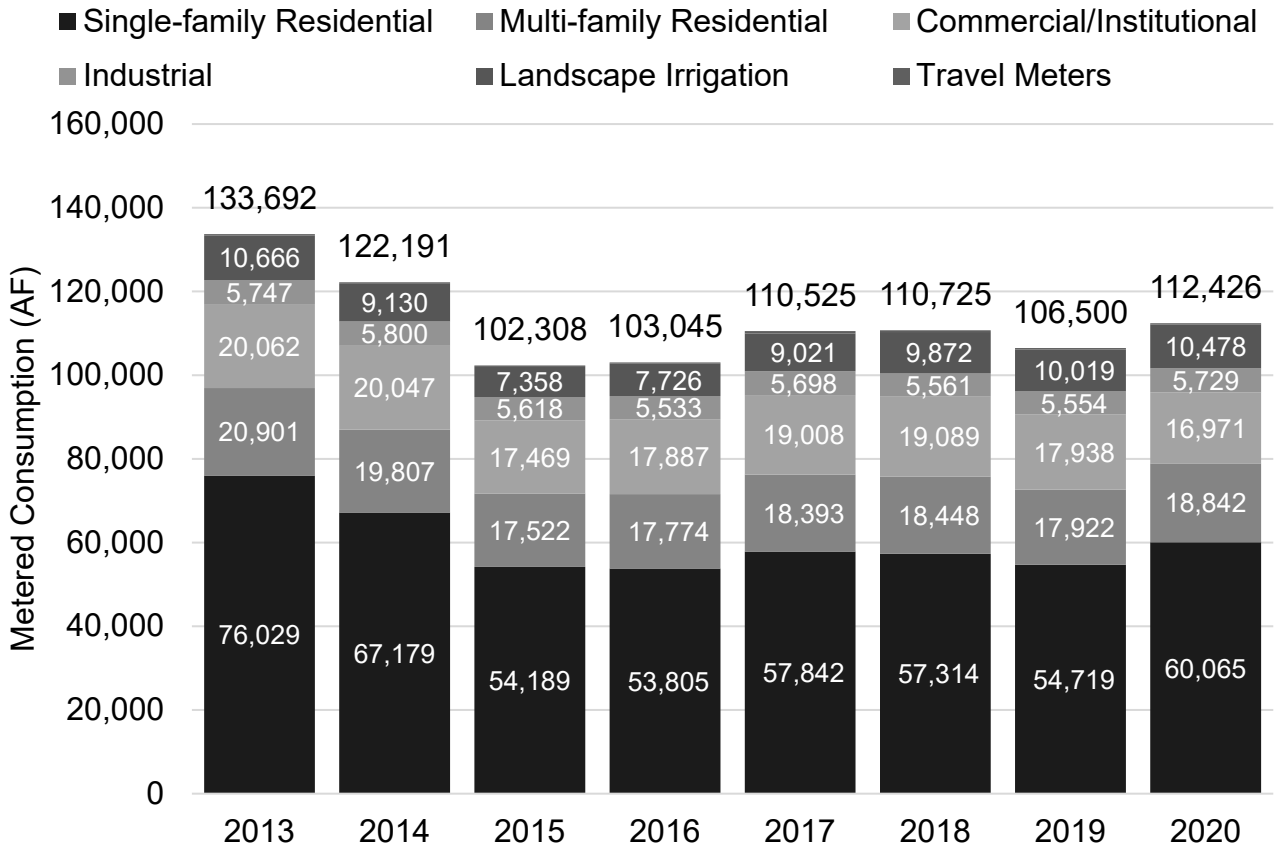
REPORT PERIOD START DATE		VOLUME OF WATER LOSS, AFY	PERCENT LOSS OF PRODUCTION
MM	YYYY		
1	2016	9,036	8.0%
1	2017	10,235	8.5%
1	2018	9,028	7.5%
1	2019	9,059	7.8%
1	2020	9,568	7.8%

For 2016 through 2019, volume of water loss is taken from the AWWA Water Audit Tool. For 2020, the volume of water loss is the difference in metered production and metered consumption.

4.2.3 Past and Current Water Use

Since 2013, all water services in the City's water service area have been metered. Prior to 2013, the City estimated single-family residential water use, since these services were not equipped with meters, by subtracting all other metered uses (commercial, institutional, industrial, and irrigational), plus 10% assumed losses, from production data. Water consumption for the City's water service area by customer type for 2013–2020 is shown on **Figure 4-1**.

Figure 4-1. Historical Consumption by Customer Type (2013–2020)



As shown in the figure, single-family residential water use has decreased more than 20,000 AFY since the Single-Family Metering Program was completed in 2013. Multifamily residential, commercial, and institutional services have historically been metered, and consumption has also decreased since 2013, with industrial users and landscape irrigation consumption at similar levels to 2013 consumption, even as new customers are connected to the City's water system. Landscape irrigation demands did decrease in 2015 and 2016, likely due to the drought restrictions, and continue to recover after the drought ended in 2017.

Table 4-2 provides the breakdown of actual water use by sector type in calendar year 2020. As shown in **Table 4-2**, single-family residential water use is the largest use type in the City and accounted for almost 50% of potable water use in 2020. Multifamily residential use was the second largest, accounting for approximately 15% of water sales in 2020. Together, residential water use accounts for about 65% of all potable water uses in the City's service area. The remaining potable water uses consist of mainly commercial and institutional water use, which are tracked together and included only on the commercial use row on **Table 4-2**, followed by landscape irrigation and industrial usage. Distribution losses accounted for approximately 8% of potable water used in 2020 (per **Section 4.2.2**).

Table 4-2. Actual Demands for Water: Potable (DWR 4-1R)

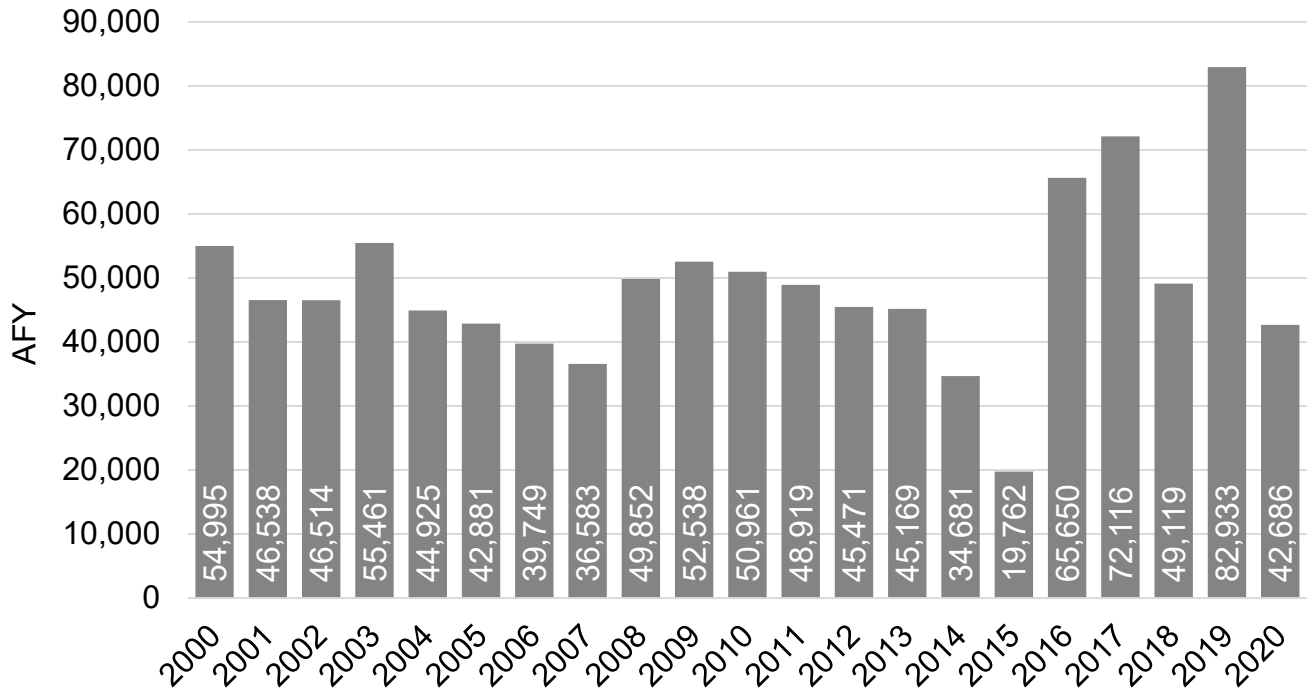
USE TYPE	ADDITIONAL DESCRIPTION	LEVEL OF TREATMENT WHEN DELIVERED	2020 VOLUME	PERCENT OF TOTAL
Single Family		Drinking Water	60,065	49.2%
Multi-Family		Drinking Water	18,842	15.4%
Commercial		Drinking Water	16,971	13.9%
Industrial		Drinking Water	5,729	4.7%
Institutional/ Governmental	See Note 1	Drinking Water	---	---
Landscape		Drinking Water	10,478	8.6%
Other	Travel Meters	Drinking Water	340	0.3%
Losses		Drinking Water	9,568	7.8%
Total:			**121,993**	**100%**

Note:

1. Institutional and Governmental water usage is included in the Commercial use type.

Figure 4-2 shows the historic volume of the City's raw surface water used for groundwater recharge since 2000. Over the last 20 years (2000–2020), the average annual intentional recharge of surface water was 49,240 AFY. Total recharge has ranged from a high of 82,900 AF in 2019 and a low of 19,700 AF in 2015. Also, total recharge volumes in 2016, 2017, and 2019 were three of the highest volumes in the last 20 years. The increases were due to over 30% increase in recharge at City basins from the addition of several basins (Nielsen, Fancher) and proactive maintenance of basins to maximize percolation capacity. The annual variability between years is caused by several factors, including basin availability, water delivery season, pond maintenance, or length of wet seasons.

Figure 4-2. Historic Recharge of City Surface Water



4.2.4 Projected Water Use

4.2.4.1 Land Use Projections

The potable demand projections through 2045 for normal water use follow the methodology for land use-based projections described in Appendix K of the 2020 Urban Water Management Plan (UWMP) Guidebook. Under this methodology, existing land use and demand is accounted separately from future land use and demand. This allows different demand factors to be applied to current land use areas and future land use areas. Future land use areas represent future customers and developments that are expected to be more water efficient than existing land uses and buildings due to the California Plumbing Code (CPC) and use of higher efficiency appliances and landscapes.

The existing and future land use acreage was sourced from the City's Geographic Information System (GIS) database and the City's General Plan. The existing land use shapefile and associated acreage for each land use classification were used to represent 2020 land use data. Areas not served by the City were excluded from the existing land use shapefile. The future land use shapefile corresponds with the planned land use at buildout as described in the City's General Plan representing the year 2056. Although the City does not have any plans to serve areas currently served by others within the City limits, all areas within the City Sphere of Influence (SOI) were assumed to be served by the City by buildout for conservative planning purposes. **Table 4-3** lists the land use acreage by land use category for the 2020 and buildout 2056 water service areas.

The land use acreage between 2020 and 2056 was estimated in 5-year increments based on areas planned to be developed by 2030 from the City's Planning Department, and by linearly interpolating the remainder of the change in acreage for each land use category between 2030 and 2056. **Figure 4-3** shows the existing and projected land use by customer class used to develop the projections.

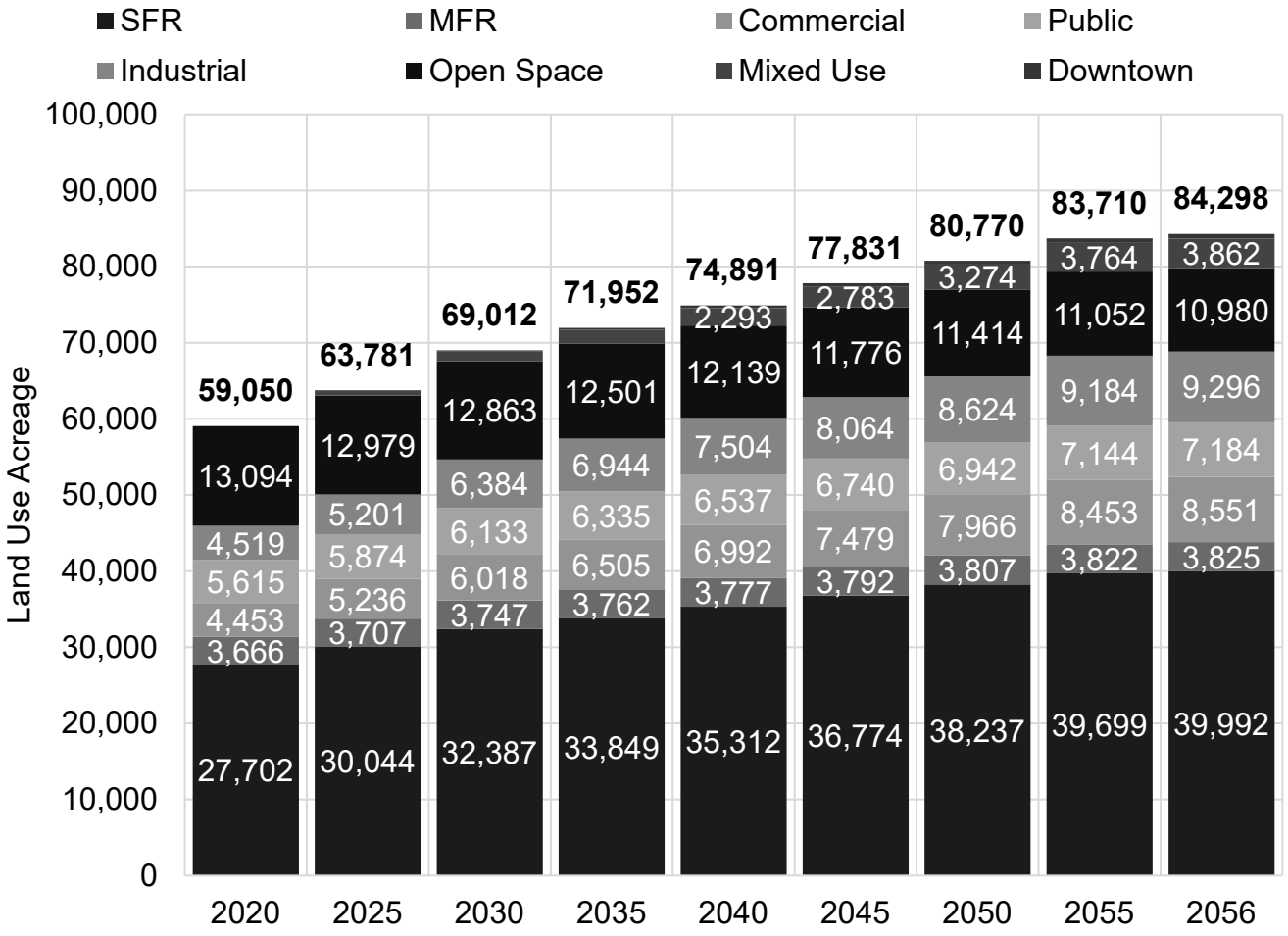
Table 4-3. Existing and Future Water Service Area Acreage

LAND USE CATEGORY	2020 WATER SERVICE AREA[1, 3, 4]		2056 WATER SERVICE AREA[2]	
	ACRES	PERCENT	ACRES	PERCENT
Single-Family Residential	27,700	47%	40,000	47%
Multifamily Residential	3,700	6%	3,800	5%
Commercial	4,500	8%	8,600	10%
Public Facility	5,600	9%	7,200	9%
Industrial	4,500	8%	9,300	11%
Open Space/ Landscape Irrigation	13,100	22%	11,000	13%
Mixed Use[3]	0	0%	3,900	5%
Downtown[3]	0	0%	600	1%
TOTAL	**59,100**	**100%**	**84,300**	**100%**

Notes:

1. Acreage from City of Fresno GIS Shapefile of Land Uses provided 8/12/20 and reduced to the City's water service area (excludes Pinedale, Bakman, and California State University Fresno and unserved areas outside the City limit and SOI).
2. Future Land Use Shapefile provided by the City on 8/12/20 and aligns with the General Plan for buildout in year 2056. The buildout service area acreage listed excludes the Fresno-Clovis Regional Wastewater Reclamation Facility, land used for road, highways, and railroads, and the north area outside of the SOI.
3. Mixed use and downtown land use categories are not in the existing land use shapefile. They are described in the General Plan as new designations for redevelopment of existing areas that contain a mix of land uses.
4. Approximately 11,300 acres of non-water demanding vacant/partially vacant land is excluded from the 2020 water service area acreage.

Figure 4-3. Existing and Projected Land Use



Note: Acreage for Mixed-use and Downtown land use types are not shown every year for clarity, but are included in the total acreage value.

4.2.4.2 Demand Factors and Future Savings

Land use-based water demand factors were developed using 2018 metered consumption data matched to 72 categories of land use data. These demand factors were applied to the 2020 land use acreage by category to develop the demand projection beginning in 2020. Demand factors for land uses that grow over time and represent new developments were assigned a lower demand factor than the demand factors for existing development. Additionally, demand factors were assumed to slowly reduce over time due to passive conservation, which includes the replacement of older water fixtures and appliances with more efficient types now required as part of the CPC. The passive conservation savings are projected to be greater for existing customers than future customers because future customers are already assumed to have a lower water demand factor and meet the plumbing code.

Future savings due to passive conservation were developed using the Alliance for Water Efficiency (AWE) Water Conservation Tracking Tool. The Tracking Tool is an Excel tool that can

incorporate water service area-specific data to estimate natural replacement rates of fixtures and future savings based on the CPC.

Table 4-4 lists the passive conservation savings assumption incorporated in the potable demand projections. Existing unit demand factors are reduced by the percentages listed to develop the future development unit demand factors. As shown in the table, this assumes future residential and non-residential dwelling units are 10% and 5% more water efficient, respectively, than existing dwelling units due to changes in the plumbing code and ever-increasing new water efficient technology. **Table 4-5** compares the total potable demand projections without the estimated savings due to passive conservation from 2025–2045.

Table 4-4. Passive Conservation Savings Assumptions

LAND USE TYPE	FUTURE DEVELOPMENT UNIT DEMAND FACTOR REDUCTION[1]	EXISTING DEVELOPMENT ANNUAL PASSIVE CONSERVATION SAVINGS[2]	FUTURE DEVELOPMENT ANNUAL PASSIVE CONSERVATION SAVINGS[3]
Residential/Mixed Use	10%	0.20% per year	0.04% per year
Commercial/Downtown	5%	0.05% per year	0.01% per year
Public	5%	0.05% per year	0.01% per year
Industrial	5%	0.05% per year	0.01% per year
Open Space/ Landscape Irrigation	0%	0% per year	0% per year

Notes:

1. Existing (2020) unit demand factors are reduced by the percentages listed to develop the future development unit demand factors.
2. Existing development annual passive conservation savings were developed using the AWE Water Conservation Tracking Tool.
3. Future development passive conservation savings are assumed to be one-fifth the rate of existing development passive conservation savings.

Table 4-5. Projected Future Savings for Potable Demands, AF

	2025	2030	2035	2040	2045
Total Potable Demand with no conservation	137,521	149,361	157,204	165,047	173,160
Estimated Passive Conservation	1,017	2,005	2,994	3,973	5,213
TOTAL POTABLE DEMAND WITH PASSIVE CONSERVATION	**136,504**	**147,356**	**154,210**	**161,074**	**167,947**

4.2.4.3 Demand Projections

Table 4-6 provides the projected demands by use type based on the methodology described above. **Table 4-7** includes the projected raw surface water used for groundwater recharge through the planning period for normal years. The City intends to recharge an average of 60,000 AFY beyond 2020, corresponding with the average recharge volume from 2016 through 2020, and gradually increase recharge by about 540 AFY each year. In 2025, the normal year groundwater recharge is projected to be 62,700 AFY and will continue to increase to 73,500 AFY by 2045. The actual volume recharged is based on the available surface water supplies each year, as well as available basin capacity and other factors, and may be lower in dry years or higher in wet years.

Table 4-6. Projected Demands for Water: Potable (DWR 4-2R)

USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE				
		2025	2030	2035	2040	2045
Single Family		76,255	80,429	82,934	85,437	87,936
Multi-Family		19,000	20,654	21,737	22,831	23,935
Commercial		19,052	21,135	22,587	24,041	25,496
Industrial		7,410	9,003	9,922	10,841	11,758
Institutional/ Governmental	See Note 1					
Landscape		4,490	5,035	5,422	5,809	6,196
Other	Travel Meters	200	200	200	200	200
Losses		10,097	10,900	11,408	11,917	12,426
TOTAL:		**136,504**	**147,356**	**154,210**	**161,076**	**167,947**

Note 1: Institutional and Governmental water usage is included in the Commercial use type.

Table 4-7. Projected Demands for Water: Non-Potable (DWR 4-2R)

USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE				
		2025	2030	2035	2040	2045
Groundwater Recharge	Raw-Water	62,700	65,400	68,100	70,800	73,500
TOTAL:		**62,700**	**65,400**	**68,100**	**70,800**	**73,500**

4.2.4.4 Future Conservation

In 2018, following the unprecedented drought, California Legislature established a framework centered on "Making Water Conservation a California Way of Life." The goal was to help the State better prepare for droughts and climate change by establishing statewide water efficiency standards and incentivizing recycled water (California Department of Water Resources, State Water Resources Control Board, November 2018). The resulting legislation of Senate Bill 606 and Assembly Bill 1668, along with future regulations, will have impacts on water providers over the coming years, requiring indoor, outdoor, and commercial, industrial, and institutional water use goals, water loss standards, annual water budgets, and documented preparation for long-term water shortages. All the water use goals together will form a total urban water use objective specific for each water agency. The Department of Water Resources (DWR) has provided recommended standards for indoor residential water use, and other urban water use goals are currently being developed and are expected to be released in late 2021. The State Water Resources Control Board is anticipated to adopt the element that includes the total water use objective in 2022, and agencies will begin reporting their water use in accordance with their urban water use objective beginning in 2024, with compliance anticipated by 2027. Because most of the water use goals are unknown, and none has been adopted by the State, the City's total urban water use objective is unknown and was not incorporated into the demand projections herein. However, the City is tracking the water use efficiency standards and goals and is aware it may need to implement additional conservation above what is presented in these projections to meet its total urban water use objective as mandated by the State in the future. The City is considering these higher conservation demand projections within a demand envelope in the current Metro Plan update.

4.2.5 Characteristic Five-Year Water Use

A new component of the UWMP is to prepare a five-year drought risk assessment (DRA) to evaluate water service reliability for a drought lasting five years from 2021–2025. The five-year DRA assumes potable water demand is unconstrained, and the City will continue to meet all projected potable demands. The raw water demand varies based on the availability of surface water supplies for groundwater recharge. The recycled water supply is not impacted by the drought, and recycled water demands are at normal year projections for the five-year drought. Projected water demands for years 2021–2025 for the DRA are included in **Section 7.2**.

4.3 Water Use for Lower Income Households

The Fresno Council of Governments (COG) prepared an update to the Regional Housing Needs Allocation (RHNA) to cover the period of January 1, 2015–December 31, 2023. The City subsequently developed its own Housing Element based on the COG RHNA for the planning period of December 31, 2015–December 31, 2023. The City's current Housing Element was adopted on April 13, 2017.

The City's Housing Element specifies the City will develop 8,955 new housing units through 2023 for extremely low, very low, and low income levels (City of Fresno Development and Resource Management Department, 2017). The City's Planning and Development Department prepares Housing Element Annual Progress Reports to report the progress of the RHNA and housing goals. The City of Fresno 2019 Housing Element Annual Progress Report details that 909 lower income units are approved or permitted (City of Fresno Planning and Development Department,

2020). The remaining number of lower income units needed over the RHNA 2013–2023 period, when subtracting the approved and permitted units, is 8,046.

Table 4-8 includes the Housing Element identified available single-family and multifamily acres to be developed and dwelling units for Extremely Low, Very Low, Low, Moderate, and Above Moderate income levels (City of Fresno Development and Resource Management Department, 2017). This data was used to determine the number of acres of both single-family and multifamily land use that needs to be developed by 2023 to meet the remaining 8,046 lower income units target for RHNA. The identified acres needed for low-income development by 2023 was applied to the average water demand factor for single-family and multifamily land uses to project the lower income water demands through 2023 to meet RHNA, shown in **Table 4-8**.

Table 4-8. Lower Income Dwelling Units and Acres to be Developed through 2023 and Estimated Water Demand

FRESNO HOUSING ELEMENT	SINGLE-FAMILY RESIDENTIAL	MULTIFAMILY RESIDENTIAL	TOTAL
Acres Available for Low-Income Development	3,163.6	1,310.9	4,474.5
Total Dwelling Units	13,457	21,526	34,983
Dwelling Unit per Acre	4.25	16.42	
Dwelling Unit Needed to Meet RHNA	3,095	4,951	8,046
Acres to be developed to Meet RHNA	727.6	301.5	1,029.1
Average Water Demand Factor (AF/ Acre)	2.54	5.13	
Low-Income Demand to meet RHNA from years 2020 – 2023 (AF)	1,847	1,545	3,392
Annual Low-Income Demand to meet RHNA (AFY)	**462**	**386**	**848**

Based on the estimated low-income water demand to meet the RHNA requirements by 2023, the annual projected low-income households demand is 462 AFY for single-family residential and 386 AFY for multifamily residential. For the purposes of this plan, the current RHNA projected low-income growth and water demands was applied through the UWMP planning period of 2045 and is presented in **Table 4-9**. However, lower income demands beyond 2023 will be based on the next Housing Element and RHNA Update expected in 2023 and may change in the future. All housing units and associated population are included in the adopted General Plan, and the demands for these units that occur within the water service area boundaries are included in the future water demands presented in this plan.

Table 4-9. Lower Income Household Projected Water Demands

LOW INCOME DEMAND	2025	2030	2035	2040	2045
Single-Family Residential Demand	2,308	2,308	2,308	2,308	2,308
Multifamily Residential Demand	1,932	1,932	1,932	1,932	1,932
TOTAL (AF)	**4,240**	**4,240**	**4,240**	**4,240**	**4,240**

4.4 Climate Change Considerations

Climate change impacts were considered in the North Kings Groundwater Sustainability Plan (NKGSP) based on DWR's Guidance for Climate Change Data Use during Groundwater Sustainability Plan (Department of Water Resources, 2018) and the related Sustainable Groundwater Management Act climate change website.[1] As documented in the NKGSP, the DWR climate change datasets were developed for the California Water Commission's Water Storage Investment Program (WSIP), are consistent with other DWR programs, are based on the best available science, build on previous efforts, incorporate the latest advances in projections, and follow the Climate Change Technical Advisory Group guidance (Provost & Pritchard, November 2019).

Changing precipitation and evapotranspiration (ETo) rates are expected to have the greatest impact on future demands, especially for outdoor water use. The WSIP climate change data sets estimate minimal changes to precipitation due to climate change from the historic period. The same datasets predict the ETo rate estimates with climate change will increase 3% by 2030 and up to 8% by 2070. More specifically, the ETo rate is predicted to increase the most in typically low ETo months (winter) and when irrigation is limited. The ETo rate is also predicted to be only slightly higher than historic in warmer months during the irrigation season. While higher ETo rates would increase irrigation demands, they are not anticipated to substantially impact the City's urban water use. The climate change impacts to supply sources are discussed in the supply chapter of **Section 6.8.2.1**.

[1] https://data.cnra.ca.gov/dataset/sgma-climate-change-resources

CITY OF FRESNO

5 SBX7-7 Baseline, Targets and 2020 Compliance

Senate Bill x 7-7 (SBx7-7) was signed into law in 2009 and requires the State to achieve a 20% reduction in per capita water use by December 31, 2020, with an interim target of 10% reduction by December 31, 2015.

IN THIS SECTION

- Baselines & Targets
- 2020 Compliance

The legislation requires each urban water supplier to develop and include in its Urban Water Management Plans (UWMPs) estimates of: 1) *baseline* daily per capita water use; 2) daily per capita water use *target*; 3) daily per capita water use *interim target*; and 4) *compliance* daily per capita water use. The UWMP must also include the basis for determining the estimates, with references to supporting data.

The Department of Water Resources (DWR) developed the Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use Guidebook (GPCD Methodologies Guidebook) to provide appropriate methodologies and criteria guidance (California Department of Water Resources, Feb 2016).

The baseline and 2020 per capita water use targets were calculated in the 2015 UWMP and are provided in **Appendix C**. There have not been significant changes in the City's service area since 2015, thus the calculations included in the 2015 Plan are still valid for compliance in this 2020 UWMP.

5.1 General Requirements for Baseline and Target

Methodologies consistent with those described in the GPCD Methodologies Guidebook were used to develop baselines and targets. The selected procedure used to develop the required SBx7-7 estimates includes the following basic steps:

1. Calculate baseline water use, which is the average gross daily water use per capita, reported in gallons per capita per day (GPCD), based on gross water use and service area population for a continuous 10-year period ending no earlier than December 31, 2004.
2. Calculate urban water use target using one of the four methods described below.
3. Check and confirm the urban water use target using the five-year running average.
4. Calculate the interim urban water use target (equal to the average of the baseline and confirmed urban water use target).
5. Calculate the compliance daily per capita water use (equal to the gross daily water use per capita during the final year of the reporting period).

DWR allows the urban water supplier to choose one of four different methods to calculate the urban water use target in Step 2 above.

- **Method 1** involves calculating the target based on 80% of baseline daily per capita water use and the interim target based on 90% of the baseline daily per capita water use.
- **Method 2** involves calculating the per capita daily water use by using the sum of performance standards applied to indoor residential use, landscaped area water use, and commercial, industrial, and institutional uses.
- **Method 3** calculates the water use target as 95% of the applicable state hydrologic region target as stated in the draft 20x2020 Water Conservation Plan.
- **Method 4** is an approach developed by DWR that uses a spreadsheet to calculate estimated water savings factors to estimate targets.

The City selected Method 1 for determining its 2015 Interim and 2020 Final urban water use targets during the preparation of its 2010 UWMP. This selection was made after reviewing the four alternative methods available. Rather than duplicating the evaluation for this plan update, the reader is directed to Appendix I of the City's 2010 UWMP for details, as the previous City adopted evaluation is still applicable and results in the same target method selection.

5.2 Service Area Population

The City's 2020 service area population was estimated using the DWR Population Tool consistent with DWR Methodology 3 (Service Area Population) and the 2015 UWMP. Shapefiles of the City's water service area were loaded into the DWR Population Tool along with available residential service connection numbers to develop service area populations for the corresponding census years. The DWR Population Tool, provided in **Appendix F**, estimated the City's water service area population is 550,217. The DWR Population Tool provides a population based on the 2000 and 2010 census data and, published effective as of April 1 of the census year, the water service area during each census year and the number of water service connections. For the 2020 population, the number of services from December 31, 2020, was used, and the 550,217 population is estimated as of the end of 2020.

5.3 Gross Water Use

The City's gross water use is comprised of surface water contracted for delivery of allocated supplies from USBR and FID and groundwater produced by its municipal wells. The basis of gross water use are the meters installed at the City's North Fresno Wastewater Reclamation Facility, Southeast Surface Water Treatment Facility, and T-3 Water Storage and modular Surface Water Treatment Facility, and each of its municipal groundwater wells, which are equipped with flow meters. DWR Methodology 1 (gross water use) provides the opportunity to make adjustments and deductions in the reported gross water use for factors such as: meter errors, changes in distribution storage, indirect recycled water use, agricultural water use, and process water use. The City's gross water use has not been adjusted for any of these factors. Therefore, the total water use shown in **Table 4-2** is the City's gross water use.

5.4 Baselines and Target Summary

The City's 2015 UWMP reviewed and updated the 10-year and five-year Baseline Daily Per Capita Water Use and 2020 Target, included in **Table 5-1**. The continuous time period used in the 2015 UWMP for the 10-year baseline period is 1999–2008 and has an associated average daily per capita water use of 309 GPCD. The continuous time period that was used in the 2015 UWMP for the five-year target confirmation baseline period was 2003–2007, which has an associated average daily per capita water use of 304 GPCD. The confirmed 2020 target was established as a 20% reduction from the 10-year baseline per capita use and is 247 GPCD. Refer to **Chapter 5** of the City's 2015 UWMP for more information on how the baselines and targets were developed.

Table 5-1. Per Capita Water Use Baseline and 2020 Target

BASELINE PERIOD	TIME PERIOD	AVERAGE BASELINE GPCD (GPCD)	CONFIRMED 2020 TARGET (GPCD)
10 Year	1999 – 2008	309	247
5 Year	2003 – 2007	304	

5.5 2020 Compliance Daily Per-Capita Water Use (GPCD)

This section presents the procedure used to meet the requirements of SBx7-7 as defined in the Water Conservation Act of 2009 as incorporated into Division 6 of the California Water Code, commencing with Section 10608 of Part 2.55.

5.5.1 Meeting the 2020 Target

The determination of 2020 target compliance is based on gross water use for the 2020 calendar year, which was 121,993 acre-feet (see **Table 4-2**), and a service area population of 550,217 as of December 31, 2020 (see **Table 3-1**). The resultant actual per capita water use for the City in 2020 was 198 GPCD. As such, the City has met and exceeded the 2020 target of 247 GPCD.

The overall water usage patterns of the City have been greatly reduced due to its conservation measures and metering of all services. Prior to January 2013, nearly all of the City's single-family residential water customers had been billed on a monthly flat rate structure; they were unaware of the water they actually used and had no real incentive to conserve water. As of January 2013, the City has completed its residential water meter program, which installed approximately

113,000 water meters for single-family homes. With the completion of this program, all the City's water service connections are now metered, and the City and its customers can work more closely together to optimize water use. Since completion of the project, residential water demands have dramatically decreased. Attainment of the 2020 target has been influenced by the City's investments in metering and the proactive conservation education and outreach to customers. These factors have played a significant role in the City's ability to meet and surpass the 2020 target. In the future, the City will need to remain diligent in monitoring water use and continuing incentive programs to further reduce water consumption. These efforts are necessary so when the current strict reduction requirements are lifted, all water users remain diligent in avoiding unnecessary use of water and upgrade fixtures to eliminate water wasting.

5.5.2 2020 Adjustments to 2020 Gross Water Use

No extraordinary events or economic adjustments have taken place that would cause any adverse effects with regards to overall water usage. As was previously mentioned, the City did not make any adjustments to the 2020 gross water use as is permissible with Water Code 10608.24 cited above.

6 CITY OF FRESNO Water Supply Characterization

This chapter identifies and quantifies, to the extent practicable, the existing and planned sources of water supplies for the City through 2045.

The City relies on groundwater from the North Kings Subbasin; surface water from Central Valley Project (CVP), through a contract with the United States Bureau of Reclamation (USBR); Kings River water, through a contract with Fresno Irrigation District (FID); and recycled water. This chapter also provides a discussion of supply availability and reliability under normal supply conditions (normal water year), during a single dry year, and for a drought lasting five years.

IN THIS SECTION

- Groundwater
- Surface Water
- Recycled Water
- Projected Water Supply

Water production in the City has consisted of 100% groundwater prior to the commissioning of the City's first surface water treatment facility (SWTF) in 2004. Since 2004, the City has invested in expanding its surface water treatment capabilities and now has three SWTFs that provide approximately half of all potable water demands in the service area.

6.1 Groundwater

The City overlies the Kings Subbasin, which is part of the greater San Joaquin Valley Groundwater Basin. The City is one of many water purveyors that use groundwater from the Kings Subbasin. The City has a network of over 270 municipal wells and currently operates approximately 202 municipal supply wells within the Kings Subbasin. Until late 2004, the City relied solely on groundwater to meet the water demands. The City's desire is to continue to use groundwater within a larger conjunctive use program that maximizes its existing water rights and surface water supply sources.

6.1.1 Basin Description

The Department of Water Resources (DWR) has partitioned the State into 10 major hydrologic regions (also referred to as "basins") and then further divided each basin into subbasins. The City is located in the Kings Subbasin (DWR Groundwater Subbasin Number 5-22.08) and lies within the larger San Joaquin Valley Groundwater Basin in the Central Valley of California. The Kings Subbasin covers approximately 1,530 square miles (sq mi).

6.1.1.1 Basin Location

The San Joaquin Valley Groundwater Basin is bounded to the north by the Sacramento-San Joaquin Delta and Sacramento Valley, to the east by the Sierra Nevada Mountains, to the south by the San Emigdio and Tehachapi Mountains, and to the west by the Coast Ranges. The Kings Subbasin, located within the southern half of the San Joaquin Valley Groundwater Basin, is bounded to the north by the San Joaquin River, to the east by the alluvium-granite rock interface of the Sierra Nevada foothills, to the south by the southern fork of the Kings River, and to the west by the Delta-Mendota and Westside Subbasins (California Department of Water Resources, January 2006). The Kings Subbasin is split into seven Groundwater Sustainability Agency (GSA) management areas, with Fresno located in the North Kings GSA. **Figure 6-1** illustrates the location of the City within the Kings Subbasin.

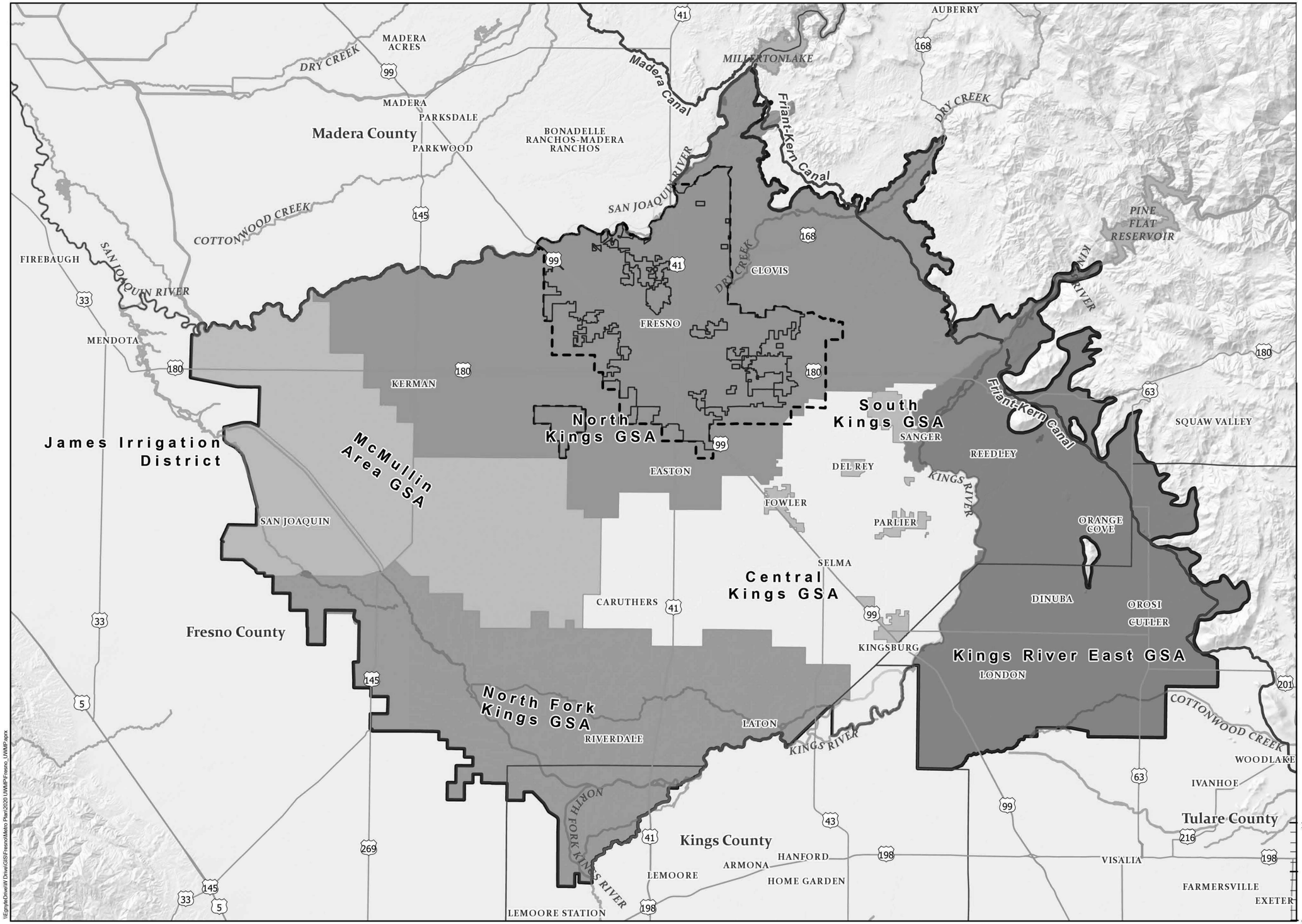
6.1.1.2 Area Geology

The upper several hundred feet of geology within the Kings Subbasin generally consists of highly permeable, coarse-grained deposits, which are termed older alluvium. **Figure 6-2** presents an idealized hydrogeologic cross-section that illustrates the general depth of various lithologic features within the Kings Subbasin, near the City.

Coarse-grained stream channel deposits, associated with deposits by the ancestral San Joaquin and Kings Rivers, underlie much of northwest Fresno (Layer 3 and 4 in **Figure 6-2**). There is a laterally extensive clay layer, at an average depth of approximately 250 feet below the ground surface, beneath most of the south and southeastern portions of the City.

Below the older alluvium, to depths ranging about 600–1,200 feet below ground surface, the finer-grained sediments of the tertiary-quaternary continental deposits are typically encountered (Layer 5 in **Figure 6-2**). Substantial groundwater has been produced and utilized from these depths by the City. However, deeper deposits located in the southeastern and northern portions of the City have produced less groundwater.

There are also reduced deposits in the northern and eastern portions of the City, at depths generally below 700 or 800 feet, which are associated with high concentrations of iron, manganese, arsenic, hydrogen sulfide, and methane gas. Groundwater at these depths does not generally provide a significant source for municipal supply wells.

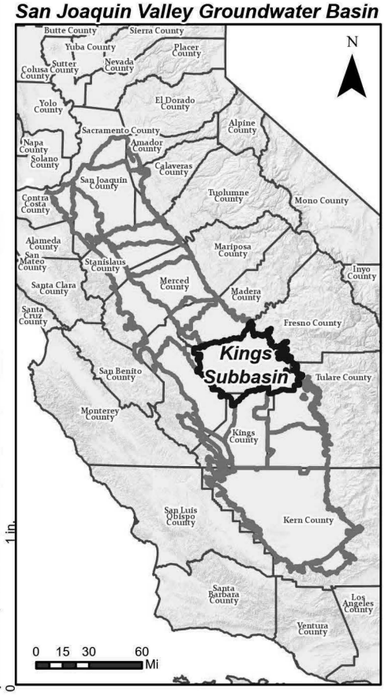


Legend

Groundwater Sustainability Agency

- Central Kings GSA
- James Irrigation District
- Kings River East GSA
- McMullin Area GSA
- North Fork Kings GSA
- North Kings GSA
- South Kings GSA
- Fresno City Limits
- Fresno Sphere of Influence
- Kings Groundwater Subbasin
- Major Watercourses
- Lakes and Reservoirs
- County Boundary
- Canal

San Joaquin Valley Groundwater Basin



Prepared by: WSC

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References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum North American 1983

Notes:

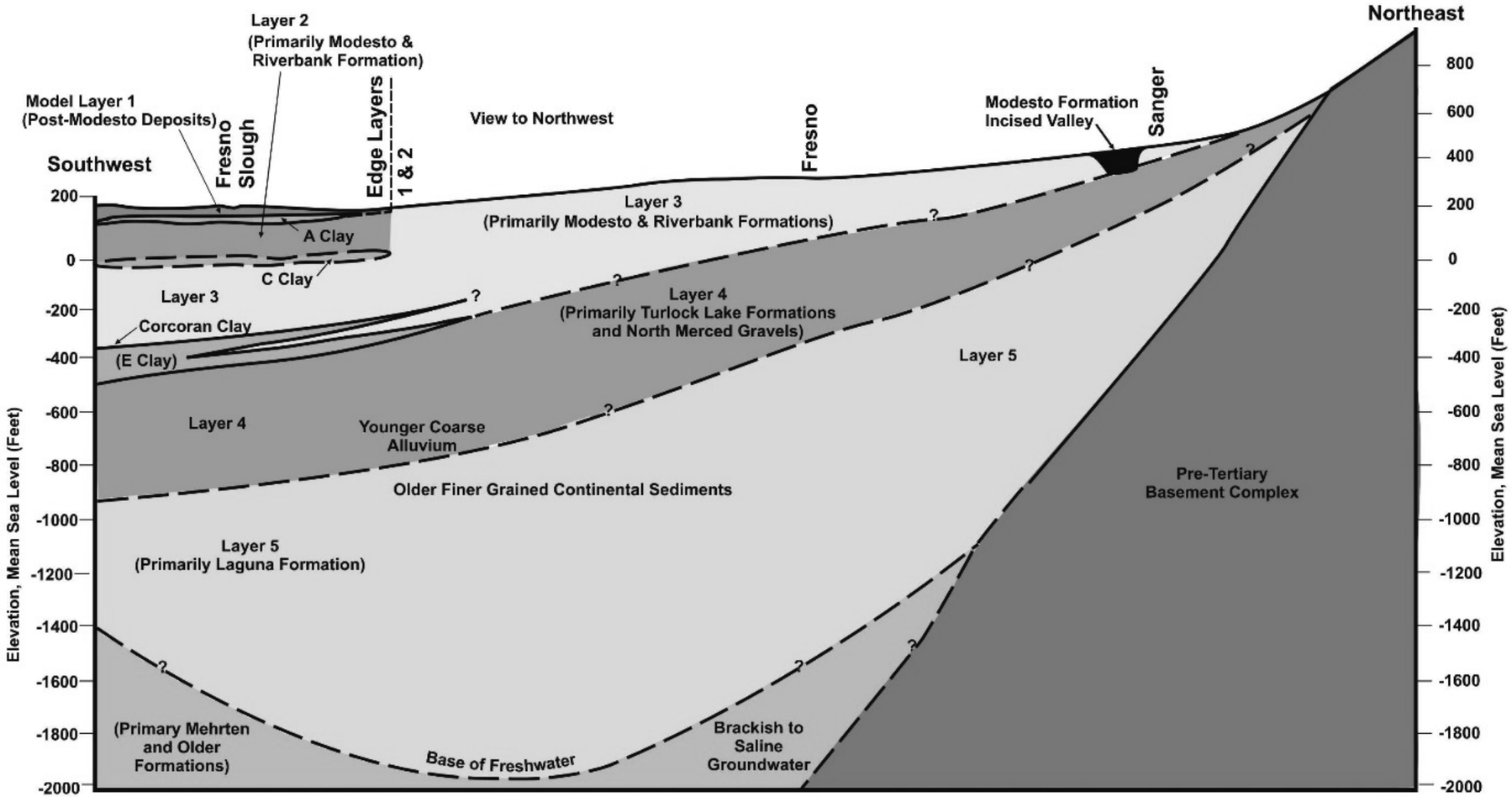
Prepared for: City of Fresno, Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-1. Kings Subbasin

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Figure 6-2. Kings Groundwater Subbasin Conceptual Hydrogeologic Cross-Section, Southwest-Northeast



Primary Sources

Croft, 1969
Muir, 1977
Lettis, 1982
Page and LeBlanc, 1969
Cehrs, et. al. 1980
Wiseman, et. al: 2002b

Figure from *Kings Basin Integrated Hydrologic Modeling Hydrogeologic Investigation Technical Memorandum*, dated February 2006, prepared by Brown & Caldwell and Wrime.

6.1.1.3 Aquifer Characteristics

The aquifer beneath the City was characterized using data compiled during aquifer tests performed at the City's production wells. As part of updating the detailed hydrogeologic evaluation, aquifer test data (pump tests) were reviewed to update the hydrogeologic analysis and evaluate the specific capacity data. The specific capacity indicates the ability of a particular well to produce water. **Figure 6-3** presents the estimated specific capacity of each active well from early 2020 pump test data. As shown in the figure, the northwestern and southwestern portions of the City have wells with higher specific capacities.

6.1.2 Groundwater Management

In 2014, a three-bill legislative package was signed into law, composed of Assembly Bill 1739, Senate Bill (SB) 1168, and SB 1319, collectively known as the Sustainable Groundwater Management Act (SGMA) of 2014, which is codified in Section 10720 et seq. of the California Water Code. This legislation created a statutory framework for groundwater management in California that can be sustained during the planning and implementation horizon without causing undesirable results. SGMA requires governments and water agencies of "critically overdrafted" basins to reach sustainability by 2040. The Kings Subbasin was designated a critically overdrafted basin in the DWR's Bulletin 118. The North Kings GSA is working within the SGMA framework to reach groundwater sustainability.

The City was a founding member of the North Kings GSA, which consists of the following public agencies and participating agencies:

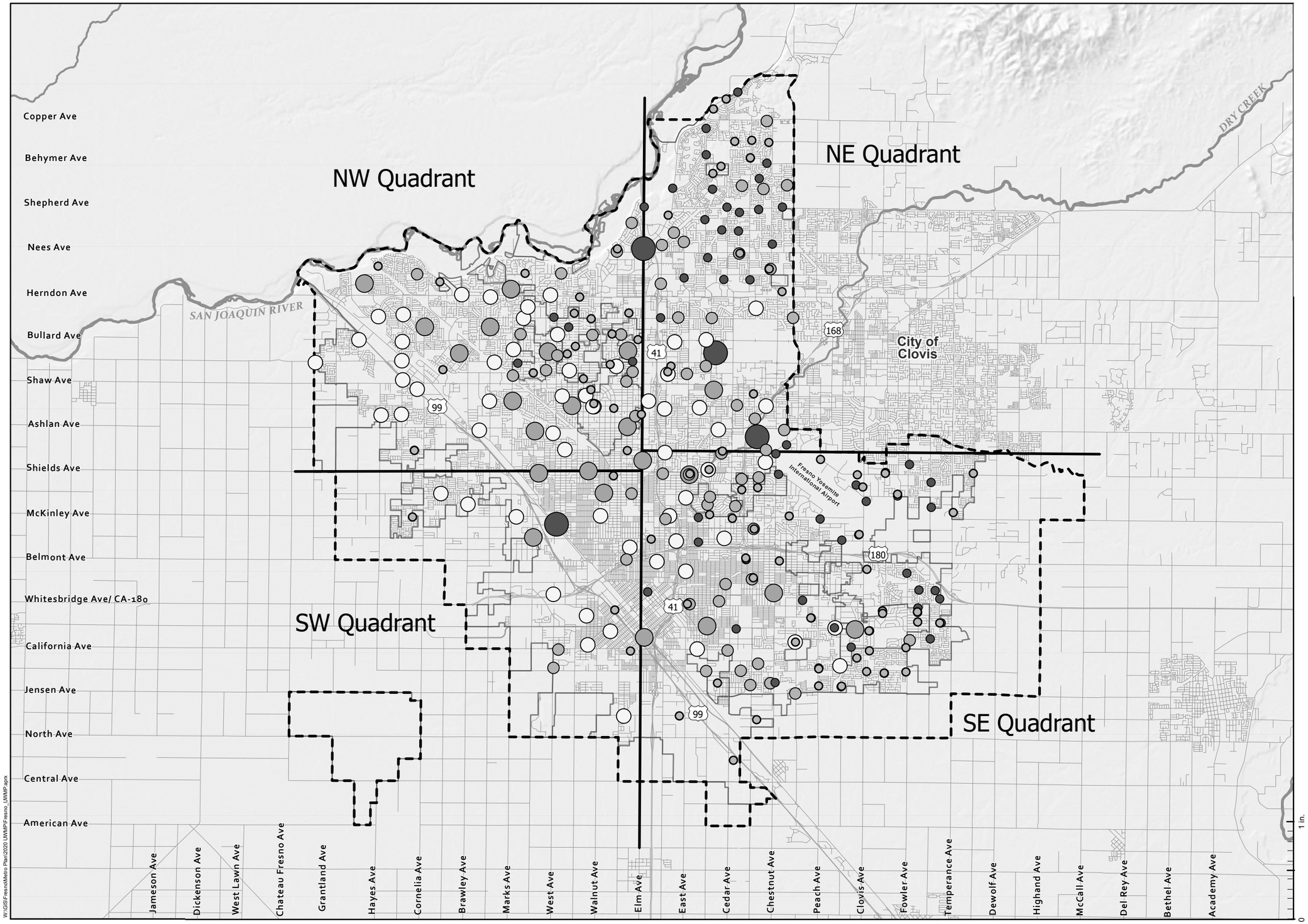
- Fresno Irrigation District (member)
- City of Fresno (member)
- City of Clovis (member)
- City of Kerman (member)
- County of Fresno (member)
- Bakman Water Company (participating agency)
- Biola Community Services District (member)
- Garfield Water District (member)
- International Water District (member)
- Fresno Metropolitan Flood Control District (participating agency)

The Kings Subbasin contains seven GSAs, including the North Kings GSA, as listed below and shown in Figure 6-1:

- Central Kings GSA
- James Irrigation District GSA
- Kings River East GSA
- McMullin Area GSA
- North Kings GSA
- North Fork Kings GSA
- South Kings GSA

The seven GSAs operate cooperatively across the basin via a coordination agreement that ensures common approaches to sustainability items such as similarity of data usage and methodologies, consistent interpretations of the basin setting, and common assumptions and development of water budgets, monitoring networks, sustainable management criteria and data management systems.

The North Kings GSA prepared and submitted its GSP in January 2020 (Provost & Pritchard, November 2019) and is awaiting DWR review by January 2022.



Legend

Well Specific Capacity (gpm/ft)

- Unknown
- < 20
- 20 - 50
- 50 - 100
- 100 - 200
- 200 - 450
- Groundwater Quadrant Divide
- Fresno Sphere of Influence
- Fresno City Limits
- Streets

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Prepared by:

WSC

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References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

1. Well specific capacity was provided by the City and calculated using 2020 data.

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City of FRESNO
Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-3. City Wells Specific Capacity

As required by SGMA, the North Kings considers six sustainability indicators:

- Chronic lowering of groundwater levels indicating significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degraded water quality
- Significant and unreasonable land subsidence
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

Each indicator has an identified undesirable result, measurable objective, and minimum threshold. The measurable objective and minimum threshold allow the North Kings GSA to evaluate their progress for the subject indicator and determine if conditions are improving, remaining stable or degrading. The sustainability indicators of primary concern within the City are groundwater levels, groundwater storage, and groundwater quality. The methodology for the water quality indicators has been developed and the methodology is still being developed for the groundwater levels and groundwater storage indicators. A copy of the GSP is provided in **Appendix G** of this UWMP[1].

6.1.3 Overdraft Conditions

SGMA directs DWR to identify groundwater basins and subbasins in conditions of critical overdraft. As defined by SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." As mentioned, DWR classifies the Kings Basin as being in a state of critical overdraft in its Bulletin 118, and the future of the groundwater basin has been projected to see continued overdraft conditions.

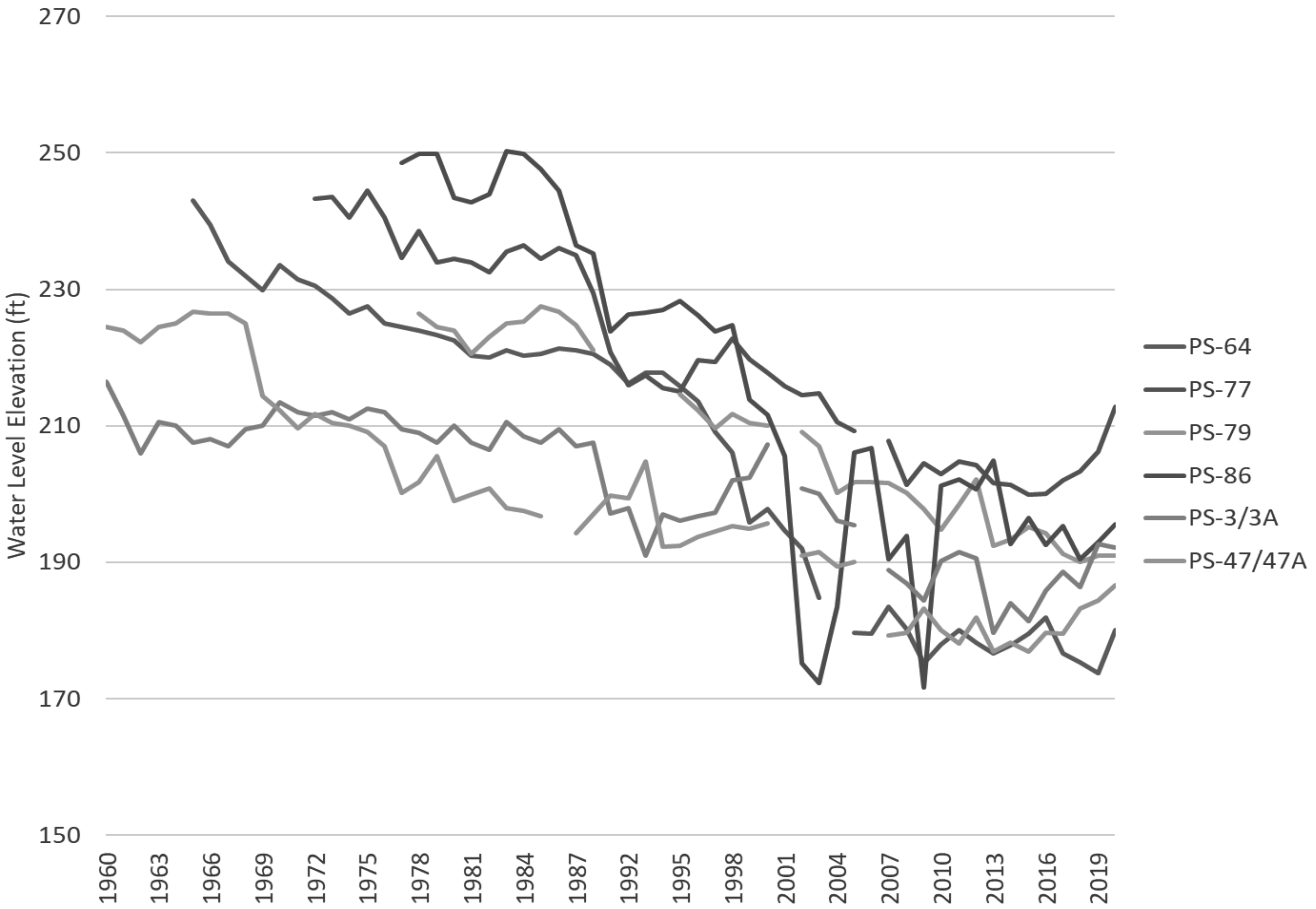
The Kings Subbasin groundwater aquifer supplies the City, other municipalities, agriculture, and rural residential areas with a consistent source of water. Like much of the Kings Subbasin, groundwater levels beneath the City were relatively shallow at 25 feet below ground surface in 1940, prior to the start of World War II (Fresno City Water, Engineering Department, 1940). After the war, the State, including the City, began growing at a rapid rate. For the period from 1959 to 1968 it was reported groundwater levels declined at a rate of 2.8 feet per year (John Carollo Engineers, 1969). The City continued to rely on the groundwater aquifer for decades, monitoring groundwater levels continuously. Groundwater levels since 1990 have declined at a lower rate than previously. Rates of decline slowed further starting in 2004 when the Northeast Surface Water Treatment Facility (NESWTF) started operations and the City renewed focus on increasing groundwater recharge. In 2019 and 2020, surface water accounted for more than half of the total water supply in the City. With the reduced pumping due to higher reliance of surface water, the groundwater levels have begun to increase in certain areas of the City in the last few years. **Figure 6-4** provides a depiction of the City's depth to groundwater for six representative wells across the Sphere of Influence (SOI) since 1960.

The City expects to continue to operate its three SWTFs and pump groundwater at a lower rate than historically so that the groundwater basin can recover. One of the primary objectives for the City as described in its current Metro Plan is to maximize the use of available surface water

[1] Available at https://www.northkingsgsa.org/groundwater-sustainability-plan/

treatment supplies to reduce overall reliance on groundwater. Additionally, as described in **Chapter 4**, the City plans to continue their groundwater recharge program to protect the groundwater basin. **Figure 6-5** shows the active and proposed recharge basins and FID Canals the City utilizes as part of groundwater recharge program.

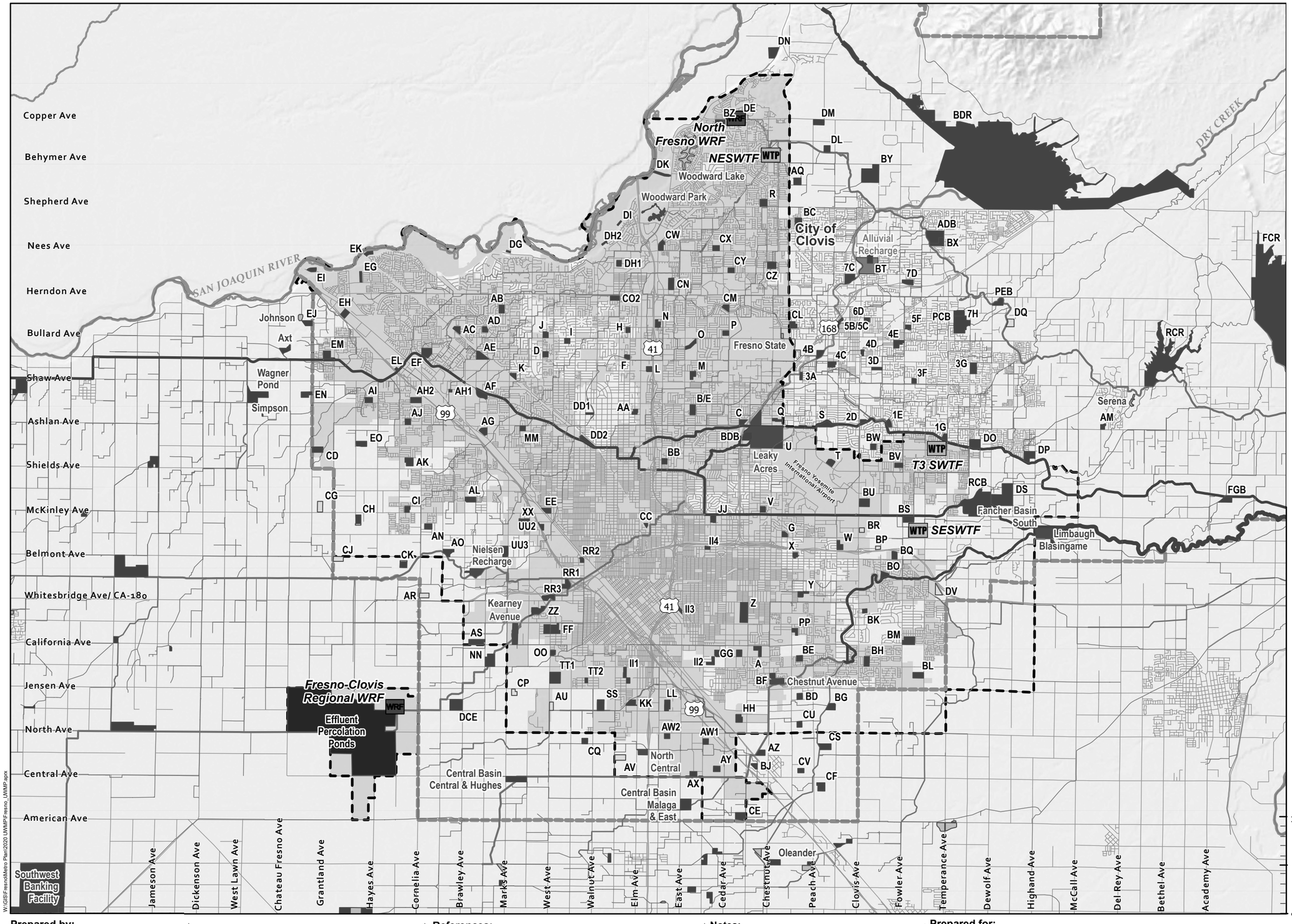
Figure 6-4. Time Series of Groundwater Levels at Representative Wells



6.1.4 Groundwater Quality

Groundwater within the North Kings Subbasin generally meets primary and secondary drinking water standards for municipal water use and is described as being bicarbonate type water, including calcium, magnesium, and sodium as the dominant ions (California Department of Water Resources, January 2006). Total dissolved solids (TDS) concentrations rarely exceed 600 mg/L and range from 200 to 700 mg/L (California Department of Water Resources, January 2006). However, the groundwater basin has been impacted by multiple chemical contaminants that affect the City's ability to fully utilize the groundwater basin resources without some type of wellhead treatment in certain areas.

Figure 6-6 presents the general location of regional plumes and major point sources within the City. The primary contaminants are nitrate, 1,2-dibromo-3-chloropropane (DBCP), 1,2,3-trichloropropane (1,2,3-TCP), and other volatile organic compounds like trichloroethylene (TCE) and and perchloroethylene (PCE). The City has received settlements in a number of lawsuits related to these contaminants and has constructed wellhead treatment systems and implemented blending plans for a number of wells.



Legend

Groundwater Recharge Basins

- FID Basin
- Privately Owned Basin
- City of Clovis Basin
- City of Fresno Basin
- RWRF Effluent Percolation Area
- FMFCD Basin
- FMFCD Proposed Basin
- FMFCD Boundary
- Wastewater Reclamation Facility (WRF)
- Water Treatment Plant (WTP)

FID Facilities by Capacity

- Less than 35 cfs
- 35 - 150 cfs
- 150 - 350 cfs
- 350 - 900 cfs
- 900 - 1500 cfs

- Fresno Sphere of Influence
- Fresno City Limits
- Streets

Recharge Basin Summary

Owner/ Operator	No. of Basins	Total Area (acres)
FID	25	2,900
Private Owner	8	300
City of Clovis	1	90
City of Fresno	11	450
City of Fresno RWRF	---	2,000
FMFCD (Existing)	166	8,500
FMFCD (Proposed)	12	140

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Prepared by: WSC

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References:

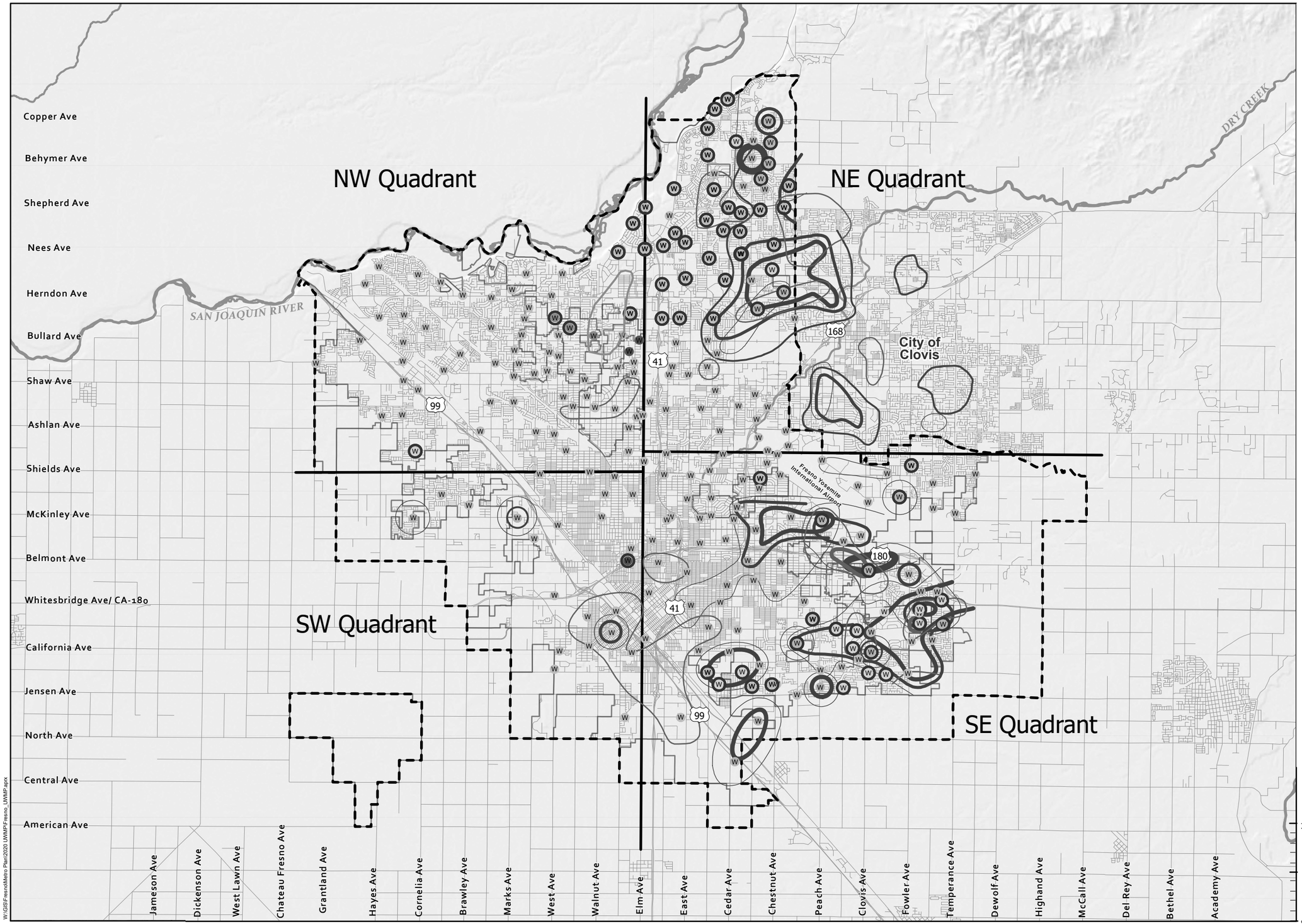
1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-5. Groundwater Recharge System



Legend

Nitrate-Nitrogen Contamination and Concentration

- 5 mg/L
- 10 mg/L

DBCP Contamination and Concentration

- 0.01 ppb
- 0.02 ppb
- 0.05 ppb
- 0.1 ppb
- 0.2 ppb

1,2,3-TCP Contamination and Concentration

- 5 ppt
- 10 ppt
- 20 ppt
- 50 ppt
- 100 ppt

Other Plumes

- TCE Plume
- EDB Plume (old)

Well Pumped to Control Contaminant Plumes

- DBCP
- PCE
- TCE
- TCP
- No Minimum Pumping
- Well Head Treatment
- Groundwater Quadrant Divide
- Fresno Sphere of Influence
- Fresno City Limits
- Streets

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References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

1.A list of wells with treatment was provided by the City as of September 2020. Some wells share treatment and convey water via a raw water pipeline to another well's treatment site. Wellhead treatment types includes activated carbon for VOC/SOCs, air stripping for VOCs, blending, degassing tank, corrosion control treatment, H2S odor control, and manganese treatment, or a combination of such.

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Department of Public Utilities

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Figure 6-6. Regional Groundwater Contamination

Approximately 40 City wells are being treated for contaminants such as PCE, DBCP, TCE, 1,2,3-TCP, perfluorooctanoic acid, perfluorooctanesulfonic acid, ethylene dibromide, and nitrate, and an additional 20 wells include treatment for iron, manganese, and hydrogen sulfide removal or corrosion control.

As shown in the figure, extensive groundwater contamination nearly covers the City's entire water service area; only areas located in the northwest appear to be relatively unaffected by regional groundwater contamination. Also, many of the City's wells are impacted by one or more of the contaminant plumes (indicated by the presence of overlapping plumes on the figure). The figure also shows the approximately 93 existing active wells that are impacted by at least one contaminant plume and the 60 existing wells with wellhead treatment. The City is also managing contamination from spreading by pumping specific wells to control the plumes.

6.1.5 Estimated Groundwater Yield

As part of the ongoing Metro Plan update, the City is developing a storage accounting framework to estimate groundwater yield. The storage framework will track the City's groundwater recharge, pumping, and flows into and out of the City's SOI and incorporate bi-annual monitoring well water level readings on a grid basis. This work is ongoing, and the City reserves the right to update this analysis with more recent data when available.

Currently, the best available information on the City's groundwater yield is from a hydrologic groundwater and surface water model that was prepared for the Upper Kings Basin Integrated Regional Water Management Authority. The City contributed additional funding to the effort so the model would be more refined for its service area and capable of assisting in the development of the City's previous Metro Plan. The Kings Basin Integrated Groundwater and Surface Water Model (IGSM) was completed in 2007 and provided outputs specific to the City SOI (WRIME, 2007). The IGSM was developed and calibrated utilizing data for the period of 1964–2004. Building off the calibrated IGSM, additional modeling was conducted in 2008 to evaluate the City's proposed water supply plan and its ability to attain the balanced use of groundwater by the buildout year of 2025. The estimated groundwater yield within the City's SOI presented in this section is based on the modeling efforts to establish the various natural elements of the underlying aquifer.

6.1.5.1 Natural Recharge

As a result of the IGSM effort, the long-term average deep percolation from rainfall and irrigation-applied water for the period of 1964–2004 was found to be 42,700 acre-feet per year (AFY) for the entire SOI (West Yost Associates, January 2014). However, as urbanization continues within the SOI, the amount of deep percolation will decline because of increased runoff and less open land for natural recharge. For 2005, it was estimated deep percolation would be about 37,000 AFY and would reduce annually, ultimately declining to and remaining at 27,000 AFY by buildout in 2025. The new General Plan now anticipates SOI buildout will occur in 2056. Holding the 2005 value of 37,000 AFY and extending the 27,000 AFY to 2056, intermediate values were straight-line interpolated. Additionally, the City currently covers 73,500 acres of the 100,277 acres within its SOI, representing 73% urbanization, which would approximate the City's water system service area. **Table 6-1** shows estimated natural recharge through 2045.

6.1.5.2 Net Subsurface Inflow

Again, utilizing information developed from the IGSM, average net subsurface inflow into the SOI was characterized as being 64,800 AF annually for the period of 1964–2004. Applying the

previously described 73% proportioning factor of the developed SOI area to overall SOI area, approximately 47,510 AFY would be attributed to the City's water service area in 2020. This value will increase in future years as the City annexes more land until the SOI is built out. **Table 6-1** shows the estimated subsurface inflows for future years based on the land use growth presented in **Figure 4-3**. The City has historically benefitted from the net subsurface inflows and requires these flows for replenishment necessary to maintain the sustainable yield of the groundwater aquifer system.

6.1.5.3 Intentional Groundwater Recharge

The City has long made efforts toward offsetting the decline of groundwater levels and minimizing overdraft conditions through an active intentional recharge program that started in 1971 (CH2MHill, 1992). Through cooperative agreements with Fresno Metropolitan Flood Control District (FMFCD) and FID, the City has access to not only City-owned basins, but also those of these two agencies. Utilizing available surface water supplies, the City recharged on average approximately 60,000 AFY from 2000–2019; however, with the reduction in available surface water supplies, intentional recharge declined to 34,700 AF in 2014 and 19,800 AF in 2015, followed by an increase in recharge in years 2016, 2017, and 2019 to help replenish the aquifer. In 2019, City recharge of 82,993 AF was the maximum annual recharge attained during this period. The City has averaged over 60,000 AFY the previous five years and plans to gradually increase recharge by about 540 AFY each year. However, during wet years the City will recharge more water when it is available to allow to the City to draw on additional groundwater during dry years when surface water is not available. Intentional recharge is included in the non-potable demand projections as well as contributing to the estimated groundwater yield presented in **Table 6-1**.

Table 6-1. Components to Groundwater Yield for Normal Years

	QUANTITY (AFY)					
GROUNDWATER COMPONENT	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Natural Recharge[1]	24,970	25,480	25,910	26,280	26,570	26,790
Net Subsurface Inflow[1]	47,510	49,910	52,320	54,720	57,120	59,530
SUSTAINABLE YIELD	**72,480**	**75,390**	**78,230**	**81,000**	**83,690**	**86,320**
Intentional Recharge[2]	60,000	62,700	65,400	68,100	70,800	73,500
TOTAL ESTIMATED GROUNDWATER YIELD	**132,480**	**138,090**	**143,630**	**149,100**	**154,490**	**159,820**

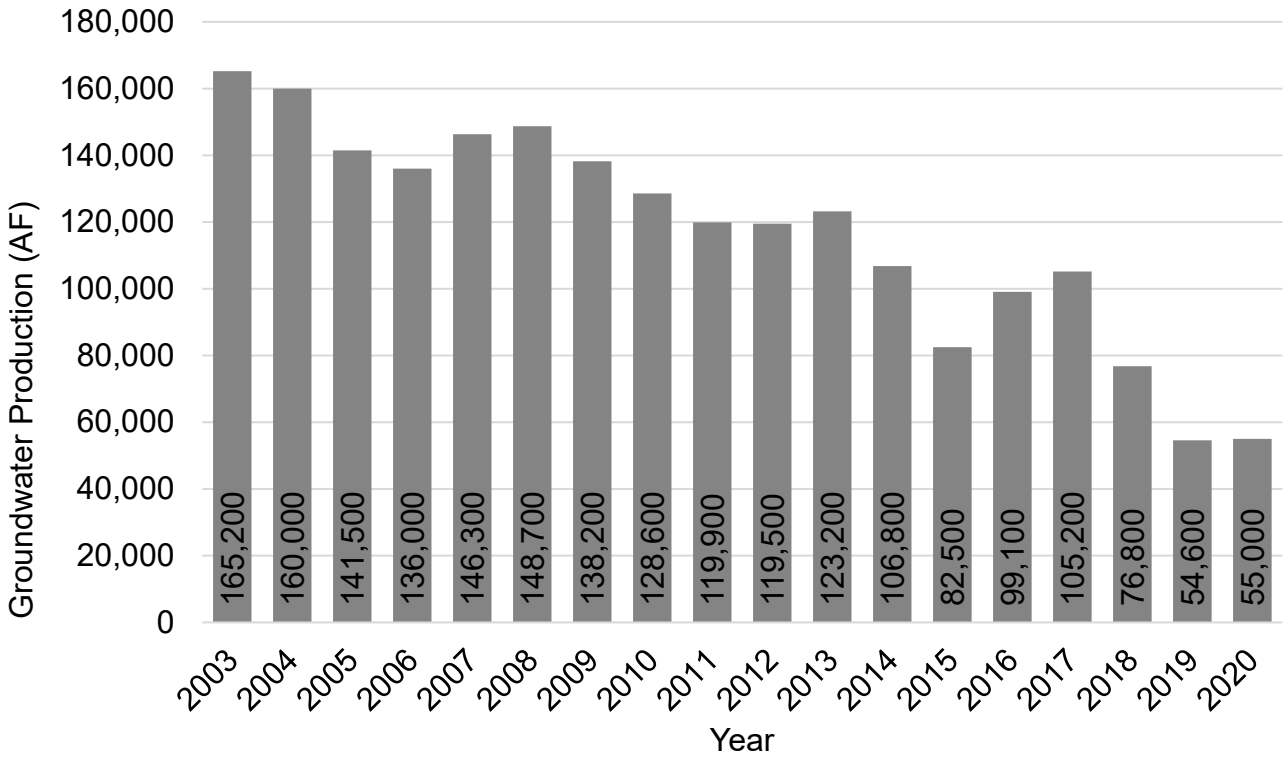
Notes:

1. Based on the Kings Basin IGSM and projected City land growth from **Figure 4-3** as discussed in **Section 3.1.1.**
2. Projected normal year intentional recharge from **Table 4-7**.

6.1.6 Historic Groundwater Pumping

The City has historically relied on groundwater as its main supply source prior to the construction of its SWTFs. With the recent investments in surface water infrastructure, the City has been able to drastically reduce its groundwater pumping. **Figure 6-7** shows the historic groundwater pumping since 2003. As shown, pumping has dropped significantly since 2003, the City's peak year for groundwater production.

Figure 6-7. Historic Groundwater Production



6.2 Surface Water

With the completion and operation of the Southeast Surface Water Treatment Facility (SESWTF), surface water is now a primary water supply used to meet potable demands within the City. The City contracts with FID for Kings River water and with the USBR for CVP water from the Friant-Kern Canal. The surface water supply is used either for potable uses through treatment and distribution or delivery to recharge basins for groundwater recharge.

The Kings River water year (WY) is October through September while USBR uses a WY of March through February. The City has historically used a calendar year (CY) for its analysis, so monthly water supply information was compiled in CY format for this report.

6.2.1 USBR Friant Division Contract Supply

The City, through an agreement originally executed in January 1961, secured a surface water supply from USBR CVP Friant Division. This agreement, for an annual water supply of 60,000 AF of Class 1 water, was last renewed in 2010 as a Section 9(d) contract that provides water from the San Joaquin River in perpetuity. A copy of the renewed contract is provided in

Appendix H of this UWMP. The USBR CVP Friant Division facilities generally include: Friant Dam (Millerton Reservoir), the Friant-Kern Canal, and the Madera Canal. The Friant-Kern Canal is maintained and operated by the Friant Water Authority. The USBR water supply is a wholesale supply.

Construction of Friant Dam was completed in 1947 and began making diversions to the Friant-Kern Canal in 1949. Full operations of the CVP Friant Division did not commence until the Madera Canal was completed in 1951. Class 1 water was intended to be a supply that would be dependable in practically every year, regardless of the type of hydrologic WY. Class 2 water is essentially excess water available as determined by USBR and less reliable than Class 1 water.

Class 1 water has historically been very reliable until the 2006 San Joaquin River Restoration Settlement Agreement between the Department of the Interior and Commerce, the Natural Resources Defense Council, and the Friant Water Users Authority (which is now the Friant Water Authority). The City is a member of the Friant Water Authority. The Settlement ended an 18-year legal dispute over the operation of Friant Dam brought by a coalition of conservation and fishing groups. The agreement characterized Class 1 deliveries by six hydrologic year types based on a recurrence over an 82-year simulation (1922–2003): wet, normal-wet, normal-dry, dry, critical-high, critical-low. The projected surface water available for the City from USBR during each hydrologic year defined by the 2006 Settlement Agreement is summarized in **Table 6-2**. As shown in the table, the average simulated delivery is 53,680 AFY and the median simulated delivery, which is similar to normal year delivery, is 60,000 AFY. The median value is higher than the average value because 100% allocation of 60,000 AF is simulated in 50 of 82 years but the dry and critical years result in substantial reductions, which bring down the average allocation.

The Settlement Agreement estimates the reduced supply available to the City compared to historic supplies, most evident in dry years. Restrictions on exports from the Delta have hindered the USBR from making deliveries to the Exchange Contractors via the Delta-Mendota Canal. The Exchange Contractors allowed the formation of the CVP Friant Division by agreeing to not exercise their historic pre-1914 water rights to the San Joaquin and Kings Rivers if guaranteed water deliveries continued through the Delta-Mendota Canal or other facilities. If USBR is unable to deliver water to the Exchange Contractors, they have the right to receive their water from the San Joaquin River, which reduces the Class 1 water availability (History of SJRECWA Exchange Contractors, n.d.).

Reduced deliveries from the Delta to the Exchange Contractors resulted in the CVP Friant Division contractors with zero allocations of Class 1 water in USBR WY 2014 and 2015, though the City received USBR deliveries in CY 2014 (prior to the USBR WY starting in March). Annual USBR deliveries since 2007 are shown in **Figure 6-8** for CY. The availability and reliability of the City's surface water supplies through its USBR contract are discussed further in **Chapter 7**.

Table 6-2. Available USBR Simulated Allocation (1922–2003)

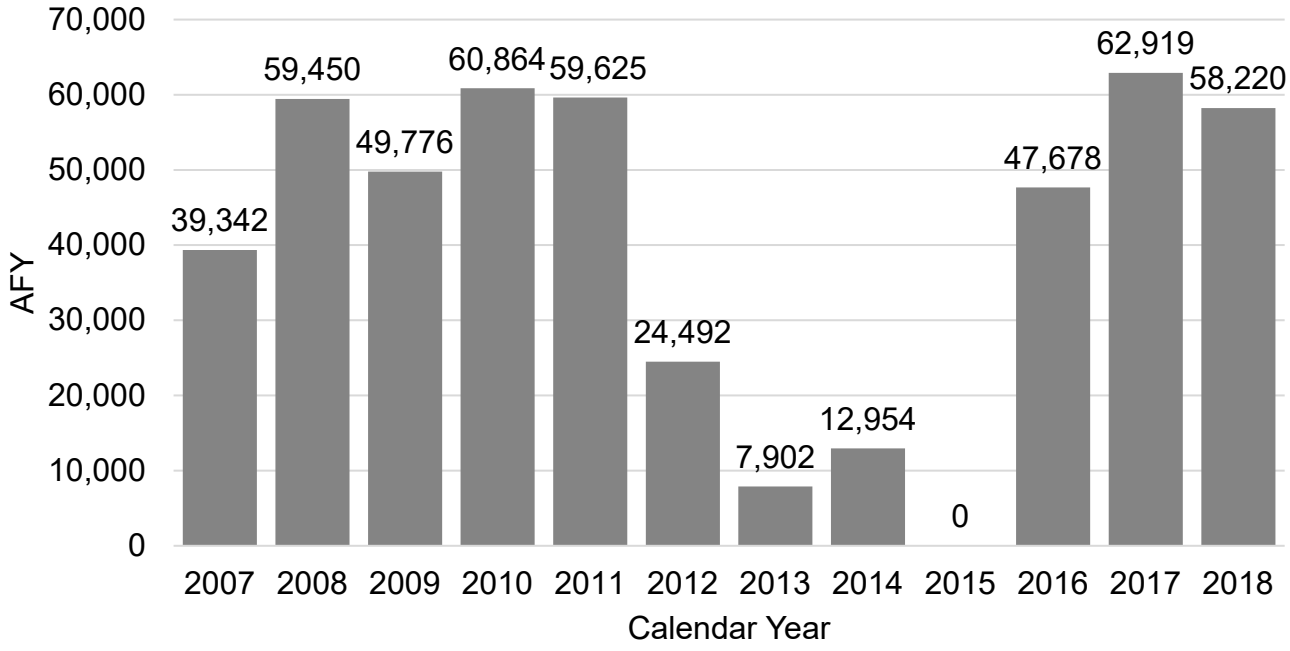
WATER YEAR TYPE	% OF YEARS OVER SIMULATION PERIOD OF DELIVERIES [1]	NUMBER OF YEARS IN THAT YEAR TYPE	RANGE OF ALLOCATION TO CITY (AF)	AVERAGE ALLOCATION TO CITY (AF)
Wet	Highest 20%	16	60,000	60,000
Normal-Wet	50% to 80%	25	60,000	60,000
Normal-Dry	20% to 50%	25	47,500 to 60,000	57,060
Dry	5% to 20%	12	28,100 to 46,800	36,575
Critical[2]	Lowest 5%	4	13,900 to 24,700	19,025
	TOTAL	**82**	**AVERAGE**	**53,680**
			MEDIAN	**60,000**

Source: 2006 Settlement Agreement

Notes:

1. As defined in 2006 Settlement Agreement
2. Includes both critical-high and critical-low, which are differentiated by the amount of unimpaired runoff. The simulation uses deliveries through 2006 and does not include the zero allocation years in 2014 and 2015.

Figure 6-8. USBR Deliveries to City Since 2007



In addition to the Class 1 water available to the City, the USBR contract also makes available water classified as: recovered water account water; Section 215 water; and unreleased restoration flows, unreleased recirculation flows, and uncontrolled season flows. The complexities of each water type are beyond the scope of this report but are mentioned here to reflect the other water acquisition opportunities afforded to the City through this contract.

The San Joaquin River water supply has excellent water quality as it originates from snowmelt from the high Sierras and has not been detrimentally impacted.

6.2.2 Fresno Irrigation District Supply

FID is one of 28 agencies that receives an entitlement of water from the Kings River through the Kings River Water Association. Water entitlements for Kings River Water Association contract members is determined based on a methodology that was initially developed in 1917–1919 to established entitlements for early claimed rights holders. The methodology was based on historic mean daily natural flow conditions at Piedra, which is approximately three miles downstream from the then yet to be built Pine Flat Dam and "at the heart of Kings River uses, regulation, and stream control and storage." (Kings River Water Association and Kings River Conservation District, June 2003)

On December 20, 2016, the Revised, Amended, and Restated Cooperative Agreement was executed between FID and the City for Water Utilization and Conveyance (2016 FID Agreement) (**Appendix I**). The 2016 FID Agreement replaces the 1976 Cooperative Agreement and ends in 2035. The Agreement identifies the City's contracted percentage of FID's Kings River water based on the City's water service area located within FID service area as a percentage of the FID land area. FID land area varies slightly every year because it is dependent on the acreage receiving water deliveries for that year rather than the total acreage within FID (roughly 200,000 acres). As the City incorporates new land area into its service area, the percentage of FID supply increases. However, the 2016 FID Agreement sets the maximum percentage as 29.0%, although the City's service area is anticipated to expand and encompass more than 29.0% of FID's service area between 2025 and 2030. In 2020, the City's percentage of overall FID Kings deliveries was 25.79%. The FID Agreement identifies that the 29.0% maximum was based on moderate growth in Growth Area 1 of the City's SOI (shown in Exhibit C in the 2016 Agreement). As such, the supply projections in this plan limit the City's FID supply with the 29.0% cap, but if the agreement were revised in the future the City's FID allocation percentage could grow beyond 29.0% as the water service area expands.

The City has historically not used all of its available allocation in any given year, although it pays a flat rate for its total allocation regardless of use. Water unused by the City is reallocated by FID to its other customers.

The City's potential supply from FID was summarized using actual Kings River deliveries for CYs 1964–2019, then categorized by the same WY types used for the USBR Friant supply. The range and average FID deliveries by WY type is shown in **Table 6-3**. The average of all 56 CY delivery totals of FID Kings River deliveries is 452,541 AF, which equates to an average potential City supply of 131,237 AF, assuming the maximum 29.0% City supply percentage. **Table 6-4** lists the historic and projected allocation of FID's Kings River water for the City in normal (average) CYs. The City percentage of FID supplies was estimated assuming the City's water service area will grow from 59,100 acres to 84,300 acres by buildout at the rate shown in **Figure 4-3**.

Table 6-3. FID Diversions by Water Year Type (1964 to 2019)

WATER YEAR TYPE	% OF YEARS[1]	NUMBER OF YEARS BETWEEN 1964 AND 2019	TOTAL FID DELIVERIES (AF)[2]		EXAMPLE AVERAGE AVAILABLE TO CITY[3]
			RANGE	AVERAGE	
Wet	Highest 20%	11	563,500 to 644,600	590,700	171,300
Normal-Wet	50% to 80%	17	452,800 to 563,300	513,700	149,000
Normal-Dry	20% to 50%	17	362,600 to 448,000	415,000	120,400
Dry	5% to 20%	8	253,700 to 362,000	315,700	91,600
Critical	Lowest 5%	3	158,100 to 253,300	210,200	61,000
		56	**AVERAGE**	**453,800**	**131,600**

Notes:

1. As defined in 2006 Settlement Agreement
2. Assigns water year type defined in defined in 2006 Settlement Agreement to FID deliveries from 1964 to 2019
3. Based on maximum 29.0% City supply percentage to provide an example City supply amount

Table 6-4. Projected FID Kings River Allocation for City, Normal Years

YEAR	PROJECTED TOTAL FID ALLOCATION, AFY	PROJECTED ALLOCATION TO CITY, AFY[1]
2025	27.55%	125,030
2030	29.00%	131,600
2035	29.00%	131,600
2040	29.00%	131,600
2045	29.00%	131,600

[1]Projected City Allocation (%) x 453,800 AFY (estimated normal year diversion by FID, per **Table 6-3**)

6.3 Stormwater

The Fresno-Clovis Metropolitan Area and surrounding rural vicinities are within the service area boundaries of the FMFCD, which has primary responsibility for managing the local stormwater flows. Most stormwater in the City drains to urban stormwater basins, where the water is retained to attenuate peak flow runoff and recharge stormwater, or is pumped to local irrigation canals for conveyance away from the municipal areas. FMFCD's operation of stormwater basins is predicated on maintaining storage capacity for rain events, which limits accessibility for recharge activities during the rainy season. FMFCD estimates the amount of stormwater that is recharged each wet season. However, recharge attained with the FMFCD basins largely occurs in May

through October when limited storage capacity is required. Dry-season recharge is accomplished by diverting surface waters, from the Kings River and Millerton Reservoir, using City-allocated surface water. It is difficult to estimate stormwater recharge volumes as there is no physical measurement of stormwater flows into the basins, and infiltration rates can vary with water elevation and degree of siltation in the basin. However, FMFCD estimates that stormwater recharge in urban basins during the winter months may range from 7,000 AF/yr to 22,200 AF/yr. Stormwater capture and infiltration are considered an integral component of natural groundwater recharge discussed in **Section 6.1.5.1**.

6.4 Wastewater and Recycled Water

6.4.1 Recycled Water Coordination

The City is currently expanding its recycled water supplies to increase offset use of potable water for landscape irrigation. In 2010, the City completed a Recycled Water Master Plan (adopted by the City Council in 2013) to evaluate and plan for increased recycled water use in the City. The City's last Metro Plan, adopted in 2014, also outlined projects to increase the use of recycled water to offset potable demands (Carollo, 2010). The City is currently updating the Metro Plan and will reevaluate recommendations and projects to increase recycled water use.

The City owns and operates two water reclamation facilities: 1) the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) and 2) the North Fresno Wastewater Reclamation Facility (NFWRF), both of which can produce Title 22 recycled water for use within the City's service area. They are described further in **Section 6.4.3**.

Coordination with other water agencies and potential consumers within the planning area is inherently within the purview of the City's Department of Public Utilities (DPU) as this department provides both water and wastewater services. DPU has been on the forefront of numerous water supply preservation, enhancement, and development projects and programs for decades. The concept of multiagency coordination is fully embraced by the department as is evident with the previously discussed joint agency agreements and the commitment to construct new infrastructure to further develop new resources. The endeavor to develop recycled water as a resource was a requirement of a development in north Fresno, where the developer was conditioned to have a net zero impact on water resources. The fundamental component of this development was the construction and dedication of the NFWRF to the City.

There are only a few agencies, besides the City, that have wastewater collection and treatment facilities within and immediately adjacent to the plan area. These agencies include:

	Collection	Treatment
City of Clovis	**X**	**X**
Malaga County Water District	**X**	**X**
Pinedale County Water District	**X**	**-**
Pinedale Public Utility District	**X**	**-**

As the City is the primary responsible agency for wastewater collection and treatment for its annexed areas and certain County islands, it has taken the lead role of developing and implementing recycled water facilities to serve the same area.

6.4.1.1 City of Clovis

The RWRF was developed under a Joint Powers Authority agreement executed in 1977 among the City of Fresno, the City of Clovis, and the County of Fresno. Both of the cities contribute to the cost of operations and maintenances and capital expenditures for the RWRF based on formulas in the agreement. This facility provides service for most of Clovis' sewer flows.

The City of Clovis recently constructed its own wastewater treatment facility that produces tertiary level effluent and is distributed in a dedicated purple pipe system within portions of its service area.

6.4.1.2 County of Fresno

The County of Fresno, like the City of Clovis, is a party to the RWRF Joint Powers Authority for treatment of flows from unincorporated areas encompassed by the City's service area.

6.4.1.3 Malaga County Water District

Malaga County Water District provides water and sewer service to an unincorporated county area of about 2.25 sq mi, which covers a small portion of the City's SOI. The district provides wastewater collection and treatment for residential and non-residential customers.

6.4.1.4 Pinedale County Water District

Pinedale County Water District provides water, sewer, and solid waste service to an area of about 2 sq mi, which service area covers an unincorporated County island and a portion of the City. The district provides wastewater collection to an area of 699 acres and diverts the flow to the City's collection system for treatment at the RWRF.

6.4.1.5 Pinedale Public Utility District

Pinedale Public Utility District provides wastewater, street lighting, street sweeping, and landscape maintenance. The district services an area of 362 acres in the northern portion of the City, serving both an unincorporated County island and portions of the City. The collected wastewater is diverted to the City's collection system for treatment at the RWRF.

6.4.2 Wastewater Collection, Treatment, and Disposal

The City's wastewater collection system was originally developed in 1891 with the installation of a 24-inch outfall sewer that discharged to a 40-acre sewer farm located southwest of town. The amount of land and facilities at this location continued to be expanded as the City grew over the years. Today, the City's wastewater collection system consists of about 1,630 miles of pipes ranging in size from 4 inches in diameter to 84 inches in diameter. This collection system also utilizes 15 lift stations throughout the City, ranging in pumping capacity from 0.25 mgd to 2.2 mgd.

6.4.2.1 Wastewater Treatment and Discharge Within Service Area

The City is served by two wastewater treatment plants, briefly described below.

Fresno-Clovis Regional Wastewater Reclamation Facility

The RWRF has developed from what was once a sewer farm to what is now a state-of-the-art wastewater treatment facility. In 1966, the City of Fresno was appointed the sewering agency

for the local metropolitan region and shortly after began long-range planning and construction of new facilities to handle increasing flows and regulatory requirements. The RWRF treats flows from not only the City, but also sewered County areas (some county areas remain unsewered), the City of Clovis, Pinedale County Water District, and Pinedale Public Utility District.

Flows received at this facility peaked at 81,100 AF in 2006 and have been steadily decreasing since, with the average influent flow about 63,000 AF over the last five years. The RWRF includes preliminary, primary, secondary, and tertiary treatment units with disinfection. Secondary treatment consists of three treatment trains with an annual average capacity of 87 mgd, consisting of 30 mgd for Train A and 57 mgd for Trains B and C combined. In 2017, a 5-mgd tertiary treatment system — the Tertiary Treatment and Disinfection Facility (TTDF) — was completed. The system can be expanded to 15 mgd and ultimately to 30 mgd.

The City has three primary means of effluent disposal:

1. Undisinfected secondary effluent to on-site and off-site farmland for restricted irrigation
2. Undisinfected secondary effluent to percolation ponds
3. Disinfected tertiary effluent to the recycled water distribution system

The percolated effluent has been deemed equivalent to Title 22 tertiary treated water by the State Water Resources Control Board Department of Drinking Water (DDW). The City has been extracting this water for reuse in areas within and surrounding the RWRF, as well as to FID's canals, through an exchange agreement for delivery to FID agricultural customers.

The discharged effluent is within the City boundaries and located just southwest of the metropolitan area. The treated effluent percolation ponds are within the City's SOI and hydrologic sphere that benefit the City's overall regional water budget. See **Figure 3-1** for a depiction of the facility's location relative to the metropolitan area.

North Fresno Wastewater Reclamation Facility

The NFWRF was constructed as part of a residential, commercial, and golf course master planned development located in the northern portion of the City. As a condition of the planned community, the developer was required to construct a wastewater treatment facility that would produce tertiary level effluent for use within the development to ensure the overall project had a net zero impact on water resources. This facility is presently rated at 0.71 mgd (average monthly flow) and 1.07 mgd (maximum daily flow). However, the ultraviolet (UV) light disinfection system was only validated for 300 gpm (0.43 mgd), which is the current flow limit until the DDW approves a higher flow. This facility is expandable to 1.25 mgd (average monthly flow). The disinfected tertiary effluent from the plant is largely used to irrigate the Copper River Ranch Golf Course. Of the 325 AF of wastewater treated in 2020, 54 AF was used for irrigation of turf. Treated but unused effluent is diverted to the City's collection system to the RWRF.

6.4.3 Recycled Water System Description

The 2014 Metro Plan recommended expanding reuse by: 1) using the NFWRF effluent to irrigate Copper River Ranch Golf Course; and 2) up to 25,000 AFY of recycled water for landscape irrigation or other non-potable uses from the RWRF or new satellite WRFs. Since then, the City has irrigated the Copper River Ranch Golf Course with recycled water and has constructed much of the southwest recycled water distribution system. However, the City is currently updating the Metro Plan and reevaluating the target volume of reuse in the City beyond the southwest system

considering new conditions and regulations, including the potential for potable reuse in the future.

6.4.3.1 Fresno-Clovis Regional Wastewater Reclamation Facility

As mentioned above, the RWRF produces undisinfected secondary effluent for restricted irrigation to on-site and off-site farmlands and disinfected tertiary treated effluent for the recycled water distribution system.

The City's RWRF diverts a portion of the undisinfected secondary effluent to irrigate non-food crops grown adjacent to this facility. The practice of using the secondary effluent to irrigate non-food crops has been carried-out for decades and is expected to continue for the foreseeable future. The City owns nearly 3,300 acres of land for and around the RWRF, consisting of percolation ponds (1,750 acres) and other land available to farm non-food crops. **Table 6-5** provides the annual quantities of recycled water applied to these crops for the period from 2015–2019.

Additionally, the RWRF produces Title 22 disinfected tertiary treated effluent through the TTDF completed in 2017 and through tertiary equivalent soil aquifer treated recycled water recovered from the percolated secondary effluent. A series of 15 groundwater wells located at the RWRF are used to extract previously percolated effluent groundwater from beneath the facility. The extracted groundwater has the potential to be used for higher beneficial use if it can be demonstrated this water has attained a level of treatment satisfactory to meet disinfected tertiary levels. The City embarked on a joint project with the WateReuse Research Foundation to demonstrate to State regulatory agencies the soil aquifer treated recycled water met Title 22 levels. The culmination of this study is presented in a final report entitled "Demonstration of Filtration and Disinfection Compliance Through Soil-Aquifer Treatment," which was completed in 2013 (WateReuse Research Foundation, 2013). This study concluded that, based on the documented sampled water quality data, the extracted groundwater met requirements for classification as disinfected tertiary level recycled water. The SWRCB DDW stated that the percolated effluent water meets the tertiary treatment classification, and the City is making plans for its use as part of its recycled water production and distribution system (California Regional Water Qulaity Control Board, 2018). The combined rated production yield of the 15 wells, if run year-round, would be approximately 32,000 AFY. The City plans to blend the recycled extraction well water with the disinfected tertiary level recycled water produced from the 5 mgd TTDF to feed the southwest recycled water distribution system. As new sales grow for the recycled water, additional recycled extraction well water will be utilized to feed the City's southwest recycled water system.

The tertiary equivalent soil aquifer treated recycled water (recovered groundwater) is also used for on-site irrigation and transport to FID canals for delivery to customers during the irrigation season, as facilitated through an exchange agreement with FID. More information on the City's FID RWRF Exchange Agreement is discussed in **Section 6.6**.

Since the completion of the 2010 Recycled Water Master Plan (RWMP), the City has constructed most of the southwest recycled water system, shown in **Figure 6-9.** The southwest recycled water system consists of a 3.2 MG recycled water reservoir located at the RWRF, a 6,000 gpm (8.64 mgd) recycled water pump station located at the RWRF, a 640-gpm booster pump station (Roeding Park Booster), and 15.7 miles of 10-inch to 54-inch recycled water pipeline. Roughly 7.5 miles of pipeline remain to be constructed. The City also updated the demand and distribution system from the 2010 RWMP with the 2019 Citywide Recycled Water Demand and Southwest

Recycled Water System Analysis (Carollo, 2019) to identify potential recycled water customers. This recent analysis will be incorporated into the latest Metro Plan update.

6.4.3.2 North Fresno Water Reclamation Facility

As described earlier, the City has an existing recycled water plant in the northern portion of the City that receives and treats sewage from the residential, commercial, and golf course master planned community. The NFWRF was constructed in 2008 but was not fully operational until 2009 due to the inability to properly run at extremely low flow conditions. Subsequent modifications at the plant allowed it to run on a regular basis in 2010 and again in 2014 for UV approval. The amount of reuse has varied substantially since 2016 because the delivery system was offline in 2017 and 2018 for treated water basin slope repairs. City staff indicated that 2016 is representative of operations going forward. The disinfected tertiary effluent is conveyed in a dedicated pipeline to an adjacent golf course for irrigation purposes. The quantities used for irrigation purposes are shown in **Table 6-5** for the period of 2015–2019.

Table 6-5. Historic Recycled Water Used Within Service Area

	QUANTITY (AFY)					
RECYCLE WATER FACILITY	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
RWRF, Secondary Effluent (Non-Food Crop Irrigation)	8,688	7,329	4,540	7,031	3,652	3,845
RWRF, Tertiary Effluent	531	485	423	867	912	858
NFWRF	62	110	0	0	19	54
TOTAL	**9,281**	**7,924**	**4,963**	**7,898**	**4,583**	**4,757**

Note: Reuse at the NFWRF was zero in 2017 and 2018 because the recycled water delivery system was offline for system repairs.

6.4.4 Potential, Current, and Projected Recycled Water Uses

The 2020 actual recycled water use, and projected recycled water use in the City's service area is included in **Table 6-6**. Secondary undisinfected reuse is projected to continue to be used to irrigate non-food crops adjacent to the RWRF in the future. The projected secondary undisinfected use going forward is based on the average use from 2015 to 2020. Additionally, the amount of tertiary recycled water from the RWRF is projected to increase to provide 6,210 AF for landscape and agricultural irrigation as the southwest recycled water system is built out. Projected tertiary recycled water from the NFWRF for golf course irrigation is projected to be 110 AF annually through 2045.

The 2015 UWMP anticipated that 21,200 AFY of recycled water would be produced and utilized in 2020. The previous projected increases in recycled water were based on recommendations from the 2010 RWMP, which included projects to increase recycled water use for landscape irrigation, agricultural irrigation, industrial use, and blending with raw surface water for groundwater recharge. Since the 2010 RWMP, the City has focused on constructing the southwest recycled water system to increase landscape and agricultural irrigation in the southwest portion of the City. The City is also currently updating the Metro Plan that is evaluating recycled water alternatives in the City and is expected to update its RWMP following the Metro Plan update to serve as a new guiding planning document for recycled water use by the City.

Customer ID	Customer Name	MDD (gpm)	PHD (gpm)	Hours of Irrigation
1	Quist Farms	1,300.0	1,300.0	24
2	Fresno Memorial Gardens	131.0	450.0	7
3	Roeding Park	267.0	640.0	10
4	Peelman Farms	650.0	650.0	24
5	Peelman Farms	650.0	650.0	24
6	St Peters Cemetery	152.7	458.2	8
7	Westside Auto	8.0	30.0	6
8-10	Multiple Cemeteries	225.8	677.2	8
11-12	Caltrans-99	100.0	300.0	8
13-16	Multiple Cemeteries	225.8	677.2	8
17	Masis Ararat Cemetery	80.0	240.0	8
18	Belmont Memorial Park	172.3	517.0	8
19	Caltrans 180/ Hughs	33.3	100.0	8
20	Caltrans 180/ Fruit	16.7	50.0	8
21	Fink-White Park	61.0	183.0	8
22	Caltrans 99/ Amador	16.7	50.0	8
23	Columbia Elem	44.3	133.0	8
24	Frank Ball Park	19.3	58.0	8
25	Kearney Triangle	18.3	55.0	8
26	Eaton Plaza	21.0	63.0	8
27	Veteran's Memorial	27.7	83.0	8
28	City Hall	27.7	83.0	8
29	AmeriPride	67.3	202.0	8
30	Courthouse Park	116.7	350.0	8
31	Community Regional	173.0	519.0	8
32	Chukchansi Park	59.3	178.0	8
33	Caltrans 41/H	16.7	50.0	8
34	McKinley Elem	66.7	200.0	8
35	El Capitan Middle	83.3	250.0	8
36	Polk Elem	74.7	224.0	8
37	Madison Elem	56.1	168.3	8
38	King Elem	44.3	101.6	8
39	Gaston Middle	87.5	350.0	8
40	Computech Middle	63.0	245.5	8
41	Edison High	43.7	166.0	8
42	Fresno City College	639.4	871.9	24
43	Hinton Park	19.3	58.0	8
44	Oasis Residential Development	210.5	631.5	8
	Total	**6,070.0**	**12,013.4**	**---**

Shields Ave
McKinley Ave
Belmont Ave
Whitesbridge Ave/ CA-180
California Ave
Jensen Ave
SWPS1
Roeding Park PS
RWRF PS
3.2 MG Recycled Water Reservoir
Fresno-Clovis Regional WRF
Brawley Ave
Marks Ave
West Ave
Walnut Ave
Elm Ave

Legend

Existing Facilities
- Wastewater Reclamation Facility
- Existing Recycled Water Pipeline
- Recycled Water Reservoir

Recycled Water Pump Station
- Existing
- Future

Future/ Proposed Recycled Water Pipelines
- Oasis Development
- SW1D
- South Pipeline

Recycled Water Customer
- Existing Recycled Water Customer
- Agriculture
- Cemetery
- Central Unified School District
- College
- Fresno Unified School District
- Park
- Private/Commercial
- Residential
- Freeway

City Features
- Fresno Sphere of Influence
- Fresno City Limits
- Streets

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Prepared by: WSC

N

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References:
1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
2. Figure recreated from Figure 7 Potential Southwest Recycled Water Users from the 2019 City Wide Recycled Water Demand and Southwest Recycled Water System Analysis prepared by Carollo Engineers, Inc.

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-9. Southwest Recycled Water System

Table 6-6. Recycled Water within Service Area in 2020 (DWR 6-4R)

The supplier will complete the table.

Name of Supplier Producing (Treating) the Recycled Water:	City of Fresno
Name of Supplier Operating the Recycled Water Distribution System:	City of Fresno
Supplemental Volume of Water Added in 2020:	0%
Source of 2020 Supplemental Water:	N/A

BENEFICIAL USE TYPE	POTENTIAL BENEFICIAL USES OF RECYCLED WATER	AMOUNT OF POTENTIAL USES OF RECYCLED WATER	GENERAL DESCRIPTION OF 2020 USES	LEVEL OF TREATMENT	2020	2025	2030	2035	2040	2045
Agricultural Irrigation[1]	Non-foodcrop irrigation	7,900	Irrigate non-food crops	Secondary, Undisinfected	3,845	7,900	7,900	7,900	7,900	7,900
Landscape Irrigation (excludes golf courses)	Landscape Irrigation	5,800	Landscape irrigation, distributed through the southwest recycled water distribution system	Tertiary	858	5,800	5,800	5,800	5,800	5,800
Agricultural Irrigation[1]	Food crop irrigation	410	Irrigate limited food crops, distributed through the southwest recycled water distribution system	Tertiary	-	410	410	410	410	410
Golf Course Irrigation	Landscape Irrigation	110	Copper River Golf Course	Tertiary	54	110	110	110	110	110
-				Total:	4,757	14,220	14,220	14,220	14,220	14,220

Note:

1. Recycled water for agricultural irrigation does not offset the City's potable water demands, and as such, is excluded from projected recycled water in subsequent tables.

6.4.5 Actions to Encourage and Optimize Future Recycled Water Use

The 2010 RWMP identified the need for the City to adopt an ordinance to establish a recycled water policy and criteria for its use within the City's SOI. On July 14, 2014, the Recycled Water Ordinance was adopted by the City Council, laying the foundation for the expanded use of recycled water within the City.

The focus of the ordinance includes the following:

- Establish an Administrative Authority.
- Establish approved uses of recycled water.
- Define areas of potential eligibility for recycled water service.
- Specify voluntary uses of recycled water, depending on user classifications.
- Require installation of a transmission and distribution infrastructure.
- Encourage the use of voluntary retrofits for existing users that may not be addressed in the ordinance.
- Require the City of Fresno to prepare Rules and Regulations.
- Provide enforcement and severability clauses.
- Establishing a means for the City to provide recycled water at a negotiated price.

Efforts to further the use of recycled water include the requirement that new developments within planned major recycled water distribution mains must install purple pipe. Then, as the City's capital projects construct a distribution infrastructure, these segments will be in place to facilitate connections to new customers, reduce program costs by avoiding digging up new street improvements and reduce disruption to vehicular traffic.

Most of the southwest recycled water distribution system from the RWRF is completed or planned for construction in 2021. The City has identified potential customers to connect to the recycled water system once it is completed to offset potable demand and increase recycled water use in the City.

6.5 Desalinated Water Opportunities

The City is located in the central San Joaquin Valley; therefore, seawater desalination is not applicable to the City. Additionally, the groundwater that exists within the immediate area of the City is not brackish in nature and does not require desalination treatment.

6.6 Water Exchanges and Transfers

6.6.1 Exchanges and Transfer Opportunities

6.6.1.1 USBR Supply

The Central Valley Project Improvement Act (CVPIA) of 1992 authorized the transfer of all or a portion of a CVP contractor's water supply to any other California water users or water agencies. The CVPIA allows water transfers as long as they are consistent with federal and state water laws. The primary component of the CVPIA that specifies water transfer provisions for federal

water supplies is Section 3405(a), which includes provisions regarding maximum annual water transfer, beneficial use, and approvals.

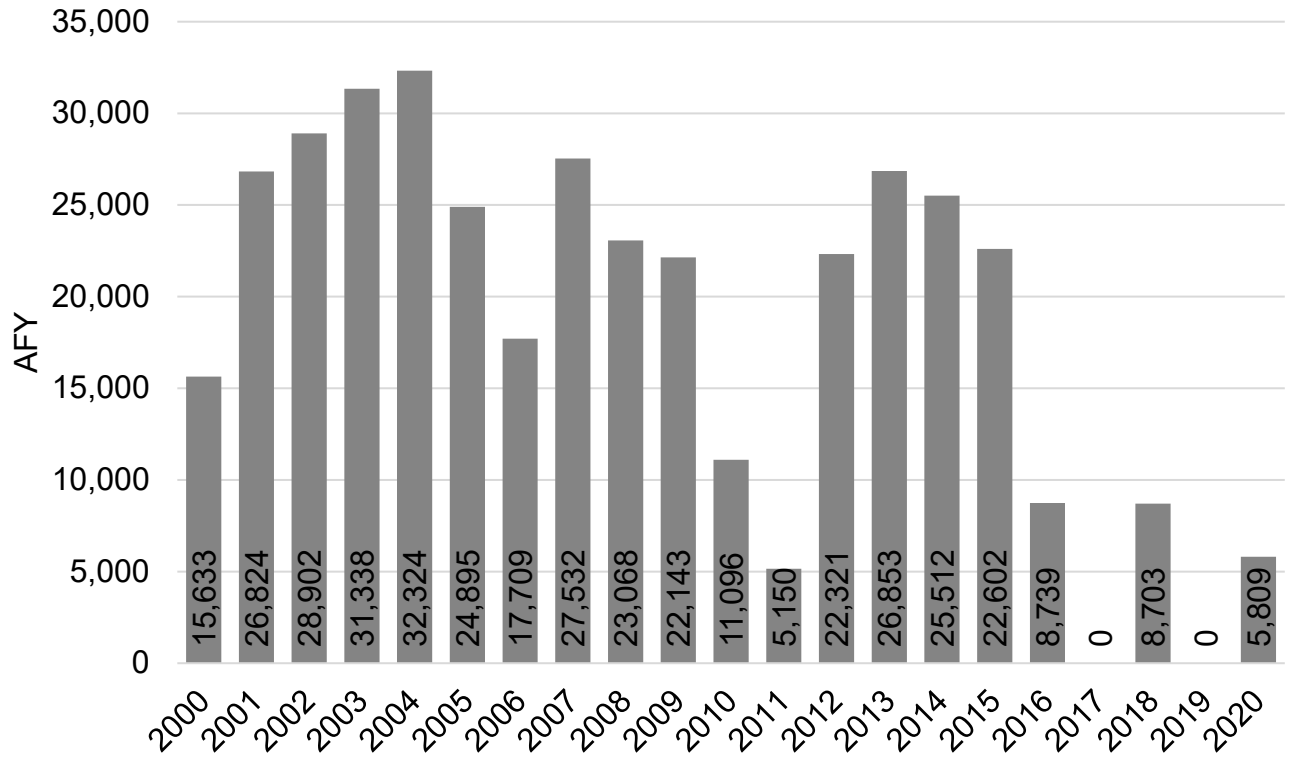
As part of the City's current Metro Plan update, the City is evaluating potential future water transfers and exchanges of its periodically available USBR water. Currently, the City does not have any plans to transfer its USBR water to other California water users.

6.6.1.2 FID / RWRF Groundwater Exchange Supply

Since 1974, the City has had an agreement with FID to exchange recycled water for the delivery of surface water east of the City (**Appendix I**). The Agreement between FID and the City for Exchange of Recycled Water allows for water pumped from beneath the RWRF to be conveyed to FID's Dry Creek and Houghton Canals for delivery to growers west of the City. In exchange for the water delivered to FID by the City, FID agreed to deliver 46% of the total from either its Kings River entitlement or USBR Class II supply to growers or basins in the eastern portion of FID "insofar as is feasible and practical." The water is to be considered additional to the water that would have been delivered to the eastern portion of FID, such that the additional delivered water used by growers is assumed to offset groundwater pumping in the area and, therefore, provide a groundwater basin benefit. This is an indirect benefit to the City.

The agreement includes a minimum of 100,000 AF delivered over a 10-year period and no more than 30,000 AF in any given year. As shown in **Figure 6-10**, the City exceeded the maximum yearly delivery in 2003 and 2004 and has maintained more than 100,000 AF of deliveries over a 10-year period. However, since 2016, the City has reduced RWRF groundwater exchange deliveries. The City is currently discussing an update to the agreement with FID, while the 2020 Metro Plan will identify and recommend other beneficial uses for the City's percolated effluent.

Figure 6-10. Historical RWRF Groundwater Exchange Deliveries



6.6.2 Emergency Interties

In 2007, the Cities of Fresno and Clovis executed an agreement for interconnection of their potable water systems to provide service during emergencies and other times of hardship in either community. The agreement covers interconnections, including apportionment of capital costs, at two locations: Leonard Avenue at the Gould Canal alignment and Behymer Avenue at Willow Avenue.

The agreement provided for temporary deliveries from Clovis to southeast Fresno through the Leonard connection through 2013. The Leonard interconnection was constructed and remains in place for emergency uses through manual operation.

The agreement also provided for temporary deliveries from Fresno to northern Clovis through the Behymer connection through 2015. However, the Behymer interconnection has yet to be constructed and, if constructed in the future, would serve only for emergency use.

6.7 Future Water Projects

The City is currently updating its Metro Plan, which will recommend programs and projects to improve the City's water supply portfolio and continue providing a safe, reliable, and sustainable water supply. While the outcomes of the Metro Plan update are currently being developed, the City's ongoing and future projects to improve its supply portfolio include:

- Expansion of recycled water distribution system
- Expansion of groundwater recharge program
- Expansion of surface water treatment capacity
- Beneficial transfers and exchanges

6.7.1 Expand Recycled Water Distribution System

As mentioned in **Section 6.4.5**, the City has made significant improvements to their recycled water system over the last five years and is currently expanding their recycled water distribution system. The City expects to implement construction on the final portion of the Southwest recycled water distribution system this year. The completed distribution system will allow an additional 5,000 AF of recycled water use in the City to offset potable demands that can be used in all hydrological year types. The expansion is projected to be completed by 2025.

6.7.2 Expand Groundwater Recharge Capacity

With the acknowledgement that the groundwater aquifer is and will remain an integral resource, the City is currently evaluating an expanded recharge program as part of the Metro Plan update. Expanding intentional recharge may include the development of new dedicated intentional recharge facilities and/or joint projects for basins with FMFCD and potentially FID. The target for recharge expansion is to maximize storage within the groundwater basin and optimize use of available surface water supplies in normal years. The stored water will be used more in the single-dry year and consecutive dry years when surface water supplies are less available.

The timing for groundwater recharge capacity expansion will be examined as part of the Metro Plan update and, for the UWMP, is assumed to increase to allow for an additional 540 AFY of recharge to occur on average each year.

6.7.3 Expand Surface Water Treatment Capacity

A key component to the success of the City's ability to reverse the long-time overreliance on groundwater is the construction of its surface water treatment facilities. These have allowed the City to optimize the use of available surface water supplies. The City's NESWTF currently has a 30 mgd capacity and the capability to expand up to 60 mgd. The SESWTF is currently permitted to produce up to 54 mgd but, with the subsequent rerating of the media filters, will be capable of operating at a rated capacity of 80 mgd.

The timing for the SWTF expansion will be examined as part of the Metro Plan update and determined based on need as the City grows and demands increase.

6.7.4 Beneficial Transfers and Exchanges

As mentioned in **Section 6.6.1**, the City is evaluating future beneficial transfers and exchanges of the City's USBR water in normal water years when available water supplies exceeds demands.

6.8 Summary of Existing and Planned Sources of Water

Summaries of the above discussed existing and planned sources of water are provided in **Table 6-7** and **Table 6-8** below.

6.8.1 Supply Management

The City currently balances its surface water supplies and groundwater based on minimum production for operation of the SWTFs and minimum groundwater pumping to manage and control contamination plumes and prevent their spread. The minimum operation conditions typically occur in the low-demand winter months, and the City can increase surface water production during peak demand months when surface water is available. In normal and wet years, the City intends to rely on more surface water supply and recharge raw surface water to replenish the groundwater basin and build storage for dry years. In dry years, when surface water is less available, the City will ramp up well production to meet demands. The City is expected to continue this supply management strategy in the future.

Table 6-7. Actual Water Supplies (DWR 6-8R)

	2020	
WATER SUPPLY	**ACTUAL VOLUME**	**WATER QUALITY**
Groundwater	55,028	Drinking Water
USBR CVP	37,447	Drinking Water
FID Kings River	71,292	Drinking Water
Recycled Water, RWRF	858	Recycled Water
Recycled Water, NFWRF	54	Recycled Water
TOTAL:	**164,679**	

Table 6-8. Projected Water Supplies (DWR 6-9R)

	REASONABLY AVAILABLE VOLUME, AFY				
WATER SUPPLY	**2025**	**2030**	**2035**	**2040**	**2045**
Groundwater	138,090	143,630	149,100	154,490	159,820
USBR CVP	60,000	60,000	60,000	60,000	60,000
FID Kings River	125,030	131,600	131,600	131,600	131,600
Recycled Water, RWRF	5,800	5,800	5,800	5,800	5,800
Recycled Water, NFWRF	110	110	110	110	110
TOTAL:	**329,030**	**341,140**	**346,610**	**352,000**	**357,330**

6.8.2 Special Conditions

This section details climate change and future regulatory conditions that impact the City's supply sources.

6.8.2.1 Climate Change Effects

Climate models disagree on average annual precipitation projections but agree on other hydrologic metrics relevant to water resources management, including:

- Snowpack declines
- Increased fraction of precipitation on extreme rainfall days
- Shorter, sharper rainy season
- Increased evapotranspiration
- Higher frequency of extremely wet and extremely dry years
- Higher incidence of extreme dry year followed by an extreme wet year or vice versa (Persad, 2020) (Partida, 2020)

As discussed in **Section 4.4**, climate change impacts were evaluated in the North Kings GSP using DWR climate change datasets, which were developed for the California Water Commission's Water Storage Investment Program (WSIP). The North Kings GSP analyzed WSIP water supply projections and found climate change will have no significant impact on the FID Kings River diversions. The North Kings GSP estimates the timing of the inflows to water reservoir and surface water supplies is anticipated to shift significantly due to warmer temperatures causing precipitation to arrive as rainfall instead of snowmelt. The warmer temperatures are also predicted to cause the snowmelt to turn to runoff earlier each spring. These climate impacts are estimated in the North Kings GSP to slightly increase inflows to the Kings River (0.6% in 2040 and 0.3% in 2070); however, it is not expected to impact the Kings River diversions significantly and the timing will have a greater impact on water management, including a possible greater need for additional storage. The North Kings GSP also estimated climate impacts to the San Joaquin River supplies available to the CVP Friant Division Contractors, including the City's USBR Class I supplies, and found the WSIP dataset estimates a slight reduction in future water supplies (Provost & Pritchard, November 2019). This plan

considers water supply during an extreme dry year or multi-dry year scenario, which may occur more often due to climate change, further in **Chapter 7**.

6.8.2.2 Regulatory Conditions

The City has existing contracts for its surface water supplies that are not facing any reduction due to forthcoming regulation. The City's groundwater supply is from an unadjudicated basin and is also considered reliable. The GSA is currently working toward determining a safe yield for the Kings Subbasin, which is the amount of water than can be pumped from the basin over a long-term period without producing undesirable results. The City is an active member of the GSA, working collaboratively to bring the basin to balance while protecting the City's groundwater supply.

Additionally, forthcoming California regulations for per- and polyfluoroalkyl substances (PFAS) may impact certain wells within the City. The City is currently monitoring and treating some groundwater wells for PFAS. These regulations are not expected to impact the City's ability to use its full groundwater supply.

6.9 Energy Intensity

Pursuant to CWC Section 10631.2(a), readily available information regarding energy intensity shall be reported in the 2020 UWMP. For the City, this includes the total energy usage at each production facility, including each well site and the three SWTFs. The electrical usage includes the energy to produce, treat, and pump the water into the distribution system. Because the City's distribution system includes over 200 groundwater wells, **Table 6-9** presents the total energy usage, water produced, and average energy intensity for all groundwater wells and for each SWTF following the methodology presented in Appendix O of the DWR 2020 UWMP Guidebook. The energy intensity varies significantly between groundwater wells depending on the depth to the groundwater table, if the well includes treatment beyond disinfection, and other local conditions. The total energy intensity for all production and treatment in the City's distribution system in 2020 was 384 kWh/ AF.

Table 6-9. Water System Energy Intensity in 2020

	WELLS	NESWTF	SESWTF	T-3 SWTF	TOTAL
Electricity (kWh)	27,667,366	5,848,314	13,416,000	454,470	47,386,150
Treated Water Deliveries (AF)	56,445	20,724	45,367	875	123,411
Energy Intensity (kWh/AF)	490	282	296	520	384

CITY OF FRESNO

7 Water Service Reliability and Drought Risk Assessment

This Section discusses the long-term reliability of surface and groundwater supplies for the City.

A comparison is made of anticipated supplies and demands through 2045 for a normal year, single dry year, and five-year drought. Shorter-term reliability planning that may require immediate action, such as drought or catastrophic supply interruption, is addressed in **Chapter 8**.

IN THIS SECTION

- Water Service Reliability Assessment
- Drought Risk Assessment

7.1 Water Service Reliability Assessment

This section describes the existing constraints on the City's supply sources and reliability in different hydrologic year types.

7.1.1 Constraints on Water Sources

7.1.1.1 Groundwater

Groundwater has long been the primary water supply source for the City. Before the City's investments to increase its use of surface water with the construction of its NESWTF, T-3 SWTF, and SESWTF, groundwater levels were declining, and the falling levels were a potential constraint. Groundwater levels in some areas of the City have actually been increasing over the last five years as a result of the City's using less groundwater and are expected to continue to increase as the City pumps less in the future.

The North Kings GSP is setting sustainability indicators for groundwater levels and groundwater storage. The current GSP does define a measurable objective and minimum threshold for the basin to allow the North Kings GSA to evaluate its progress for the subject indicator, as defined by SGMA, and determine whether conditions are improving, remaining stable, or degrading.

Another constraint to the use of groundwater stems from the negative impacts from contamination (see **Section 6.1.4**). To ensure the continued beneficial use of the groundwater supply, the City has set minimum pumping requirements for specific wells to prevent the spread of existing groundwater plumes to other areas in the City and to protect the basin. The City will remain proactive in pursuing responsible parties so the proper remediation is conducted to preserve the groundwater system as a viable and sustainable resource in perpetuity. Largely, the City has been able to rely on the relatively good quality of this resource.

7.1.1.2 USBR

The City has a contract for 60,000 AFY of Class 1 water with the USBR. Analysis supporting the 2006 San Joaquin River Settlement is the basis for USBR supply projections. The settlement is based on ensuring flows downstream of Millerton Dam for varying hydrologic conditions, which can constrain surface water supplies available to the CVP Friant Division contractors, such as the City.

Another constraint that affects the consistency of this supply are the restrictions that have been imposed on water diversions from the Delta (see **Section 6.2.1**). The resulting impacts associated with the restrictions from the Delta has been more detrimental to water supplies for the CVP Friant Division contractors than the above-discussed settlement, as the latter has resulted in two years of zero allocations for the CVP Friant Division contractors.

The construction of a raw water pipeline in 2018 to convey USBR water from the Friant-Kern Canal to the NESWTF, referred to as the Friant-Kern Canal Pipeline, has improved the reliability and water quality of deliveries to the NESWTF. The NESWTF is now capable of year-round operation, and the original connection from FID's Enterprise Canal still exists as a backup delivery system if needed.

Every three years, the Friant-Kern Canal is taken down for maintenance, and during these shutdowns the City has the flexibility to deliver its Kings River supply to the NESWTF to allow for its continued use.

7.1.1.3 FID

The City has an agreement with FID providing the City an allocation of approximately 115,000 AFY of Kings River water in normal-year conditions. Water supplied from the FID contract is most susceptible to annual hydrologic conditions. The City's annual FID supply allocation is dependent on annual precipitation, Sierra Nevada mountain snowpack, and natural river flow conditions. The annual variability of these sources results in variable allocations to the City. Based on the foregoing data, FID receives an annually adjusted entitlement, the delivery of which will fluctuate throughout the irrigation delivery season. The City in turn receives its pro rata allocation based on the foregoing entitlement determination.

Another factor that may constrain the availability of Kings River water supply is scheduled maintenance of FID's vast canal network. FID typically terminates water deliveries to the City's water treatment facilities in the months of November and/or December so they can perform necessary infrastructure repairs and maintenance. However, the City constructed a dedicated 13-mile, 72-inch-diameter raw water pipeline to deliver Kings River water to the SESWTF to allow for year-round operations and prevent shutdowns due to FID maintenance. Deliveries to intentional recharge facilities will continue to be supplied through the FID canal system.

7.1.1.4 Recycled Water

At present, the largest constraint for recycled water use is the lack of infrastructure to distribute the water to end users. The City has recently increased recycled water production capabilities and constructed much of the southwest recycled water system, as described in **Section 6.4**. The City plans to complete construction of the southwest recycled water distribution system in the near term and expand its recycled water delivery in the City.

7.1.2 Description of Management Tools and Options

The City currently manages its surface water and groundwater supply by maximizing surface water for potable use and intentional recharge during wet and normal years, while relying on groundwater during dry years. The City is currently updating its Metro Plan, which will recommend projects and programs to optimize the use of its supply portfolio and further improve supply resilience. Supply management tools are an expected outcome of the Metro Plan update; however, the City's ongoing supply management is intended to maximize local supplies and improve the groundwater basin storage. Current actions include enhanced groundwater management and intentional recharge, increased recycled water use, and continued conservation through the implementation of demand management measures.

7.1.3 Year Type Characterization

Normal-water-year, single-dry-water-year, and five-consecutive-year-drought-period supply projections were made based on historic water allocations for surface water supplies, historic municipal water well pumping for groundwater, and projected utilization for recycled water, as described below.

Kings River water supply data was obtained from the Kings River Water Association and FID. USBR CVP Friant Division data was obtained from the USBR website, the City of Fresno, and FID. Groundwater and recycled water supply data was obtained from the City of Fresno.

7.1.3.1 Normal Year

Data for the total water supply for the normal-year condition is provided in **Table 7-1** based on:

- **Groundwater:** estimated sustainable yield from **Table 6-1**.
- **USBR:** long-term average allocation from **Table 6-2**.
- **FID:** long-term average allocation from **Table 6-3**.
- **Recycled Water:** projected supply from **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand.

7.1.3.2 Single Dry Year

The single-dry-year supply availability is based on 2015, during the 2012-2017 drought, because the City had the lowest surface water supply available in 2015. Data for total water supply for the single-dry-year condition is provided in **Table 7-2** based on:

- **Groundwater:** estimated sustainable yield from **Table 6-1**. If necessary, the City would pump beyond its estimated sustainable yield during dry periods and balance out the pumping with recharge in normal or wet periods.
- **USBR:** actual allocation in 2015 (0 AF).
- **FID:** actual total FID allocation in 2015 (42,935 AF) but with the projected City percentage of FID supply for the future years considered (per **Table 6-3**).
- **Recycled Water:** projected supply from **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand.

7.1.3.3 Multiple Dry Years

Data for total water supply for the five-year drought condition is provided in

Table 7-3 based on:

- **Groundwater:** estimated sustainable yield from **Table 6-1**. If necessary, the City would pump beyond its estimated sustainable yield during dry periods and balance out the pumping with recharge in normal or wet periods.
- **USBR:** actual allocations in 2012 to 2016, which ranged from 0 to 45,000 AF.
- **FID:** actual total FID allocations in 2012 to 2016, which ranged from 42,935 to 110,824 but with the projected City percentage of FID supply for the future years considered (per **Table 6-3**).
- **Recycled Water:** projected supply from **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand**.**

Despite severe reductions of surface water supplies during dry years, sufficient good-quality water was available to permit the SWTFs to operate. As mentioned in the previous section, there is some seasonal vulnerability with surface water availability in dry years, which needs to be closely coordinated with surface water suppliers to minimize impacts to the City's SWTF operations. Groundwater supplies, with intentional recharge augmentation, remain reliable in all hydrologic conditions.

7.1.4 Water Service Reliability

This section compares projected supplies and demands for a normal year, single dry year, and five-year consecutive drought. As shown in **Table 7-1**, the City is projected to have greater than 100,000 AF of available supply after meeting demands in normal years. As shown in **Table 7-2**, the City's surface water supplies are reduced in a single dry year, but all potable demands are met and groundwater recharge of raw surface water is reduced. As shown in **Table 7-3**, the City is projected to meet all demands during a five-year drought with its existing supplies. Potable demands are unrestricted, and non-potable water used for groundwater recharge is reduced in years three and four of a five-year drought.

Table 7-1. Normal Year Supply and Demand Comparison (DWR 7-2R)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	60,000	60,000	60,000	60,000	60,000
Surface Water – FID	125,030	131,600	131,600	131,600	131,600
Recycled Water	5,910	5,910	5,910	5,910	5,910
SUPPLY TOTALS	**329,030**	**341,140**	**346,610**	**352,000**	**357,330**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable (Groundwater Recharge) Demand	62,700	65,400	68,100	70,800	73,500
DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
DIFFERENCE:	**129,826**	**128,384**	**124,300**	**120,124**	**115,883**

Table 7-2. Single Dry Year Supply and Demand Comparison (DWR 7-3R)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	0	0	0	0	0
Surface Water – FID	45,852	45,852	45,852	45,852	45,852
Recycled Water	5,910	5,910	5,910	5,910	5,910
SUPPLY TOTALS	**189,852**	**195,392**	**200,862**	**206,252**	**211,582**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable (Groundwater Recharge) Demand	27,588	28,776	29,964	31,152	32,340
DEMAND TOTALS	**164,092**	**176,132**	**184,174**	**192,228**	**200,287**
DIFFERENCE:	**25,760**	**19,260**	**16,688**	**14,024**	**11,295**

Table 7-3. Multiple Dry Years Supply and Demand Comparison (DWR 7-4R)

		2025	2030	2035	2040	2045
FIRST YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	30,000	30,000	30,000	30,000	30,000
	Surface Water – FID	99,725	99,725	99,725	99,725	99,725
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**273,725**	**279,265**	**284,735**	**290,125**	**295,455**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
	DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	DIFFERENCE:	**74,521**	**66,509**	**62,425**	**58,249**	**54,008**
SECOND YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	37,200	37,200	37,200	37,200	37,200
	Surface Water – FID	93,426	93,426	93,426	93,426	93,426
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**274,626**	**280,166**	**285,636**	**291,026**	**296,356**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
	DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	DIFFERENCE:	**75,422**	**67,410**	**63,326**	**59,150**	**54,909**
THIRD YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	0	0	0	0	0
	Surface Water – FID	73,568	73,568	73,568	73,568	73,568
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**217,568**	**223,108**	**228,578**	**233,968**	**239,298**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	53,763	46,281	43,526	40,677	37,761
	DEMAND TOTALS	**190,267**	**193,637**	**197,736**	**201,753**	**205,708**
	DIFFERENCE:	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**

		2025	2030	2035	2040	2045
FOURTH YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	0	0	0	0	0
	Surface Water – FID	45,852	45,852	45,852	45,852	45,852
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**189,852**	**195,392**	**200,862**	**206,252**	**211,582**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	26,047	18,564	15,810	12,960	10,045
	DEMAND TOTALS	**162,551**	**165,920**	**170,020**	**174,036**	**177,992**
	DIFFERENCE:	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
FIFTH YEAR	Groundwater	138,090	143,630	149,100	154,490	159,820
	Surface Water – USBR	45,000	45,000	45,000	45,000	45,000
	Surface Water – FID	125,840	125,840	125,840	125,840	125,840
	Recycled Water	5,910	5,910	5,910	5,910	5,910
	SUPPLY TOTALS	**314,840**	**320,380**	**325,850**	**331,240**	**336,570**
	Potable Demand	136,504	147,356	154,210	161,076	167,947
	Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
	DEMAND TOTALS	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
	DIFFERENCE:	**115,636**	**107,624**	**103,540**	**99,364**	**95,123**

7.2 Drought Risk Assessment

A new provision of the Water Code directs Suppliers to prepare a DRA. The DRA considers a drought period lasting five consecutive years, starting from the year following the year when the assessment is conducted. For this plan, the DRA considers five consecutive dry years from 2021 through 2025. The City may conduct an interim update or updates to this DRA within the five-year cycle of its UWMP update. The DRA analysis allows the City to examine the management of its supplies during stressed hydrologic conditions and an opportunity to evaluate whether the City may need to enact its Water Shortage Contingency Plan (WSCP) during the next actual drought period lasting at least five years. The projected gross water use for the five-year DRA is based on unrestricted potable demand, a reduction in raw-water demand for intentional recharge in years three and four of the five-year drought, and unrestricted recycled water demand.

The reliability of supplies over a five-consecutive-year drought is described in **Section 7.1.4** and summarized below for 2021 through 2025:

- **Groundwater:** based on interpolating between the 2020 and 2025 values in **Table 6-1**. If necessary, the City would pump beyond its estimated sustainable yield during dry periods and balance out the pumping with recharge in normal or wet periods.
- **USBR:** based on the actual supply allocations from these sources during the driest consecutive five-year drought (2012–2016).

- **FID:** based on the actual supply allocations from these sources during the driest consecutive five-year drought (2012–2016). For this DRA, the City's percentage of FID supplies are conservatively assumed to remain at the existing 25.79%.
- **Recycled Water:** based on interpolating between the 2020 and 2025 values in **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand.

Table 7-4 compares the total projected supply and demand for the five-year DRA for 2021 through 2025. As shown, the City does not expect to enact its WSCP for a five-consecutive-year drought based on the unrestricted potable demand projections and the current supply portfolio and reliability.

Table 7-4. Five-Year Drought Risk Assessment

WATER USE TYPE	2021	2022	2023	2024	2025
Groundwater	133,602	134,724	135,846	136,968	138,090
Surface Water – USBR	30,000	37,200	0	0	45,000
Surface Water – FID	93,354	83,085	65,425	40,776	111,911
Recycled Water	1,912	2,911	3,911	4,910	5,910
TOTAL SUPPLY	**258,868**	**257,920**	**205,181**	**182,655**	**300,911**
Potable Demand	124,910	127,827	130,745	133,662	136,504
Non-Potable Demand	60,000	60,000	48,287	22,260	60,000
TOTAL DEMAND	**184,910**	**187,827**	**179,032**	**155,922**	**196,504**
AVAILABLE SUPPLIES	**73,958**	**70,093**	**26,149**	**26,732**	**104,407**

8 CITY OF FRESNO Water Shortage Contingency Plan

This WSCP is a detailed plan for how the City intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time.

The WSCP is used to provide guidance to the City's governing body and staff and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. Preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions due to extended drought and catastrophic supply interruptions.

IN THIS SECTION

- WSCP Overview

The WSCP describes the following:

1. **Water Supply Reliability Analysis:** summarizes the City's water supply analysis and reliability and identifies any key issues that may trigger a shortage condition
2. **Annual Water Supply and Demand Assessment Procedures:** describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions
3. **Six Standard Shortage Stages:** establishes water shortage levels to clearly identify and prepare for shortages
4. **Shortage Response Actions:** describes the response actions that may be implemented or considered for each stage to reduce gaps between supply and demand as well as minimize social and economic impacts to the community
5. **Communication Protocols:** describes communication protocols under each stage to ensure customers, the public, and government agencies are informed of shortage conditions and requirements
6. **Compliance and Enforcement:** defines compliance and enforcement actions available to administer demand reductions
7. **Legal Authority:** lists the legal documents that grant the City the authority to declare a water shortage and implement and enforce response actions
8. **Financial Consequences of WSCP Implementation:** describes the anticipated financial impact of implementing water shortage stages and identifies mitigation strategies to offset financial burdens
9. **Monitoring and Reporting:** summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation, with results used to determine if additional shortage response actions should be activated or if efforts are successful and response actions should be reduced
10. **WSCP Refinement Procedures:** describes the factors that may trigger updates to the WSCP and outlines how to complete an update
11. **Special Water Features Distinctions:** identifies exemptions for ponds, lakes, fountains, pools, and spas, etc.
12. **Plan Adoption, Submittal, and Availability:** describes the process for the WSCP adoption, submittal, and availability after each revision

The 2020 WSCP is a standalone document that can be modified as needed and is included as **Appendix J**.

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9 Demand Management Measures

This chapter discusses the City's demand management measures including its water waste prevention ordinances, metering program, public outreach, and water loss reduction measures.

The City employs several water conservation programs, in excess of State-mandated restrictions, to promote conservation and reduce the water supply demand. These measures help reduce overdraft of the groundwater aquifer that the City uses and have aided in the City's attainment of the urban water use reduction targets discussed in **Chapter 5**. The following sections provide a description of the Demand Management Measures (DMMs), including the nature and extent of each.

IN THIS SECTION

- Water Waste Prevention
- Metering
- Conservation Pricing
- Public Education and Outreach
- Water Loss Reduction Measures

9.1 Demand Management Measures for Retail

9.1.1 Water Waste Prevention Ordinances

The City prohibits water waste through implementation of the Urban Water Conservation and Excessive Water Use ordinance (see Section 6-520 of the Fresno Municipal Code). The ordinance includes such prohibitions as not washing hardscapes, using a nozzle-controlled hose, and using irrigation practices. The WSCP, included in **Appendix J**, Section 1.5, contains a more in-depth discussion of these prohibitions and consequences associated with them.

The City has a water waste hotline and a reporting form on the City website and keeps records of water waste violations. The City also employs fifteen staff persons year-round to manage and monitor the water conservation programs in place. Communication to the City's diverse customer base is always taken into consideration, so two of the positions require Spanish and Hmong languages. All Water Conservation Representatives use advanced metering infrastructure (AMI) to monitor and confirm excessive or negligent water waste incidents.

The Water Conservation staff can be reached at (559) 621-5300, (559) 621-5480, or (559) 621-CITY for after-hours emergencies. Online forms are also available to the public. Their office is located at 1910 E. University Avenue, Fresno, CA 93703. The Water Conservation Supervisor is Conrad Braganza.

9.1.2 Metering

In 2008, the City embarked on an aggressive project to install meters on all single-family residential service connections throughout its service area. The water meter project was completed at the end of 2012. The City already had water meters on all existing multifamily residential, commercial, industrial, landscape irrigation, and fire services.

With completion of the metering project, the City can now monitor water use more closely and provide its customers an understanding of water use (and its fiscal impacts), which has led to reducing water consumption by approximately 13% since 2013. The City will continue to monitor water use through the metering data and use the data to analyze demand trends and plan for future water shortages.

As part of the analysis of the meter data and through customer complaints or comments, the City is able to identify meters that are not working properly. Once identified, the City can have a maintenance crew visit the property and evaluate whether to repair or replace the meter.

The City also routinely tests and calibrates meters to ensure accuracy in reading and billing. Typically, meters are tested in place in the field or at a test bench in the meter shop. Field testing involves using calibrated flow meters to monitor the flow through a test port on or attached to the meter and comparing the measured flow to the meter reading. The majority of large meters, three inches and above, have a bypass valve that will be turned on during the meter test as not to disrupt water use to the property. In the case where a bypass valve is not in place, the customer is notified at least 48 hours before the test date. The City's service area has a total of approximately 135,000 meters, of which approximately 1,100 are three inches or larger. In 2018, of 157 of these large meters were tested, 10 were repaired, and 15 were replaced.

With the majority of meters being two inches or smaller, testing every single one is not logistically or economically feasible; therefore, a statistical sampling of each size is tested each year based on the following criteria:

- Meters six inches and above are tested annually.
- Meters three inches to four inches are tested at least once every two years.
- Meters three-fourths of an inch to two inches are sample tested as needed.

The City performs more frequent testing on larger meters on the basis that an error in their registration has a greater effect on customer equity and revenue issues. Meters registering larger volumes are given priority regardless of when they were last tested.

The City also shares meter data with the customers through its EyeOnWater tool available on its website or on a mobile app. This allows customers to monitor and better understand their hourly, daily, weekly, and monthly water usage, trends, and how they compare to average users.

9.1.3 Conservation Pricing

The City's customers are subject to the water rate structure adopted by the City Council through the Proposition 218 process. The approved rate structure has a base price designated by meter size and a volumetric rate for water usage. **Table 9-1** shows the rate structure.

The City will investigate the use of alternative rate structures in the future, which could have specific charges for usage to provide a fiscal incentive for customers to conserve water. This approach would permit customers to directly see the impact of water use reduction each month.

Table 9-1. Current Water Rate Structure

	BASE RATE		USAGE CHARGES	
METER SIZE	DOMESTIC	IRRIGATION	100 CUBIC FEET (HCF)	1,000 GALLONS
¾" or smaller	$13.50	$10.70	$1.74 (per each HCF)	$2.33 (per each 1,000 gallons)
1"	$17.90	$13.40		
1.5"	$20.80	$15.20		
2"	$35.30	$24.10		
3"	$52.80	$34.90		
4"	$79.00	$51.00		
6"	$152.00	$96.00		
8"	$705.00	$436.00		
10"	$1,113.00	$687.00		
12"	$1,462.00	$901.00		

9.1.4 Public Education and Outreach

The City has worked diligently to connect with and educate the community it serves. Those efforts include an emphasis on water conservation techniques and the importance of reducing overall water demand, both specifically to the resident (in terms of fiscal impacts) and to the overall water supply.

The City's varied programs to incentivize water savings are frequently discussed, including the following items:

- Water-wise landscape consultation
- EyeOnWater tool
- Irrigation efficiency audit
- Assistance with setting irrigation controllers
- Interior/exterior water leak surveys
- Water meter use information
- Water use rebates, coupons, and permits
- Lawn-to-garden rebates
- Water conservation hotlines

9.1.4.1 Education and Outreach

The City's water conservation public information program is managed in-house with the assistance of JP Marketing. The firm's services include strategic planning, creative concepts, public relations, marketing, promotion, research, advertising, media design, copywriting, event creation, and online services.

The City's public information program has many components, including multimedia campaigns (paid and public service advertising), customer billing inserts, literature, public outreach activities, a speaker's bureau, and inter-agency partnerships. Many of the City's water conservation materials are provided in three languages: English, Hmong, and Spanish.

The City is a member of the Central Valley Water Awareness Committee (CVWAC), which is composed of several cities, water utilities, irrigation districts, and other groups in the Central Valley. The CVWAC was created to increase the public's understanding of how water is treated, managed, and delivered to customers. The City participates in Water Awareness Month activities through its affiliation with the CVWAC.

The City conducted outreach to the community through approximately 50 events between 2015 and 2020, including:

- Setting up outreach booths providing water-saving info and rebate information at local festivals, parades, plant sales, home and garden shows, and fairs
- Participating in Annual Water Wise Plant Exchanges, a large community event to share water-wise plants and information and participate in hands-on activities
- Hosting Kids Water Camp, a large one-day event with hands-on activities for kids in third grade in all elementary schools in the service area
- Hosting workshops and speaker events about water-wise plants, gardening, and landscaping

A full list of specific education and outreach events over the past five years is included in **Appendix K**. The City also maintains a water conservation page on its website with links to many of the flyers and rebates mentioned above.

9.1.4.2 Water Surveys

The City conducted over 24,000 interior and exterior water leak surveys between 2015 and 2020. **Table 9-2** quantifies the number and types of surveys conducted.

Table 9-2. Interior and Exterior Surveys

DESCRIPTION/YEAR	2015	2016	2017	2018	2019	2020	TOTAL
EXTERIOR SURVEYS							
Exterior Audit	942	1,289	1,359	835	2,189	427	7,041
Landscape Consultation	605	382	193	139	149	48	1,516
Large Turf Survey	1	5	1	0	0	0	7
Timer Tutorial	1,644	1,967	1,873	2,170	1,346	518	9,518
INTERIOR SURVEYS							
Interior Audit	835	1,135	1,222	748	2,137	412	6,489
TOTALS	**4,027**	**4,778**	**4,648**	**3,892**	**5,821**	**1,405**	**24,571**

9.1.4.3 Rebate Programs

The City operates 14 rebate programs. Some of those that were active and used during the 2015–2020 reporting period are summarized in **Table 9-3**.

Table 9-3. Rebate Program Results (2015–2020)

	LAWN TO GARDEN		WASHING MACHINE		HIGH EFFIC. TOILET	
YEAR	NO.	REBATE	NO.	REBATE	NO.	REBATE
2015	122	$4,044	358	$46,144	301	$35,344
2016	160	$71,372	247	$27,600	233	$21,124
2017	103	$37,157	255	$19,682	495	$18,937
2018	43	$19,238	57	$5,502	145	$75,721
2019	42	$19,456	84	$8,000	115	$19,091
2020	25	$14,521	121	$6,950	106	$18,033
TOTALS	**495**	**$165,791**	**1,122**	**$113,880**	**1,395**	**$188,253**

9.1.5 Programs to Assess and Manage Distribution System Real Loss

As discussed in **Chapter 4**, the calculated loss was determined to be 8%, illustrating the City's conservative approach in the past. With completed system metering, the City is able to track losses more closely and understand where possible losses are occurring and correct them as necessary.

The AWWA Water Audit Tool suggested the areas the City could improve to reduce system losses, including calibration of source meters, unauthorized consumption, and data handling errors.

The following measures are in place or are being developed to improve the system losses:

- The City installed the remaining source meters on the few unmetered wells within the system in 2017, and now currently all wells and production facilities are fully metered.
- The City has a source meter calibration plan in place.
- The City has implemented meter testing frequency based on service size. This is discussed in more detail in **Section 9.1.2**.
- The City has an online tool as well as a telephone hotline available for the public to report water leaks, either on their property or within the public rights-of-way. This helps reduce detection time and limits the water loss from leaks.
- The City conducted a leak survey on 100 miles of the water system in January 2016. Eight total leaks were pinpointed, one on the main, two on hydrants, two on water service lines, and one at a water meter.
- The City uses meter data to identify any meters not functioning correctly or any leaks in the system so that they can be replaced or repaired. This helps reduce unaccounted for water consumption.

Unauthorized consumption can be determined, at times, through the meter data also. If a meter shows no usage, the City can note the address and schedule a site visit to determine any possible issues.

9.1.6 Other Demand Management Measures

In addition to the water conservation programs, the City has also enacted watering schedules for the community that specify days and times that customers are allowed to water, based on odd or even street addresses. The City has also created an automated courtesy notice program that informs customers when they exceed the excessive water use threshold during days and times when outdoor watering is not allowed.

9.2 Implementation to Achieve Water Use Targets

As discussed in **Chapter 5**, the City has met and exceeded its 2020 water use target. However, the City also realizes a portion of the observed conservation is due to the strict water use restrictions imposed during the drought. If those restrictions are lifted, the City will be diligent in continuing use of the above described DMMs.

The extensive metering program, replacement of turf, and replacement of over 10,000 high-water-use appliances (toilets and washing machines) over the last several years has helped the City maintain overall lower water consumption.

9.3 Water Use Objectives (Future Requirements)

As discussed in **Section 4.2.4.4**, the City is tracking the recommended water use efficiency standards and water use objectives developed due to Senate Bill 606 and Assembly Bill 1668. Currently no water use objectives have been adopted by the State, and are not anticipated to be adopted until 2022, but an indoor residential water use standard has been recommended by DWR, and additional standards are expected to be released in late 2021. The City is aware of the legislation and tracking the forthcoming water use objectives as they are available. The City is currently having ongoing discussions with DWR on clarifying the GIS-based approach for developing the overall water objective for residential customers. Alternatively, the City is also interested in using actual water use data (from the AMI system) to develop these objectives, following discussions and approval from DWR and SWRCB.

10 CITY OF FRESNO Plan Adoption, Submittal, and Implementation

This section provides guidance in the adoption, submittal, and implementation of the 2020 UWMP and WSCP, as well as processes for amending the adopted plans if needed.

This UWMP update has been prepared on a calendar-year basis and includes all water use and planning data for the 2020 calendar year. Additional details are provided in the preceding chapters.

IN THIS SECTION

- Public Hearing Notices
- Plan Adoption and Submittal

10.1 Notice of Public Hearing

The City has notified the County of Fresno, the only city or county in which the City provides water, of its intent to review the UWMP and consider changes to the plan. The City also notified the City of Clovis of plan preparation. Both of these governmental entities as well as a host of local water purveyors and agencies (**Table 2-1**) were notified of the preparation of the UWMP and public hearing and were encouraged to participate in the development of this plan update. Copies of the notification letters are included in **Appendix L**.

Consistent with the legislative requirements for public noticing, the City published two notices in the Fresno Bee, at least five days apart over a two-week period, providing the date and time of the public hearing. The notices were published on July 1, 2021, and July 8, 2021.

10.2 Public Hearing and Adoption

The City held a public hearing and adopted the 2020 UWMP on July 15, 2021. A copy of the adopting resolution is included in **Appendix M**. Before the public hearing, notices were published notifying the public of the date and time of the hearing.

10.3 Plan Submittal

Once the 2020 UWMP and WSCP have been adopted, a copy of the 2020 UWMP and WSCP and any subsequent amendments will be submitted to DWR, the State Library, and the County of Fresno.

10.4 Public Availability

Once the plan has been adopted, a hard copy will be made available for public reference at the City of Fresno Department of Public Utilities office at City Hall (located at 2600 Fresno Street) and the Water Division office (located at 1910 E. University Avenue). Additionally, an electronic copy will be uploaded to the City of Fresno website and made available for public reference.

11 CITY OF FRESNO References

Applied Development Economics, Inc. and Mintier Harnish Associates. (2017). *Fresno County 2050 Growth.*

California Department of Finance. (2020, May). *E-4 Population Estimates for Cities, Counties, and the State.* Retrieved from State of California Department of Finance: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-4/2010-20/

California Department of Water Resources. (Feb 2016). *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use.*

California Department of Water Resources. (January 2006). *Bulletin 118 - San Joaquiv Valley Groundwater Basin, Kings Subbasin.*

California Department of Water Resources, State Water Resources Control Board. (November 2018). *Making Water Conservation a California Way of Life.*

California Regional Water Qulaity Control Board. (2018). Order R5-2018-0080 Waste Discharge Requirements for Cities of Fresno and Clovis Regional Wastewater Reclamation Facility .

Carollo. (2010). Recycled Water Master Plan. City of Fresno.

Carollo. (2019). Citywide Recycled Water Demand and Southwest Recycled Water System Analysis . City of Fresno.

CH2MHill. (1992). *City of Fresno Metropolitan Water Resources Management Plan, Phase 1 Report, Volume II or II, Appendix B Hydrogeologic Conditions in the FCMA.*

City of Fresno Development and Resource Management Department. (2014). *Fresno General Plan .*

City of Fresno Development and Resource Management Department. (2017). *Fresno General Plan 2015 - 2023 Housing Element.*

City of Fresno Planning and Development Department. (2020). *2019 Housing Element Annual Progress Report.*

Department of Water Resources. (2018). *Guidance for Climate Change Data Use during Groundwater Sustainability Plan.*

First Carbon Solutions. (2014). *Master Environmental Impact Report General Plan and Development Code Update City of Fresno, Fresno County, California.*

Fresno City Water, Engineering Department. (1940). Average of Groundwater Depth for City of Wells Log.

History of SJRECWA Exchange Contractors. (n.d.). Retrieved 03 18, 2021, from San Joaquin River Exchange Contractrs Water Authority: http://www.sjrecwa.net/about/history/

John Carollo Engineers. (1969). *Report on Water Resources City of Fresno.*

Kings River Water Association and Kings River Conservation District. (June 2003). *The Kings River Handbook, pg. 7.*

LSA. (2020). *Fresno General Plan Public Review Draft Program Environmental Impact Report.*

Partida, C. K. (2020, November 15). Planning for a shorter rainy season and more frequent extreme storms in California. *California WaterBlog*. Retrieved from https://californiawaterblog.com/2020/11/15/planning-for-a-shorter-rainy-season-and-more-frequent-extreme-storms-in-california/

Persad, G. G. (2020, October). Inter-model agreement on projected shifts in California hydroclimate characteristics critical to water management. *Climatic Change*. Retrieved from https://doi.org/10.1007/s10584-020-02882-4

Provost & Pritchard. (November 2019). *North Kings Groundwater Sustainability Plan.* North Kings Groundwater Sustainability Agency.

WateReuse Research Foundation. (2013). *Demonstration of Filtration and Disinfection Compliance Through Soil-Aquifer Treatment.*

West Yost Associates. (January 2014). *City of Fresno Metropolitan Water Resources Management Plan Update Addendum.*

WRIME. (2007). The Integrated Groundwater and Surface Water Model prepared for the Kings Basin Integrated Regional Water Management Authority.

A

2020 UWMP Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Executive Summary
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Chapter 2, Section 10.2
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.1
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.1, Section 10.1
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	N/A
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.1 and 3.2
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Table 3-2 Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Table 3-3 Section 3.4.1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.3.1
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Table 3-3 Section 3.4.1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Table 3-1 Section 3.1.1, Section 4.2.4.1, Table 4-3, Figure 4-3,
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Losses included Section 4.2.2, City has not adopted loss standards

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	Table 4-5 Section 4.2.4.2
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.5.2
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Table 4-1 Section 4.2.2
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Table 4-9 Section 4.3
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Table 5-1 Section 5.4 Appendix C
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.5 Appendix C
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	N/A
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	N/A
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Appendix C
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 6.1-6.4 Section 7.1.3
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change*.	System Supplies	Section 6.8.2.1
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.8
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.7
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Table 6-7 and Table 6-8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.1
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.1 Appendix G
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.1.1
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	N/A
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.1.2
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.1.6 Figure 6-6
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.1.5 Table 6-1
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6-6
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.4.2, Appendix B Table 6-3R
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.4.4 Table 6-5
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.4.4
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.4.4 Table 6-6
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.4.5
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.4.5
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.5
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.4.2, Appendix B Table 6-3R

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.7
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.9
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1.1
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.1.2
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.1.4
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.1.3.3
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.1.3
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.1.4 Table 7-1, Table 7-2, and Table 7-3
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.1.3 and 7.1.4
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix J
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix J - Section 1.2
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix J - Section 1.10

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix J - Section 1.3
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix J - Section 1.3
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix J - Section 1.4 Table 2
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix J - Section 1.4 Figure 2
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix J - Section 1.5.3 Table 4
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix J - Section 1.5.2 Table 3
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix J - Section 1.5.4
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix J - Section 1.5.1
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix J - Section 1.5.2 Table 3
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix J - Section 1.5.6
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix J - Section 1.6
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix J - Section 1.6
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix J - Section 1.7
x		Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix J - Section 1.8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix J - Section 1.8
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix J - Section 1.8
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix J - Section 1.9
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix J - Section 1.9
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Appendix J - Section 1.9
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix J - Section 1.10
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix J - Section 1.12
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix J - Section 1.13
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Appendix J - Section 1.13
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9.1
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.2
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.1, Table 2-1, Appendix L

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Appendix L
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Appendix L
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Appendix M
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	TBD

B

DWR Standardized Tables

2-1R | Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA1010007	CITY OF FRESNO	139,523	121,994
	Total:	**139,523**	**121,994**

Note: Data provided by City of Fresno Water Division

2-2 | Public Water Systems

Type of Plan	Member of RUWMP	Member of Regional Alliance	Name of RUWMP or Regional Alliance
Individual UWMP	No	No	N/A

2-3 | Agency Identification

Type of Supplier	Year Type	First Day of Year		Unit Type
		DD	MM	
Retailer	Calendar Years			Acre Feet (AF)

Conversion to Gallons: *325851*
Conversion to Gallons per Day: *892.7425*

2-4R | Water Supplier Information Exchange

Wholesale Water Supplier Name
United States Bureau of Reclamation
Fresno Irrigation District

3-1R | Current & Projected Population

Population Served	2020	2025	2030	2035	2040	2045
Total	550,217	609,433	674,677	719,327	765,278	812,529

4-1R | Actual Demands for Water

Use Type	Additional Description	Level of Treatment When Delivered	2020 Volume
Single Family		Drinking Water	60,065
Multi-Family		Drinking Water	18,842
Commercial		Drinking Water	16,971
Industrial		Drinking Water	5,729
Institutional/Governmental	See Note 1	Drinking Water	---
Landscape		Drinking Water	10,478
Other	Travel Meters	Drinking Water	340
Losses		Drinking Water	9,568
Groundwater Recharge		Raw Water	42,686
		Total:	**164,679**

Notes:
1. Institutional and Governmental water usage is included in the Commercial use type.

4-2R | Projected Demands for Water

Use Type	Additional Description	Projected Water Use				
		2025	2030	2035	2040	2045
Single Family		76,255	80,429	82,934	85,437	87,936
Multi-Family		19,000	20,654	21,737	22,831	23,935
Commercial		19,052	21,135	22,587	24,041	25,496
Industrial		7,410	9,003	9,922	10,841	11,758
Institutional/Governmental	See Note 1					
Landscape		4,490	5,035	5,422	5,809	6,196
Other	Travel Meters	200	200	200	200	200
Losses		10,097	10,900	11,408	11,917	12,426
Groundwater Recharge	Raw Water	62,700	65,400	68,100	70,800	73,500
Total:		**199,204**	**212,756**	**222,310**	**231,876**	**241,447**

Notes:
1. Institutional and Governmental water usage is included in the Commercial use type.

4-3R | Total Gross Water Use

	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	164,679	199,204	212,756	222,310	231,876	241,447
Recycled Water Demand From Table 6-4R	4,757					
Total Water Use:	**169,436**	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**

Note: Recycled water supply is a potable water offset, thus the recycled water demand in years 2025-2045 is included in the potable and raw water demand total.

4-4R | 12 Month Water Loss Audit Reporting

Report Period Start Date		Volume of Water Loss*
MM	YYYY	
1	2016	9,036
1	2017	10,235
1	2018	9,028
1	2019	9,059
1	2020	9,568

*For years 2016, through 2019, volume of water loss is taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. For 2020 the volume of water loss is estimates as the difference in metered water produced and entered into the distribution system and metered consumption.

4-5R | Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? Refer to Appendix K of UWMP Guidebook.	Yes
Section or page number where the citations utilized in the demand projects can it be found:	Section 4.2.4.2
Are Lower Income Residential Demands Included in Projections?	Yes

5-1R | Baselines & Targets Summary

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target *
10-15 Year	1999	2008	309	247
5 Year	2003	2007	304	N/A

*All values are in Gallons per Capita per Day (GPCD)

5-2R | 2020 Compliance

Actual 2020 GPCD*	Optional Adjustments to 2020 GPCD					2020 GPCD* (Adjusted if applicable)	Supplier Achieved Targeted Reduction in 2020
	Extraordinary Events*	Economic Adjustment*	Weather Normalization*	Total Adjustments*	Adjusted 2020 GPCD*		
198	0	0	0	0	0	0	Yes

*All values are in Gallons per Capita per Day (GPCD)

6-1R | Groundwater Volume Pumped

Groundwater Type	**Location or Basin Name**	**2016**	**2017**	**2018**	**2019**	**2020**
Alluvial Basin	San Joaquin Groundwater Basin: Kings Subbasin	99,107	105,211	76,796	54,609	55,028
	Total:	**99,107**	**105,211**	**76,796**	**54,609**	**55,028**

6-2R | Wastewater Collected within Service Area in 2020

The supplier will complete the table.						
			Percentage of 2020 service area covered by wastewater collection system (optional):			
			Percentage of 2020 service area population covered by wastewater collection system (optional):			
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Wastewater Volume Collected from UWMP Service Area in 2020**	**Name of Wastewater Agency Receiving Collected Wastewater**	**Wastewater Treatment Plant Name**	**Wastewater Treatment Plant Located within UWMP Area**	**WWTP Operation Contracted to a Third Party**
City of Fresno	Metered	63,652	**City of Fresno**	RWRF	Yes	No
City of Fresno	Metered	325	**City of Fresno**	NFWRF	Yes	No
	Total:	**63,977**				
Note: Wastewater Volume in units of AF						

6-3R | Wastewater Treatment & Discharge Within Service Area in 2020

The supplier will complete the table.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number	Method of Disposal	Plant Treats Wastewater Generated Outside the Service Area	Treatment Level	2020 Volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
RWRF	Treatment Site	Onsite Percolation Ponds	WDR Order R5-2018-0080	Percolation ponds	Yes	Secondary, Undisinfected	63,652	58,949	-	3,845	-
RWRF	Treatment Site	Onsite Percolation Ponds	WDR Order R5-2018-0080	Percolation ponds	Yes	Tertiary			858	-	-
NFWRF	Treatment Site	Onsite Pond	WDR Order R5-2014-0162	Percolation ponds	No	Tertiary	325	271	54	-	-
						Total:	**63,977**	**59,220**	**912**	**3,845**	**-**

6-4R | Recycled Water Direct Beneficial Uses Within Service Area

The supplier will complete the table.										
Name of Supplier Producing (Treating) the Recycled Water:			City of Fresno							
Name of Supplier Operating the Recycled Water Distribution System:			City of Fresno							
Supplemental Volume of Water Added in 2020:										0%
Source of 2020 Supplemental Water:			N/A							
Beneficial Use Type	**Potential Beneficial Uses of Recycled Water**	**Amount of Potential Uses of Recycled Water**	**General Description of 2020 Uses**	**Level of Treatment**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Agricultural Irrigation	Non-food crop irrigation	7,900	Irrigate non-food crops	Secondary, Undisinfected	3,845	7,900	7,900	7,900	7,900	7,900
Landscape Irrigation (excludes golf courses)	Landscape Irrigation	5,800	Landscape irrigation, distribtued through the southwest recycled water distribution system	Tertiary	858	5,800	5,800	5,800	5,800	5,800
Agricultural Irrigation	Food crop irrigation	410	Irrigate limited food crops, distribtued through the southwest recycled water distribution system	Tertiary	-	410	410	410	410	410
Golf Course Irrigation	Landscape Irrigation	110	Copper River Golf Course	Tertiary	54	110	110	110	110	110
				Total:	**4,757**	**14,220**	**14,220**	**14,220**	**14,220**	**14,220**
Internal Reuse (Not included in Statewide Recycled Water Volume).					11	30	30	30	30	30

6-5R | 2015 Recycled Water Use Projection Compared to 2020 Actual

The supplier will complete the table.

Use Type	2015 Projection for 2020	2020 Actual Use
Agricultural Irrigation	14,200	3,845
Landscape Irrigation (excludes golf courses)	4,300	858
Golf Course Irrigation		54
Commercial Use		
Industrial Use	1,400	
Geothermal and Other Energy Production		
Seawater Intrusion Barrier		
Recreational Impoundment		
Wetlands or Wildlife Habitat		
Groundwater Recharge (IPR)*	1,300	
Surface Water Augmentation (IPR)*		
Direct Potable Reuse		
Total:	**21,200**	**4,757**

6-6R | Methods to Expand Future Recycled Water Use

The supplier will complete the table below.			
Name of Action	**Description**	**Planned Implementation Year**	**Expected Increase of Recycled Water Use**
Build Infrastructure	Recycled Water Distribution System Expansion	2021	5,000
		Total:	**5,000**

6-7R | Expected Future Water Supply Projects or Programs

Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.						
Page Location for Narrative in UWMP:			Section 6.7			
Name of Future Projects or Programs	**Joint Project with Other Suppliers**	**Agency Name**	**Description**	**Planned Implementation Year**	**Planned for Use in Year Type**	**Expected Increase in Water Supply to Supplier**
Expansion of Tertiary Recycled Water Treatment	No		See Section 6.7		All Year Types	
Expansion of Surface Water Treatment Capacity	No		See Section 6.7		All Year Types	
Expansion of Groundwater Recharge Program	No		See Section 6.7		All Year Types	

6-8R | Actual Water Supplies

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield
Groundwater (not desalinated)		55,028	Drinking Water	
Surface water (not desalinated)	USBR CVP	37,447	Drinking Water	
Surface water (not desalinated)	FID Contract	71,292	Drinking Water	
Recycled Water	RWRF	858	Recycled Water	
Recycled Water	NFWRF	54	Recycled Water	
	Total:	**164,679**		**-**

6-8DS | Source Water Desalination

Neither groundwater nor surface water are reduced in salinity prior to distribution. The supplier will not complete the table.

6-9R | Projected Water Supplies

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Groundwater (not desalinated)	Kings Subbasin	138,090		143,630		149,100		154,490		159,820	
Surface water (not desalinated)	USBR CVP	60,000		60,000		60,000		60,000		60,000	
Surface water (not desalinated)	FID Contract	125,030		131,600		131,600		131,600		131,600	
Recycled Water	NFWRF Tertiary Disinfected	5,800		5,800		5,800		5,800		5,800	
Recycled Water	RWRF Tertiary Disinfected	110		110		110		110		110	
Total:		**329,030**	**-**	**341,140**	**-**	**346,610**	**-**	**352,000**	**-**	**357,330**	**-**

7-1R | Basis of Water Year Data (Reliability Assessment)

Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.	
Page Location for Narrative in UWMP:	See Section 7.1.3 in the UWMP

7-2R | Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	329,030	341,140	346,610	352,000	357,330
Demand Totals From Table 4-3R	199,204	212,756	222,310	231,876	241,447
Difference:	**129,826**	**128,384**	**124,300**	**120,124**	**115,883**

7-3R | Single Dry Year Supply & Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals	189,852	195,392	200,862	206,252	211,582
Demand Totals	164,092	176,132	184,174	192,228	200,287
Difference:	**25,760**	**19,260**	**16,688**	**14,024**	**11,295**

7-4R | Multiple Dry Years Supply & Demand Comparison

		2025	2030	2035	2040	2045
First Year	**Supply Totals**	273,725	279,265	284,735	290,125	295,455
	Demand Totals	199,204	212,756	222,310	231,876	241,447
	Difference:	**74,521**	**66,509**	**62,425**	**58,249**	**54,008**
Second Year	**Supply Totals**	274,626	280,166	285,636	291,026	296,356
	Demand Totals	199,204	212,756	222,310	231,876	241,447
	Difference:	**75,422**	**67,410**	**63,326**	**59,150**	**54,909**
Third Year	**Supply Totals**	217,568	223,108	228,578	233,968	239,298
	Demand Totals	190,267	193,637	197,736	201,753	205,708
	Difference:	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
Fourth Year	**Supply Totals**	189,852	195,392	200,862	206,252	211,582
	Demand Totals	162,551	165,920	170,020	174,036	177,992
	Difference:	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
Fifth Year	**Supply Totals**	314,840	320,380	325,850	331,240	336,570
	Demand Totals	199,204	212,756	222,310	231,876	241,447
	Difference:	**115,636**	**107,624**	**103,540**	**99,364**	**95,123**

7-5 | Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)

2021	**Gross Water Use**	184,910
	Total Supplies	240,905
	Surplus/Shortfall without WSCP Action	**55,995**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**55,995**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2022	**Gross Water Use**	187,827
	Total Supplies	244,448
	Surplus/Shortfall without WSCP Action	**56,621**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**56,621**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2023	**Gross Water Use**	170,051
	Total Supplies	196,200
	Surplus/Shortfall without WSCP Action	**26,149**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**26,149**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2024	**Gross Water Use**	151,432
	Total Supplies	178,164
	Surplus/Shortfall without WSCP Action	**26,732**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**26,732**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2025	**Gross Water Use**	196,504
	Total Supplies	300,911
	Surplus/Shortfall without WSCP Action	**104,407**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**104,407**
	Resulting Percent Use Reduction from WSCP Action	**0%**

8-1 | Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage[1]	Water Shortage Condition
0		No water shortage condition. Corresponds with year-round water use measures listed in Section 1.5.1 and demand reduction measures listed for "All" stages in Table 3.
1	0-10%	Stage 1 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 100% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 2 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
2	10-25%	Stage 2 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 90% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 3 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
3	25-35%	Stage 3 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 75% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 4 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
4	35-50%	Stage 4 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 65% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 5 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
5	>50%	Stage 5 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 50% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment.

[1]Shortage levels indicate the gap between supply and demand compared to normal-year conditions. The Annual Assessment incorporates a 10% buffer on top of projected demands for conservative planning.
[2]Water year types were defined 2006 San Joaquin River Restoration Settlement Agreement for USBR allocations and characterized in Section 6.2 of the City's 2020 UWMP.

8-2 | Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement[2]
All	Expand Public Information Campaign	Not Applicable	Community outreach includes classroom presentations, outreach educational information, and water tours. Increase communication as drought stages increase.	Not Applicable
All	Improve Customer Billing	Not Applicable	Water bills show customer usage vs. average usage for the customer category. Increase customer notifications of high water use based on advanced metering infrastructure (AMI) data as drought stages increase.	Not Applicable
All	Offer Water Use Surveys	Not Applicable	Use water leak surveys with all community members.	Not Applicable
All	Provide Rebates for Landscape Irrigation Efficiency	Not Applicable	The City offers rebates for micro-irrigation conversions, soil moisture sensors, smart irrigation controller, and rain sensors to improve efficiencies.	Not Applicable
All	Provide Rebates for Turf Replacement	Not Applicable	The City provides rebates for community members who wish to replace their turf with a drought-resistant garden.	Not Applicable
All	Provide Rebates on Plumbing Fixtures and Devices	Not Applicable	The City offers rebates on a variety of high-efficiency plumbing fixtures, such as washers, toilets, and urinals.	Not Applicable
All	Decrease Line Flushing	Not Applicable	The City uses NO-DES for regular pipe flushing to eliminate discharging water.	Not Applicable
All	Reduce System Water Loss	Not Applicable	The City has a comprehensive system water loss reduction program in place. Increase efforts to correct water system losses as drought stages increase.	Not Applicable
1	Decrease Line Flushing	0 to 100% of shortage gap	For dead-end flushing where the NO-DES truck cannot be used, reduce normal flushing time.	Not Applicable
1	Increase Water Waste Patrols	0 to 100% of shortage gap	Increase monitoring of AMI reporting and communication with customers; Conduct patrols based on public input.	Not Applicable
1	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Voluntary limits: Summer: three days/week Winter: one day/week	No
2	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: three days/week Winter: one day/week	Yes
3	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: two days/week Winter: one day/week	Yes
4	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: one day/week Winter: one day/week	Yes
4	Other — Prohibit use of potable water for construction and dust control	0 to 100% of shortage gap	The City provides rebates for community members who wish to replace their turf with a drought resistant garden	No
4	Other — Prohibit use of potable water for construction and dust control	0 to 100% of shortage gap	Prohibit use of potable water for construction, compaction, dust control, street or parking lot sweeping, and building washdowns where non-potable or recycled water is sufficient.	Yes
4	Other — Prohibit vehicle washing except at facilities using recycled or recirculating water	0 to 100% of shortage gap	Prohibit washing cars, boats, trailers, aircraft, or other vehicles, except at commercial or fleet vehicle-washing facilities using water recycling equipment.	Yes
4	Pools and Spas - Require covers for pools and spas	0 to 100% of shortage gap	Require covers for swimming pools when not in use.	No
4	Other	0 to 100% of shortage gap	Prohibit use of potable water for sewer system maintenance or fire protection training without prior approval by the City manager.	Not Applicable
4	Other	0 to 100% of shortage gap	Prohibit use of outdoor misters.	No
5	Landscape — Prohibit all landscape irrigation	0 to 100% of shortage gap	Prohibit outdoor irrigation year-round.	Yes
5	Moratorium or Net Zero Demand Increase on New Connections	0 to 100% of shortage gap	The City will temporarily limit or ban new water service connections within the service area.	Not Applicable

[1]Reduction in the shortage gap is estimated and can vary significantly.
[2]Refer to WSCP Section 1.7 for Penalties for Water Wastage.

8-3R | Supply Augmentation & Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
1 to 5	Transfers	As Needed	Purchase or exchange available USBR or FID surface water
1 to 5	Other Purchases	As Needed	Interconnection with City of Clovis for use in emergencies

10-1R | Notification to Cities & Counties

City	60 Day Notice	Notice of Public Hearing	Other
City of Clovis	Yes	Yes	
County	**60 Day Notice**	**Notice of Public Hearing**	**Other**
County of Fresno	Yes	Yes	
Other	**60 Day Notice**	**Notice of Public Hearing**	**Other**
Bakman Water Company	Yes	Yes	
Fresno Irrigation District	Yes	Yes	
Fresno Metropolitan Flood Control District	Yes	Yes	
Friant Water Authority	Yes	Yes	
Garfield Water District	Yes	Yes	
Malaga County Water District	Yes	Yes	
North Kings Groundwater Sustainabilty Agency	Yes	Yes	
Pinedale County Water District	Yes	Yes	
United Stated Bureau of Reclamation South-Central California Area Office	Yes	Yes	

C

SBx7-7 Tables and Verification Form

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	2020 Target GPCD
309	247
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target*	Calculated 2020 Target *Fm Appropriate Target Table*	Confirmed 2020 Target
304	288	247	247
** Maximum 2020 Target is 95% of the 5 Year Baseline GPCD*			
NOTES:			

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)*					2015 GPCD *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015?
		Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD		
190	278	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	0	189.745674	189.745674	YES
NOTES:								

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☑	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	550,217
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	121,994	-	-	-	-	-	**121,994**
*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES:							

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Groundwater
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	55,028	-	55,028

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Surface Water- NESWTF
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	20,724		20,724

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Surface Water- SESWTF
This water source is *(check one)* **:**	

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	45,367		45,367

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Surface Water- T-3 SWTF

This water source is *(check one)* **:**

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	875		875

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 5

This water source is *(check one)* **:**

☐	The supplier's own water source
☐	A purchased or imported source

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
121,994	550,217	**198**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]	TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
198	-	-	-	-	198	247	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

D

City of Fresno's Reduce Delta Reliance Reporting

Appendix D - Delta Reliance

1. Background

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action (e.g., a proposed project) in the Sacramento-San Joaquin Delta (Delta), prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council.

Anyone may appeal a certification of consistency. If the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency. The covered action may be implemented if either: 1) no appeal is filed; or 2) the Delta Stewardship Council denies the appeal to the revised certification of consistency.

The City of Fresno (City) contracts with the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) Friant Division for an annual supply of 60,000 af of Class 1 water through an agreement originally executed in January 1961. Although the Friant Division of the CVP does not pull water from the Delta, the project was developed through an exchange agreement reached in 1939 with the Delta-Mendota supply that provides water to the Exchange Contractors[1] with historic pre-1914 San Joaquin River water rights. As restrictions on Delta exports have hindered USBR from making deliveries to the Delta-Mendota Canal, the Exchange Contractors can call on their historic rights, which reduces the Friant Division Class 1 allocations. As such, the City is required to demonstrate consistency with the Delta Plan's policy to reduce reliance on the Delta.

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

[1] The Exchange Contractors are the benefactors of the historic pre-1914 water rights established by Miller and Lux. These contracts include: Central California Irrigation District; San Luis Canal Company; Firebaugh Canal Water District; and Columbia Canal Company, per http://www.sjrecwa.net/history.html (accessed March 10, 2021).

(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:

(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);

(2) That failure has significantly caused the need for the export, transfer, or use; and

(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:

(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;

(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and

(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self- reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).

The analysis and documentation provided below include all the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action.

2. Methodology

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for improved regional self-reliance and measurable reduction in Delta reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta. The expected outcomes for the City's regional self-reliance and reduced Delta reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 issued in March 2020 (Guidebook Appendix C), including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources.

All data were obtained from planning documents adopted by the City Council, including the current and previous UWMPs and Metropolitan Water Resource Management Plan (Metro Plan) and represent average or normal water year conditions. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the UWMP Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

To calculate the expected outcomes for improved regional self-reliance and reduced Delta reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from the City's 2008 UWMP. Consistent with the 2010 baseline data approach, the expected outcomes for improved regional self-reliance and reduced Delta reliance for 2015 and 2020 were taken from the City's 2010 and 2015 UWMPs, respectively. Expected outcomes for 2025-2045 are from the current 2020 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

3. Demonstration of Regional Self-Reliance

3.1 Service Area Demands without Water Use Efficiency

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as the City that do not explicitly quantify water use efficiency savings in their UWMPs can calculate their embedded water use efficiency savings based on changes in forecasted per capita water use since the baseline.

Agencies that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. **Table 1** (included at the end of this appendix) shows the results of this adjustment for the City. Supporting narratives and documentation for all the data shown in Table 1 are provided below.

Service Area Demands with Water Use Efficiency

The service area demands shown in Table 1 represent the total water demands for the City's service area. The demand data shown in Table 1 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 6-5
- 2015: Fresno 2010 UWMP, Table 7-2
- 2020: Fresno 2015 UWMP, Table 4-4
- 2025-2045: Fresno 2020 UWMP, Table 4-6

Non-Potable Water Demands

The non-potable water demands shown in Table 1 represent recycled water use that offsets potable water use in the City's service area. The demand data shown in Table 1 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 10-7
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-14
- 2025-2045: Fresno 2020 UWMP, Table 4-7

Potable Service Area Demands with Water Use Efficiency

Subtract "Non-Potable Water Demands" from "Service Area Demands with Water Use Efficiency."

Service Area Population

The population data shown in Table 1 were collected from the following sources:

- Baseline (2010) and 2015: Fresno 2015 UWMP, Table 5-1
- 2020-2045: Fresno 2020 UWMP, Table 3-3

Estimated Water Use Efficiency Since Baseline

The "Per Capita Water Use" calculated using "Potable Service Area Demands with Water Use Efficiency" divided by "Service Area Population". The "Change in Per Capita Water Use from Baseline" was then calculated by comparing with 2010 Per Capita Water Use. Finally, the "Estimated Water Use Efficiency Since Baseline" was calculated by multiplying the "Change in Per Capita Water Use from Baseline" by the population for one (1) year.

Service Area Water Demands without Water Use Efficiency

Add "Service Area Demands with Water Use Efficiency" to "Estimated Water Use Efficiency Since Baseline."

3.2 Supplies Contributing to Regional Self-Reliance

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table 2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in **Table 2** (included at the end of this appendix) represent efforts to improve regional self-reliance for the City's entire service area and include the total contributions of the City and its customers. Supporting narratives and documentation for all of the data shown in Table 2 are provided below.

Estimated Water Use Efficiency Since Baseline

The water use efficiency information shown in Table 2 is taken directly from Table 1.

Water Recycling

The water recycling information shown in Table 2 is taken from the Non-Potable Water Demands row in Table 1.

Local and Regional Water Supply and Storage Programs

The values shown in Table 2 represent groundwater supplies considering both natural recharge and intentional recharge. The supply data shown in Table 2 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 4-9
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-14

- 2025-2045: Fresno 2020 UWMP, Table 6-8

Other Programs and Projects the Contribute to Regional Self-Reliance

The values shown in Table 2 represent Kings River supplies considering both contracted supplies and recycled water exchange supplies. The supply data shown in Table 2 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 4-11
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-5
- 2025-2045: Fresno 2020 UWMP, Table 6-8

Water Supplies Contributing to Regional Self Reliance

Sum of:

- Estimated Water Use Efficiency Since Baseline
- Water Recycling
- Local and Regional Water Supply and Storage Programs
- Other Programs and Projects the Contribute to Regional Self-Reliance

Percent of Water Supplies Contributing to Regional Self-Reliance

“Water Supplies Contributing to Regional Self Reliance” divided by “Service Area Water Demands without Water Use Efficiency” (from Section 3.1).

3.3 Conclusions

The results shown in Table 2 demonstrate that the City’s service area is measurably improving its regional self-reliance. The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for the City’s regional self-reliance:

- Near-term (2025): The expected outcome for normal water year regional self-reliance is expected to increase by 129,700 AFY from the 2010 baseline; this represents an increase of about 31 percent of 2025 normal water year demands (Table 2).
- Long-term (2045): The expected outcome for normal water year regional self-reliance is expected to increase by more than 191,600 AFY from the 2010 baseline, this represents an increase of about 14 percent of 2045 normal water year retail demands (Table 2).

The results show that the City is measurably improving regional self-reliance, both as an amount of water used and as a percentage of water used.

4. Demonstration of Reduced Reliance on the Delta

The City's service area reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures.

4.1 Calculation of Reliance on Water Supplies from the Delta Watershed

The calculation of reliance on water supplies from the Delta watershed, shown in **Table 3** (included at the end of this appendix), is based on the following assumptions.

CVP/SWP Contract Supplies

The City water supplies with a connection to the Delta watershed are CVP/SWP Contract Supplies. The supply data shown in Table 3 is for anticipated average yield from the City's USBR contract and were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 4-6
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-14
- 2025-2045: Fresno 2020 UWMP, Table 6-2

Water Supplies from the Delta Watershed

Equal to "CVP/SWP Contract Supplies."

Percent Change in Supplies from the Delta Watershed

Divides "Water Supplies from the Delta Watershed" by "Service Area Demands without Water Use Efficiency" (from Section 3.1) and calculates changes from the 2010 baseline.

4.2 Conclusions

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for the City's Delta reliance on supplies from the Delta watershed:

- Near-term (2025): The expected outcome for normal water year reliance on supplies from the Delta watershed is expected to decrease by 4,520 AF from the 2010 baseline. With Delta water representing 25.5% of service area water demand without water use efficiency, this represents a decrease from the 2010 baseline of 10.1% (Table 3).
- Long-term (2045): The expected outcome for normal water year reliance on supplies from the Delta watershed is expected to decrease by 4,520 AF from the 2010 baseline. With Delta water representing 19.5% of service area water demand without water use efficiency, this represents a decrease from the 2010 baseline of 16.2% (Table 3).

The results shown in Table 3 demonstrate that City is measurably reducing reliance on the Delta, both as an amount of water used and as a percentage of water used.

5. UWMP Implementation

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta[.]*

In accordance with Water Code Section 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Chapter 6 of the City's 2020 UWMP summarizes the implementation of future water projects and continued progress in developing a diversified water portfolio to meet the City's water needs.

6. 2015 UWMP Appendix L

The information contained in this appendix is also intended to be a new Appendix L attached to the City's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). The City provided notice of the availability of the draft 2020 UWMP, 2020 WSCP, and a new Appendix L to the 2015 UWMP and the public hearing to consider adoption of the documents in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix L to the 2015 UWMP, and the 2020 WSCP were posted on the City's website, fresno.gov, on June 28, 2021, more than 14 days in advance of the public hearing on July 15, 2021. The notice of availability of the documents was sent to the City's customers, as well as cities and counties in the City's service area. Copies of the notification letter sent to the customers and cities and counties in the City's service area are included in the 2020 UWMP Appendix L. Thus, this Appendix D to the City's 2020 UWMP, which was adopted with the City's 2020 UWMP, will also be recognized and treated as Appendix L to the City's 2015 UWMP.

The City held the public hearing for the draft 2020 UWMP, draft Appendix L to the 2015 UWMP, and draft 2020 WSCP on July 15, 2021, at a regular City Council meeting, held online due to COVID-19 concerns. At the meeting, the City Council determined that the 2020 UWMP and the 2020 WSCP accurately represent the water resources plan for the City's service area. In addition, the City Council determined that Appendix L to the 2015 UWMP and Appendix D to the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions 2021-196, 2021-197, and 2021-198, the City Council adopted the 2020 UWMP, the 2020 WSCP, and Appendix L to the 2015 UWMP and authorized their submittal to the State of California. Copies of the resolutions are included in the 2020 UWMP Appendix M.

Table 1. Calculation of Service Area Water Demands without Water Use Efficiency (UWMP Table C-1 and Table C-2)

Table C-1: Optional Calculation of Water Use Efficiency -To be completed if Water Supplier does not specifically estimate Water Use Efficiency as a supply

Service Area Water Use Efficiency Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For	163,300	172,900	168,200	136,579	147,505	154,434	161,372	168,318
Non-Potable Water Demands	750	1,000	9,500	14,220	14,220	14,220	14,220	14,220
Potable Service Area Demands with Water Use Efficiency Accounted For	162,550	171,900	158,700	122,359	133,285	140,214	147,152	154,098

Total Service Area Population	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Population	505,315	525,575	550,217	609,433	674,677	719,327	765,278	812,529

Water Use Efficiency Since Baseline (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Per Capita Water Use (GPCD)	287	292	257	179	176	174	172	169
Change in Per Capita Water Use from Baseline (GPCD)		5	(30)	(108)	(111)	(113)	(116)	(118)
Estimated Water Use Efficiency Since Baseline		(2,833)	18,294	73,684	83,745	91,180	99,023	107,277

Table C-2: Calculation of Service Area Water Demands Without Water Use Efficiency

Total Service Area Water Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For	163,300	172,900	168,200	136,579	147,505	154,434	161,372	168,318
Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline	-	(2,833)	18,294	73,684	83,745	91,180	99,023	107,277
Service Area Water Demands without Water Use Efficiency Accounted For	163,300	170,067	186,494	210,263	231,250	245,614	260,395	275,595

Table 2. Calculation of Supplies Contributing to Regional Self-Reliance (UWMP Table C-3)

Table C-3: Calculation of Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Estimated Water Use Efficiency since Baseline	-	(2,833)	18,294	73,684	83,745	91,180	99,023	107,277
Water Recycling	750	1,000	9,500	14,220	14,220	14,220	14,220	14,220
Stormwater Capture and Use								
Advanced Water Technologies								
Conjunctive Use Projects								
Local and Regional Water Supply and Storage Projects	88,800	76,100	132,480	138,090	143,630	149,100	154,490	159,820
Other Programs and Projects the Contribute to Regional Self-Reliance	131,750	117,400	116,000	125,030	131,600	131,600	131,600	131,600
Water Supplies Contributing to Regional Self-Reliance	221,300	191,667	276,274	351,024	373,195	386,100	399,333	412,917

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	163,300	170,067	186,494	210,263	231,250	245,614	260,395	275,595

Change in Regional Self Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Water Supplies Contributing to Regional Self-Reliance	221,300	191,667	276,274	351,024	373,195	386,100	399,333	412,917
Change in Water Supplies Contributing to Regional Self-Reliance		(29,633)	54,974	129,724	151,895	164,800	178,033	191,617

Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Percent of Water Supplies Contributing to Regional Self-Reliance	135.5%	112.7%	148.1%	166.9%	161.4%	157.2%	153.4%	149.8%
Change in Percent of Water Supplies Contributing to Regional Self-Reliance		-22.8%	12.6%	31.4%	25.9%	21.7%	17.8%	14.3%

Table 3. Reliance on Water Supplies from the Delta Watershed (UWMP Table C-4)

Table C-4: Calculation of Reliance on Water Supplies from the Delta Watershed

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
CVP/SWP Contract Supplies	58,200	58,200	52,600	53,680	53,680	53,680	53,680	53,680
Delta/Delta Tributary Diversions								
Transfers and Exchanges of Supplies from the Delta Watershed								
Other Water Supplies from the Delta Watershed								
Total Water Supplies from the Delta Watershed	58,200	58,200	52,600	53,680	53,680	53,680	53,680	53,680

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	163,300	170,067	186,494	210,263	231,250	245,614	260,395	275,595

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Water Supplies from the Delta Watershed	58,200	58,200	52,600	53,680	53,680	53,680	53,680	53,680
Change in Water Supplies from the Delta Watershed		-	(5,600)	(4,520)	(4,520)	(4,520)	(4,520)	(4,520)

Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Percent of Water Supplies from the Delta Watershed	35.6%	34.2%	28.2%	25.5%	23.2%	21.9%	20.6%	19.5%
Change in Percent of Water Supplies from the Delta Watershed		-1.4%	-7.4%	-10.1%	-12.4%	-13.8%	-15.0%	-16.2%

E

AWWA Water Audits

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.

? Click to access definition

+ Click to add a comment

Water Audit Report for: City of Fresno (1010007)

Reporting Year: 2016 1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	112,398.020	acre-ft/yr	3			acre-ft/yr
Water imported:	n/a	0.000	acre-ft/yr				acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration

Enter positive % or value for over-registration

WATER SUPPLIED: 112,398.020 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option

			Pcnt:	Value:	
Billed metered:	9	103,038.468	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	10	42.876	acre-ft/yr			
Unbilled unmetered:	5	280.995	acre-ft/yr		280.995	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: ? 103,362.339 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 9,035.681 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		280.995	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	1,041.226	acre-ft/yr	1.00%	acre-ft/yr
Systematic data handling errors:		257.596	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 1,579.817 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 7,455.864 acre-ft/yr

WATER LOSSES: 9,035.681 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 9,359.552 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,810.39	miles	
Number of active AND inactive service connections:	9	143,916		
Service connection density:		79	conn./mile main	

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 3 50.0 psi

COST DATA

Total annual cost of operating water system:	10	$71,848,500	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.86	$/1000 gallons (US)	
Variable production cost (applied to Real Losses):	5	$152.10	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 66 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources

2: Customer metering inaccuracies

3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

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+ Click to add a comment

Water Audit Report for: City of Fresno
Reporting Year: 2017 (1/2017 - 12/2017)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

						Pcnt:	Value:	
Volume from own sources:	5	121,079.641	acre-ft/yr	5				acre-ft/yr
Water imported:	n/a	0.000	acre-ft/yr					acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr					acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 121,079.641 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	9	110,520.840	acre-ft/yr		
Billed unmetered:	n/a	0.000	acre-ft/yr		
Unbilled metered:	10	48.124	acre-ft/yr		
Unbilled unmetered:	5	276.052	acre-ft/yr		276.052 acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 110,845.016 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 10,234.625 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		302.699	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	1,116.858	acre-ft/yr	1.00%	acre-ft/yr
Systematic data handling errors:		276.302	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,695.859 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 8,538.766 acre-ft/yr

WATER LOSSES: 10,234.625 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 10,558.801 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,854.4	miles
Number of active AND inactive service connections:	9	146,212	
Service connection density:		79	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 4 — 50.0 psi

COST DATA

Total annual cost of operating water system:	10	$76,015,350	$/Year
Customer retail unit cost (applied to Apparent Losses):	9	$2.01	$/1000 gallons (US)
Variable production cost (applied to Real Losses):	5	$175.42	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 66 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

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? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Fresno
Reporting Year: 2018 | 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	120,065.780	acre-ft/yr	8			acre-ft/yr
Water imported:	n/a		acre-ft/yr				acre-ft/yr
Water exported:	n/a		acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 120,065.780 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	9	110,710.560 acre-ft/yr			
Billed unmetered:	n/a	0.000 acre-ft/yr			
Unbilled metered:	8	27.129 acre-ft/yr			
Unbilled unmetered:	5	300.164 acre-ft/yr		300.164	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 111,037.853 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 9,027.927 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		300.164 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	1,118.563 acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:		276.776 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,695.503 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 7,332.423 acre-ft/yr

WATER LOSSES: 9,027.927 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 9,355.220 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,854.7	miles
Number of active AND inactive service connections:	9	146,608	
Service connection density:		79	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 10 | 53.3 psi

COST DATA

Total annual cost of operating water system:	10	$82,960,821	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$2.33	$/1000 litres	
Variable production cost (applied to Real Losses):	5	$178.06	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 66 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software: Worksheet

FWAS v6.0

American Water Works Association.

Water Audit Report for: City of Fresno
Audit Year: 2019 | Jan 01 2019 - Dec 31 2019 | Calendar

Click 'n' to add notes
Click 'g' to determine data validity grade

To edit water system info: go to start page

To access definitions, click the input name

All volumes to be entered as: ACRE-FEET PER YEAR

WATER SUPPLIED

Water Supplied Error Adjustments — choose entry option:

VOS	Volume from Own Sources:	n	g	115,544.090	Acre-ft/Yr	n g	5.00%	percent	under-registration	VOSEA
WI	Water Imported:	n	g	0.000	Acre-ft/Yr					WIEA
WE	Water Exported:	n	g	0.000	Acre-ft/Yr					WEEA
	WATER SUPPLIED:			121,625.358	Acre-ft/Yr					

AUTHORIZED CONSUMPTION

BMAC	Billed Metered:	n	g		106,485.360	Acre-ft/Yr		
BUAC	Billed Unmetered:	n	g		0.000	Acre-ft/Yr		
UMAC	Unbilled Metered:	n	g		52.635	Acre-ft/Yr	choose entry option:	
UUAC	Unbilled Unmetered:	n	g	3	266.213	Acre-ft/Yr	0.25%	default

Default option selected for Unbilled Unmetered, with automatic data grading of 3

AUTHORIZED CONSUMPTION: 106,804.208 Acre-ft/Yr

WATER LOSSES

14,821.149 Acre-ft/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

SDHE	Systematic Data Handling Errors:	n	g	3	266.213	Acre-ft/Yr	choose entry option: 0.25%	default	
CMI	Customer Metering Inaccuracies:	n	g		1,076.141	Acre-ft/Yr	1.00%	percent	under-registration
UC	Unauthorized Consumption:	n	g	3	266.213	Acre-ft/Yr	0.25%	default	

Default option selected for Unauthorized Consumption, with automatic data grading of 3

Apparent Losses: 1,608.568 Acre-ft/Yr

Real Losses

Real Losses: 13,212.581 Acre-ft/Yr

WATER LOSSES: 14,821.149 Acre-ft/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 15,139.998 Acre-ft/Yr

SYSTEM DATA

Lm	Length of mains:	n	g	1,862.2	miles	(including fire hydrant lead lengths)
Nc	Number of service connections:	n	g	147,633		(active *and* inactive)
	Service connection density:			79	conn./mile main	

Are customer meters typically located at the curbstop/property line? Yes

Lp — n g 10

Average length of customer service line has been set to zero and a data grading of 10 has been applied

AOP — Average Operating Pressure: n g 50.0 psi

COST DATA

CRUC	Customer Retail Unit Charge:	n	g	$2.33	$/1000 gallons (US)	Total Annual Operating Cost	
VPC	Variable Production Cost:	n	g	$230.95	$/acre-ft	$106,528,917	$/yr (optional input)

WATER AUDIT DATA VALIDITY TIER:

Click 'g' for 10 parameter(s), then complete all visible data grading questions to enable the Data Validity Score to calculate

go to dashboard

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

Unit Total Losses:		gal/conn/day
Unit Apparent Losses:		gal/conn/day
Unit Real Losses[^]:		gal/conn/day
Unit Real Losses[¤]:		gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

F

DWR Population Tool Output

WUEdata - Fresno City Of

Sign Out

Please print this page to a PDF and include as part of your UWMP submittal.

Confirmation Information

Generated By	Water Supplier Name	Confirmation #	Generated On
Heather Freed	Fresno City Of	8103177726	3/17/2021 12:16:56 PM

Boundary Information

Census Year	Boundary Filename	Internal Boundary ID
1990	fresno_1990_processed.kml	517
2000	fresno_2000_processed.kml	516
2010	fresno_2010_processed.kml	515
1990	fresno_1990_processed.kml	517
2000	fresno_2000_processed.kml	516
2010	fresno_2010_processed.kml	515
1990	fresno_1990_processed.kml	517
2000	fresno_2000_processed.kml	516
2010	fresno_2010_processed.kml	515

Baseline Period Ranges

10 to 15-year baseline period

Number of years in baseline period:	10
Year beginning baseline period range:	1996
Year ending baseline period range[1]:	2005

5-year baseline period

Year beginning baseline period range:	2003
Year ending baseline period range[2]:	2007

[1] The ending year must be between December 31, 2004 and December 31, 2010.

[2] The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection

Year	Census Block Level Total Population	Number of Connections *	Persons per Connection
1990	**364,084**		**4.23**
1991	-	-	4.23
1992	-	-	4.24
1993	-	-	4.24
1994	-	-	4.25
1995	-	-	4.26
1996	-	-	4.26
1997	-	-	4.27
1998	-	-	4.27
1999	-	-	4.28
2000	**439,062**	**102476**	**4.28**
2001	-	-	4.29
2002	-	-	4.29
2003	-	-	4.30
2004	-	-	4.30
2005	-	-	4.31
2006	-	-	4.32
2007	-	-	4.32
2008	-	-	4.33
2009	-	-	4.33
2010	**505,315**	**116373**	**4.34**
2011	-	-	4.28
2012	-	-	4.28
2013	-	-	4.28
2014	-	-	4.28
2015	-	-	4.28
2020	**-**	**-**	**4.41 ****

Population Using Persons-Per-Connection

Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	1996		4.26	
Year 2	1997		4.27	
Year 3	1998		4.27	
Year 4	1999		4.28	
Year 5	2000	102476	4.28	**439,062**
Year 6	2001		4.29	
Year 7	2002		4.29	
Year 8	2003		4.30	
Year 9	2004		4.30	
Year 10	2005		4.31	
5 Year Baseline Population Calculations				
Year 1	2003		4.30	
Year 2	2004		4.30	
Year 3	2005		4.31	
Year 4	2006		4.32	
Year 5	2007		4.32	
2020 Compliance Year Population Calculations				
2020		124862	4.41 **	**550,217**

Hide Print Confirmation

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK

G

North Kings Subbasin Groundwater Sustainability Plan

Reference the North Kings Subbasin Groundwater Sustainability Plan online: https://www.northkingsgsa.org/groundwater-sustainability-plan/

H

City of Fresno's Central Valley Project Contract

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES
AND
CITY OF FRESNO
PROVIDING FOR PROJECT WATER SERVICE
FROM FRIANT DIVISION

THIS CONTRACT, made this 18 day of August, 2005, in pursuance generally of the Act of June 17, 1902 (32 Stat. 388), and acts amendatory or supplementary thereto, including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented, July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706), all collectively hereinafter referred to as Federal Reclamation law, between the UNITED STATES OF AMERICA, hereinafter referred to as the United States, and the CITY OF FRESNO, hereinafter referred to as the Contractor, a public agency of the State of California, duly organized, existing, and acting pursuant to the laws thereof;

WITNESSETH, That:

EXPLANATORY RECITALS

[1st] WHEREAS, the United States has constructed and is operating the Central Valley Project (Project), California, for diversion, storage, carriage, distribution and beneficial use, for flood control, irrigation, municipal, domestic, industrial, fish and wildlife mitigation, protection and restoration, generation and distribution of electric energy, salinity control, navigation and other beneficial uses, of waters of the Sacramento River, the American River, the Trinity River, and the San Joaquin River and their tributaries; and

[2nd] WHEREAS, the United States constructed Friant Dam (thereby creating Millerton Lake) and the Friant-Kern and Madera Canals, hereinafter collectively referred to as the Friant Division facilities, which will be used in part for the furnishing of water to the Contractor pursuant to the terms of this Contract; and

[3rd] WHEREAS, pursuant to Section 8 of the Act of June 17, 1902 (32 Stat. 388), the United States has acquired water rights and other rights to the flows of the San Joaquin River, including without limitation the permits issued as the result of Decision 935 by the California State Water Resources Control Board and the contracts described in subdivision (n) of Article 3 of this Contract, pursuant to which the Contracting Officer develops, diverts, stores and delivers Project Water stored or flowing through Millerton Lake in accordance with State and Federal law for the benefit of Project Contractors in the Friant Division; and

[3.1] WHEREAS, the water supplied to the Contractor pursuant to this Contract is Project Water developed through the exercise of the rights described in the third Explanatory Recital of this Contract; and

[4th] WHEREAS, the Contractor and the United States entered into Contract No. 14-06-200-8901, which established terms for the delivery to the Contractor of Project Water from the Friant Division from March 1, 1966, to February 28, 2006, hereinafter referred to as the Existing Contract; and

[5th] WHEREAS, the Contractor and the United States have, pursuant to Subsection 3404(c)(3) of the Central Valley Project Improvement Act (CVPIA), subsequently entered into a Binding Agreement identified as Binding Agreement No. 14-06-200-8901-BA, which sets out the terms pursuant to which the Contractor agreed to renew the Existing Contract before its expiration date after completion of the programmatic environmental impact statement and other appropriate environmental documentation and negotiation of a renewal contract, and which also sets out the consequences of a subsequent decision not to renew; and

[6th] WHEREAS, Section 3404(c) of the CVPIA provides for long-term renewal of the Existing Contract following completion of appropriate environmental documentation, including a programmatic environmental impact statement (PEIS) pursuant to the National Environmental Policy Act (NEPA) analyzing the direct and indirect impacts and benefits of implementing the CVPIA and the potential renewal of all existing contracts for Project Water; and

[7th] WHEREAS, the United States has completed the PEIS and all other appropriate environmental review necessary to provide for long-term renewal of the Existing Contract; and

[8th] WHEREAS, the Contractor has requested the long-term renewal of the Existing Contract, pursuant to the terms of the Existing Contract, Federal Reclamation law, and the laws of the State of California, for water service from the Project; and

[9th] WHEREAS, the United States has determined that the Contractor has fulfilled all of its obligations under the Existing Contract; and

[10th] WHEREAS, the Contractor has demonstrated to the satisfaction of the Contracting Officer that the Contractor has utilized the Project Water supplies available to it for reasonable and beneficial use and/or has demonstrated projected future demand for water use such that the Contractor has the capability and expects to utilize fully for reasonable and beneficial use the quantity of Project Water to be made available to it pursuant to this Contract; and

[11th] WHEREAS, water obtained from the Project has been relied upon by urban and agricultural areas within California for more than 50 years, and is considered by the Contractor as an essential portion of its water supply; and

[12th] WHEREAS, the economies of regions within the Project, including the Contractor's, depend upon the continued availability of water, including water service from the Project; and

[13th] WHEREAS, the Secretary intends through coordination, cooperation, and partnerships to pursue measures to improve water supply, water quality, and reliability of the Project for all Project purposes; and

[14th] WHEREAS, the mutual goals of the United States and the Contractor include: to provide for reliable Project Water supplies; to control costs of those supplies; to achieve repayment of the Project as required by law; to guard reasonably against Project Water shortages; to achieve a reasonable balance among competing demands for use of Project Water; and to comply with all applicable environmental statutes, all consistent with the legal obligations of the United States relative to the Project; and

[15th] WHEREAS, the parties intend by this Contract to develop a more cooperative relationship in order to achieve their mutual goals; and

[15.1] WHEREAS, during uncontrolled seasons, Friant Division Project Contractors utilize undependable Class 2 Water in their service areas to, among other things, assist in the management and alleviation of groundwater overdraft in the Friant Division service area, provide opportunities for environmental enhancement, including restoration of the San Joaquin River below Friant Dam, minimize flooding along the San Joaquin River, encourage optimal water management, and maximize the reasonable and beneficial use of the water; and

[15.2] WHEREAS, the parties desire and intend that this Contract not provide a disincentive to the Friant Division Project Contractors continuing to carry out the beneficial activities set out in the Explanatory Recital immediately above; and

[16th] WHEREAS, the United States and the Contractor are willing to enter into this Contract pursuant to Federal Reclamation law on the terms and conditions set forth below;

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, it is hereby mutually agreed by the parties hereto as follows:

DEFINITIONS

1. When used herein unless otherwise distinctly expressed, or manifestly incompatible with the intent of the parties as expressed in this Contract, the term:

(a) "Calendar Year" shall mean the period January 1 through December 31, both dates inclusive;

(b) "Charges" shall mean the payments required by Federal Reclamation law in addition to the Rates and Tiered Pricing Component specified in this Contract as determined annually by the Contracting Officer pursuant to this Contract;

(b2) "Class 1 Water" shall mean that supply of water stored in or flowing through Millerton Lake which, subject to the contingencies hereinafter described in Articles 3, 11, and 12 of this Contract, will be available for delivery from Millerton Lake and the Friant-Kern and Madera Canals as a dependable water supply during each Year;

(b3) "Class 2 Water" shall mean that supply of water which can be made available subject to the contingencies hereinafter described in Articles 3, 11, and 12 of this Contract for delivery from Millerton Lake and the Friant-Kern and Madera Canals in addition to the supply of Class 1 Water. Because of its uncertainty as to availability and time of occurrence, such water will be undependable in character and will be furnished only if, as, and when it can be made available as determined by the Contracting Officer;

(c) "Condition of Shortage" shall mean a condition respecting the Project during any Year such that the Contracting Officer is unable to deliver sufficient water to meet the Contract Total;

(d) "Contracting Officer" shall mean the Secretary of the Interior's duly authorized representative acting pursuant to this Contract or applicable Federal Reclamation law or regulation;

(e) "Contract Total" shall mean the maximum amount of Class 1 Water, plus the maximum amount of Class 2 Water to which the Contractor is entitled under subdivision (a) of Article 3 of this Contract;

(f) "Contractor's Service Area" shall mean the area to which the Contractor is permitted to provide Project Water under this Contract as described in Exhibit "A" attached hereto, which may be modified from time to time in accordance with Article 35 of this Contract without amendment of this Contract;

(g) "CVPIA" shall mean the Central Valley Project Improvement Act, Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

(h-i) Omitted;

(j) "Full Cost Rate" shall mean an annual rate as determined by the Contracting Officer that shall amortize the expenditures for construction properly allocable to the Project irrigation or M&I functions, as appropriate, of facilities in service including all O&M deficits funded, less payments, over such periods as may be required under Federal Reclamation law or applicable contract provisions. Interest will accrue on both the construction expenditures and funded O&M deficits from October 12, 1982, on costs outstanding at that date, or from the date incurred in the case of costs arising subsequent to October 12, 1982, and shall be calculated in accordance with subsections 202(3)(B) and (3)(C) of the RRA. The Full Cost Rate includes actual operation, maintenance, and replacement costs consistent with Section 426.2 of the Rules and Regulations for the RRA;

(k-l) Omitted;

(m) "Irrigation Water" shall mean water made available from the Project that is used primarily in the production of agricultural crops or livestock, including domestic use incidental thereto, and watering of livestock;

(n) Omitted;

(n2) "Long Term Historic Average" shall mean the average of the final forecast of Water Made Available to the Contractor pursuant to this Contract and the contract referenced in the fourth Explanatory Recital of this Contract;

(o) "Municipal and Industrial (M&I) Water" shall mean Project Water, other than Irrigation Water, made available to the Contractor. M&I Water shall include water used for human use and purposes such as the watering of landscaping or pasture for animals (e.g., horses) which are kept for personal enjoyment or water delivered to land holdings operated in units of less than five acres unless the Contractor establishes to the satisfaction of the Contracting Officer that the use of water delivered to any such landholding is a use described in subdivision (m) of this Article;

(p) "M&I Full Cost Water Rate" shall mean the Full Cost Rate applicable to the delivery of M&I Water;

(q) "Operation and Maintenance" or "O&M" shall mean normal and reasonable care, control, operation, repair, replacement (other than capital replacement), and maintenance of Project facilities;

(r) "Operating Non-Federal Entity" shall mean the Friant Water Authority, its successors or assigns, a non-Federal entity which has the obligation to operate and maintain all or a portion of the Friant Division facilities pursuant to an agreement with the United States, and which may have funding obligations with respect thereto;

(s) "Project" shall mean the Central Valley Project owned by the United States and managed by the Department of the Interior, Bureau of Reclamation;

(t) "Project Contractors" shall mean all parties who have water service contracts for Project Water from the Project with the United States pursuant to Federal Reclamation law;

(u) "Project Water" shall mean all water that is developed, diverted, stored, or delivered by the Secretary in accordance with the statutes authorizing the Project and in accordance with the terms and conditions of water rights acquired pursuant to California law;

(v) "Rates" shall mean the payments determined annually by the Contracting Officer in accordance with the then-current applicable water ratesetting policies for the Project, as described in subdivision (a) of Article 7 of this Contract;

(w) Omitted;

(x) "Secretary" shall mean the Secretary of the Interior, a duly appointed successor, or an authorized representative acting pursuant to any authority of the Secretary and through any agency of the Department of the Interior;

(y) "Tiered Pricing Component" shall be the incremental amount to be paid for each acre-foot of Water Delivered as described in subdivision (j) of Article 7 of this Contract;

(z) "Water Delivered" or "Delivered Water" shall mean Project Water diverted for use by the Contractor at the point(s) of delivery approved by the Contracting Officer;

(aa) "Water Made Available" shall mean the estimated amount of Project Water that can be delivered to the Contractor for the upcoming Year as declared by the Contracting Officer, pursuant to subdivision (a) of Article 4 of this Contract;

(bb) "Water Scheduled" shall mean Project Water made available to the Contractor for which times and quantities for delivery have been established by the Contractor and Contracting Officer, pursuant to subdivision (b) of Article 4 of this Contract; and

(cc) "Year" shall mean the period from and including March 1 of each Calendar Year through the last day of February of the following Calendar Year.

TERM OF CONTRACT

2. (a) This Contract supersedes the Existing Contract and shall be effective on the date first hereinabove written through February 28, 2045. In the event the Contractor wishes to renew this Contract beyond February 28, 2045, the Contractor shall submit a request for renewal in writing to the Contracting Officer no later than two years prior to the date this Contract expires.

(b) Omitted.

(c) Provided the Contractor is complying with all terms and conditions of this Contract and all legal obligations of the Contractor, if any, set forth in an enforceable court order, final judgment and/or settlement relating to restoration of the San Joaquin River, this Contract shall be renewed for successive periods of up to 40 years each, which periods shall be consistent with the then-existing Reclamation-wide policy, under terms and conditions mutually agreeable to the parties and consistent with Federal and State law. The Contractor shall be afforded the opportunity to comment to the Contracting Officer on the proposed adoption and application of any revised policy applicable to the delivery of M&I Water that would limit the term of any subsequent renewal contract with the Contractor for the furnishing of M&I Water to less than 40 years.

(d) The Contracting Officer shall make a determination ten years after the date of execution of this Contract, and every five years thereafter during the term of this Contract, of whether a conversion to a contract under subsection 9(c)(1) of the Reclamation Project Act of 1939 can be accomplished. The Contracting Officer anticipates that during the term of this Contract, all authorized Project construction expected to occur will have occurred, and on that basis the Contracting Officer agrees upon such completion to allocate all costs that are properly assignable to the Contractor, and agrees further that, at any time after such allocation is made, and subject to satisfaction of the conditions set out in this subdivision, this Contract shall, at the request of the Contractor, be converted to a contract under subsection 9(c)(1) of the Reclamation Project Act of 1939, subject to applicable Federal law and under stated terms and conditions mutually agreeable to the Contractor and the Contracting Officer. A condition for such conversion to occur shall be a determination by the Contracting Officer that, account being taken of the amount credited to return by the Contractor as provided for under Federal Reclamation law, the remaining amount of construction costs assignable for ultimate return by the Contractor can probably be repaid to the United States within the term of a contract under subsection 9(c)(1). If the remaining amount of costs that are properly assignable to the Contractor cannot be determined during the term of this Contract, the Contracting Officer shall notify the Contractor, and provide the reason(s) why such a determination could not be made. Further, the Contracting Officer shall make such a determination as soon thereafter as possible so as to permit, upon request of the Contractor and satisfaction of the conditions set out above, conversion to a contract under subsection 9(c)(1). In the event such determination of costs has not been made at a time which allows conversion of this Contract during the term of this

Contract or the Contractor has not requested conversion of this Contract within such term, the parties shall incorporate in any subsequent renewal contract as described in subdivision (c) of this Article a provision that carries forth in substantially identical terms the provisions of this subdivision.

WATER TO BE MADE AVAILABLE AND DELIVERED TO THE CONTRACTOR

3. (a) During each Year, consistent with all applicable State water rights, permits, and licenses, Federal law, and subject to the provisions set forth in Articles 11 and 12 of this Contract, the Contracting Officer shall make available for delivery to the Contractor 60,000 acre-feet of Class 1 Water for M&I purposes. Water Delivered to the Contractor in accordance with this subdivision shall be scheduled and paid for pursuant to the provisions of Articles 4 and 7 of this Contract.

(b) Omitted.

(c) The Contractor shall utilize the Project Water in accordance with all applicable legal requirements.

(d) The Contractor shall make reasonable and beneficial use of all water furnished pursuant to this Contract. Groundwater recharge programs (direct, indirect, or in lieu), groundwater banking programs, surface water storage programs, and other similar programs utilizing Project Water or other water furnished pursuant to this Contract conducted within the Contractor's Service Area which are consistent with applicable State law and result in use consistent with Federal Reclamation law will be allowed: Provided, That any direct recharge program(s) is (are) described in the Contractor's water conservation plan submitted pursuant to Article 26 of this Contract: Provided further, That such water conservation plan demonstrates sufficient lawful uses exist in the

Contractor's Service Area so that using a long-term average, the quantity of Delivered Water is demonstrated to be reasonable for such uses and in compliance with Federal Reclamation law. Groundwater recharge programs, groundwater banking programs, surface water storage programs, and other similar programs utilizing Project Water or other water furnished pursuant to this Contract conducted outside the Contractor's Service Area may be permitted upon written approval of the Contracting Officer, which approval will be based upon environmental documentation, Project Water rights, and Project operational concerns. The Contracting Officer will address such concerns in regulations, policies, or guidelines.

(e) The Contractor shall comply with requirements applicable to the Contractor in biological opinion(s) prepared as a result of a consultation regarding the execution of this Contract undertaken pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, that are within the Contractor's legal authority to implement. The Existing Contract, which evidences in excess of 39 years of diversions for M&I purposes of the quantities of water provided in subdivision (a) of Article 3 of this Contract, will be considered in developing an appropriate baseline for the biological assessment(s) prepared pursuant to the ESA, and any other needed environmental review. Nothing herein shall be construed to prevent the Contractor from challenging or seeking judicial relief in a court of competent jurisdiction with respect to any biological opinion or other environmental documentation referred to in this Article.

(f) Subject to subdivisions (l) and (n) of Article 3 of this Contract, following the declaration of Water Made Available under Article 4 of this Contract, the Contracting Officer will make a determination whether Project Water, or other water available to the Project, can be made

available to the Contractor in addition to the Contract Total under Article 3 of this Contract during the Year without adversely impacting other Project Contractors. At the request of the Contractor, the Contracting Officer will consult with the Contractor prior to making such a determination. Subject to subdivisions (l) and (n) of Article 3 of this Contract, if the Contracting Officer determines that Project Water, or other water available to the Project, can be made available to the Contractor, the Contracting Officer will announce the availability of such water and shall so notify the Contractor as soon as practicable. The Contracting Officer will thereafter meet with the Contractor and other Project Contractors capable of taking such water to determine the most equitable and efficient allocation of such water. If the Contractor requests the delivery of any quantity of such water, the Contracting Officer shall make such water available to the Contractor in accordance with applicable statutes, regulations, guidelines, and policies.

(g) The Contractor may request permission to reschedule for use during the subsequent Year some or all of the Water Made Available to the Contractor during the current Year referred to as "carryover." The Contractor may request permission to use during the current Year a quantity of Project Water which may be made available by the United States to the Contractor during the subsequent Year referred to as "preuse." The Contracting Officer's written approval may permit such uses in accordance with applicable statutes, regulations, guidelines, and policies.

(h) The Contractor's right pursuant to Federal Reclamation law and applicable State law to the reasonable and beneficial use of Water Delivered pursuant to this Contract during the term thereof and any subsequent renewal contracts, as described in Article 2 of this Contract, during the terms thereof shall not be disturbed so long as the Contractor shall fulfill all of its obligations

under this Contract and any renewals thereof. Nothing in the preceding sentence shall affect the Contracting Officer's ability to impose shortages under Article 11 or subdivision (b) of Article 12 of this Contract or applicable provisions of any subsequent renewal contracts.

(i) Project Water furnished to the Contractor pursuant to this Contract may be delivered for other than M&I purposes upon written approval by the Contracting Officer in accordance with the terms and conditions of such approval.

(j) The Contracting Officer shall make reasonable efforts to protect the water rights and other rights described in the third Explanatory Recital of this Contract necessary for the Project and to provide the water available under this Contract. The Contracting Officer shall not object to participation by the Contractor, in the capacity and to the extent permitted by law, in administrative proceedings related to the water rights and other rights described in the third Explanatory Recital of this Contract: Provided, That the Contracting Officer retains the right to object to the substance of the Contractor's position in such a proceeding: Provided further, That in such proceedings the Contracting Officer shall recognize the Contractor has a legal right under the terms of this Contract to use Project Water.

(k) Project Water furnished to the Contractor during any month designated in a schedule or revised schedule submitted by the Contractor and approved by the Contracting Officer shall be deemed to have been accepted by the Contractor as Class 1 Water to the extent that Class 1 Water is called for in such schedule for such month and shall be deemed to have been accepted as Class 2 Water to the extent Class 2 Water is called for in such schedule for such month. If in any month the Contractor diverts a quantity of water in addition to the total amount of Class 1 Water and

Class 2 Water set forth in the Contractor's approved schedule or revised schedule for such month, such additional diversions shall be charged first against the Contractor's remaining Class 2 Water supply available in the current Year. To the extent the Contractor's remaining Class 2 Water supply available in the current Year is not sufficient to account for such additional diversions, such additional diversions shall be charged against the Contractor's remaining Class 1 Water supply available in the current Year. To the extent the Contractor's remaining Class 1 Water and Class 2 Water supplies available in the current Year are not sufficient to account for such additional diversions, such additional diversions shall be charged first against the Contractor's available Class 2 Water supply and then against the Contractor's available Class 1 Water supply, both for the following Year. Payment for all additional diversions of water shall be made in accordance with Article 7 of this Contract.

(l) If the Contracting Officer determines there is a Project Water supply available at Friant Dam as the result of an unusually large water supply not otherwise storable for Project purposes or infrequent and otherwise unmanaged flood flows of short duration, such water will be made available to the Contractor and others under Section 215 of the RRA pursuant to the priorities specified below if the Contractor enters into a temporary contract with the United States not to exceed one year for the delivery of such water or, as otherwise provided for in Federal Reclamation law and associated regulations. Such water may be identified by the Contractor either (i) as additional water to supplement the supply of Class 1 Water and/or Class 2 Water made available to it pursuant to this Contract or, (ii) upon written notification to the Contracting Officer, as water to be credited against the Contractor's Class 2 Water supply available pursuant to this Contract. The Contracting Officer

shall make water determined to be available pursuant to this subsection according to the following priorities: first, to long-term contractors for Class 1 Water and/or Class 2 Water within the Friant Division; second, to long-term contractors in the Cross Valley Division of the Project. The Contracting Officer will consider and seek to accommodate requests from other parties for Section 215 Water for use within the area identified as the Friant Division service area in the environmental assessment developed in connection with the execution of this Contract.

(m) Nothing in this Contract, nor any action or inaction of the Contractor or Contracting Officer in connection with the implementation of this Contract, is intended to override, modify, supersede, or otherwise interfere with any term or condition of the water rights and other rights referred in the third Explanatory Recital of this Contract.

(n) The rights of the Contractor under this Contract are subject to the terms of the contract for exchange waters, dated July 27, 1939, between the United States and the San Joaquin and Kings River Canal and Irrigation Company, Incorporated, et al., (hereinafter referred to as the Exchange Contractors), Contract No. I1r-1144, as amended. The United States agrees that it will not deliver to the Exchange Contractors thereunder waters of the San Joaquin River unless and until required by the terms of said contract, and the United States further agrees that it will not voluntarily and knowingly determine itself unable to deliver to the Exchange Contractors entitled thereto from water that is available or that may become available to it from the Sacramento River and its tributaries or the Sacramento-San Joaquin Delta those quantities required to satisfy the obligations of the United States under said Exchange Contract and under Schedule 2 of the Contract for Purchase of Miller and Lux Water Rights (Contract No. I1r-1145, dated July 27, 1939).

TIME FOR DELIVERY OF WATER

4. (a) On or about February 20 of each Calendar Year, the Contracting Officer shall announce the Contracting Officer's expected declaration of the Water Made Available. Such declaration will be expressed in terms of both Water Made Available and the Long Term Historic Average and will be updated monthly, and more frequently if necessary, based on then-current operational and hydrologic conditions and a new declaration with changes, if any, to the Water Made Available will be made. The Contracting Officer shall provide forecasts of Project operations and the basis of the estimate, with relevant supporting information, upon the written request of the Contractor. Concurrently with the declaration of the Water Made Available, the Contracting Officer shall provide the Contractor with the updated Long-Term Historic Average.

(b) On or before each March 1 and at such other times as necessary, the Contractor shall submit to the Contracting Officer a written schedule, satisfactory to the Contracting Officer, showing the monthly quantities of Project Water to be delivered by the United States to the Contractor pursuant to this Contract for the Year commencing on such March 1. The Contracting Officer shall use all reasonable means to deliver Project Water according to the approved schedule for the Year commencing on such March 1.

(c) The Contractor shall not schedule Project Water in excess of the quantity of Project Water the Contractor intends to put to reasonable and beneficial use within the Contractor's Service Area or to sell, transfer, or exchange pursuant to Article 9 of this Contract during any Year.

(d) Subject to the conditions set forth in subdivision (a) of Article 3 of this Contract, the United States shall deliver Project Water to the Contractor in accordance with the initial

schedule submitted by the Contractor pursuant to subdivision (b) of this Article, or any written revision(s), satisfactory to the Contracting Officer, thereto submitted within a reasonable time prior to the date(s) on which the requested change(s) is/are to be implemented: Provided, That the total amount of water requested in that schedule or revision does not exceed the quantities announced by the Contracting Officer pursuant to the provisions of subdivision (a) of Article 3, and the Contracting Officer determines that there will be sufficient capacity available in the appropriate Friant Division facilities to deliver the water in accordance with that schedule: Provided further, That the Contractor shall not schedule the delivery of any water during any period as to which the Contractor is notified by the Contracting Officer or Operating Non-Federal Entity that Project facilities required to make deliveries to the Contractor will not be in operation because of scheduled O&M.

(e) The Contractor may, during the period from and including November 1 of each Year through and including the last day of February of that Year, request delivery of any amount of the Class 1 Water estimated by the Contracting Officer to be made available to it during the following Year. The Contractor may, during the period from and including January 1 of each Year (or such earlier date as may be determined by the Contracting Officer) through and including the last day of February of that Year, request delivery of any amount of Class 2 Water estimated by the Contracting Officer to be made available to it during the following Year. Such water shall hereinafter be referred to as preuse water. Such request must be submitted in writing by the Contractor for a specified quantity of preuse water and shall be subject to the approval of the Contracting Officer. Payment for preuse water so requested shall be at the appropriate rate(s) for the following Year in accordance with Article 7 of this Contract and shall be made in advance of delivery of any preuse water. The

Contracting Officer shall deliver such preuse water in accordance with a schedule or any revision thereof submitted by the Contractor and approved by the Contracting Officer, to the extent such water is available and to the extent such deliveries will not interfere with the delivery of Project Water entitlements to other Friant Division contractors or the physical maintenance of the Project facilities. The quantities of preuse water delivered pursuant to this subdivision shall be deducted from the quantities of water that the Contracting Officer would otherwise be obligated to make available to the Contractor during the following Year: Provided, That the quantity of preuse water to be deducted from the quantities of either Class 1 Water or Class 2 Water to be made available to the Contractor in the following Year shall be specified by the Contractor at the time the preuse water is requested or as revised in its first schedule for the following Year submitted in accordance with subdivision (b) of this Article, based on the availability of the following Year water supplies as determined by the Contracting Officer.

POINT OF DIVERSION AND RESPONSIBILITY FOR DISTRIBUTION OF WATER

5. (a) Project Water scheduled pursuant to subdivision (b) of Article 4 of this Contract shall be delivered to the Contractor at a point or points of delivery either on Project facilities or another location or locations mutually agreed to in writing by the Contracting Officer and the Contractor.

(b) The Contracting Officer, either directly or through its written agreement(s) with the Operating Non-Federal Entity, shall make all reasonable efforts to maintain sufficient flows and levels of water in the Friant-Kern Canal to deliver Project Water to the Contractor at specific turnouts established pursuant to subdivision (a) of this Article.

(c) The Contractor shall not deliver Project Water to land outside the Contractor's Service Area unless approved in advance by the Contracting Officer.

(d) All Water Delivered to the Contractor pursuant to this Contract shall be measured and recorded with equipment furnished, installed, operated, and maintained by the United States or the Operating Non-Federal Entity at the point or points of delivery established pursuant to subdivision (a) of this Article. Upon the request of either party to this Contract, the Contracting Officer shall investigate, or cause to be investigated by the appropriate Operating Non-Federal Entity, the accuracy of such measurements and shall take any necessary steps to adjust any errors appearing therein. For any period of time when accurate measurements have not been made, the Contracting Officer shall consult with the Contractor and the responsible Operating Non-Federal Entity prior to making a final determination of the quantity delivered for that period of time.

(e) Neither the Contracting Officer nor any Operating Non-Federal Entity shall be responsible for the control, carriage, handling, use, disposal, or distribution of Water Delivered to the Contractor pursuant to this Contract beyond the delivery points specified in subdivision (a) of this Article. The Contractor shall indemnify the United States, its officers, employees, agents, and assigns on account of damage or claim of damage of any nature whatsoever for which there is legal responsibility, including property damage, personal injury, or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such Project Water Delivered beyond such delivery points, except for any damage or claim arising out of: (i) acts or omissions of the Contracting Officer or any of its officers, employees, agents, or assigns, including the Operating Non-Federal Entity, with the intent of creating the situation resulting in any damage or claim;

(ii) willful misconduct of the Contracting Officer or any of its officers, employees, agents, or assigns, including the Operating Non-Federal Entity; (iii) negligence of the Contracting Officer or any of its officers, employees, agents, or assigns including the Operating Non-Federal Entity; or (iv) damage or claims resulting from a malfunction of facilities owned and/or operated by the United States or responsible Operating Non-Federal Entity.

MEASUREMENT OF WATER WITHIN THE CONTRACTOR'S SERVICE AREA

6. (a) Within five years of the date of Contract execution, the Contractor will have an established measuring program satisfactory to the Contracting Officer. The Contractor shall ensure that all surface water delivered for M&I purposes is measured at each M&I service connection. The water measuring devices or water measuring methods of comparable effectiveness must be acceptable to the Contracting Officer. The Contractor shall be responsible for installing, operating, and maintaining and repairing all such measuring devices and implementing all such water measuring methods at no cost to the United States. The Contracting Officer acknowledges that the Contractor has a metering plan (Exhibit "C") setting forth the milestones and schedule that the Contractor will implement to comply with the requirements of this Article. Beginning January 2006, the Contractor shall provide an annual written report to the Contracting Officer describing the Contractor's metering plan implementation progress. The Contractor shall use the information obtained from such water measuring devices or water measuring methods to ensure its proper management of the water, to bill water users for water delivered by the Contractor; and, if applicable, to record water delivered for M&I purposes by customer class as defined in the Contractor's water conservation plan provided for in Article 26 of this Contract. Nothing herein contained, however, shall preclude the Contractor from

establishing and collecting any charges, assessments, or other revenues authorized by California law. The Contractor shall include a summary of all its annual surface water deliveries in the annual report described in subdivision (c) of Article 26.

(b) To the extent the information has not otherwise been provided, upon execution of this Contract, the Contractor shall provide to the Contracting Officer a written report describing the measurement devices or water measuring methods being used or to be used to implement subdivision (a) of this Article and identifying the M&I service connections or alternative measurement programs approved by the Contracting Officer, at which such measurement devices or water measuring methods are being used, and, if applicable, identifying the locations at which such devices and/or methods are not yet being used including a time schedule for implementation at such locations. The Contracting Officer shall advise the Contractor in writing within 60 days as to the adequacy, and necessary modifications, if any, of the measuring devices or water measuring methods identified in the Contractor's report and if the Contracting Officer does not respond in such time, they shall be deemed adequate. If the Contracting Officer notifies the Contractor that the measuring devices or methods are inadequate, the parties shall within 60 days following the Contracting Officer's response, negotiate in good faith the earliest practicable date by which the Contractor shall modify said measuring devices and/or measuring methods as required by the Contracting Officer to ensure compliance with subdivision (a) of this Article.

(c) All new surface water delivery systems installed within the Contractor's Service Area after the effective date of this Contract shall also comply with the measurement provisions described in subdivision (a) of this Article.

(d) The Contractor shall inform the Contracting Officer and the State of California in writing by April 30 of each Year of the monthly volume of surface water delivered within the Contractor's Service Area during the previous Year.

(e) The Contractor shall inform the Contracting Officer and the Operating Non-Federal Entity on or before the 20th calendar day of each month of the quantity of M&I Water taken during the preceding month.

(f) In the event the provisions of subdivision (a) of this Article or any portion thereof, are challenged in a judicial proceeding, the parties agree to meet and confer promptly and as often as necessary to employ their reasonable best efforts to coordinate their response to the challenge and, as appropriate, develop revisions to this Contract.

RATES AND METHOD OF PAYMENT FOR WATER

7. (a) The Contractor shall pay the United States as provided in this Article for all Delivered Water at Rates, Charges, and the Tiered Pricing Component established in accordance with (i) the Secretary's then-existing ratesetting policy for M&I Water. Such ratesetting policies shall be amended, modified, or superseded only through a public notice and comment procedure; (ii) applicable Federal Reclamation law and associated rules and regulations, or policies; and (iii) other applicable provisions of this Contract. Payments shall be made by cash transaction, electronic funds transfer, or any other mechanism as may be agreed to in writing by the Contractor and the Contracting Officer. The Rates, Charges, and Tiered Pricing Component applicable to the Contractor upon execution of this Contract are set forth in Exhibit "B", as may be revised annually.

(b) The Contracting Officer shall notify the Contractor of the Rates, Charges, and Tiered Pricing Component as follows:

(1) Prior to July 1 of each Calendar Year, the Contracting Officer shall provide the Contractor an estimate of the Charges for Project Water that will be applied to the period October 1, of the current Calendar Year, through September 30, of the following Calendar Year, and the basis for such estimate. The Contractor shall be allowed not less than two months to review and comment on such estimates. On or before September 15 of each Calendar Year, the Contracting Officer shall notify the Contractor in writing of the Charges to be in effect during the period October 1 of the current Calendar Year, through September 30, of the following Calendar Year, and such notification shall revise Exhibit "B."

(2) Prior to October 1 of each Calendar Year, the Contracting Officer shall make available to the Contractor an estimate of the Rates and Tiered Pricing Component for Project Water for the following Year and the computations and cost allocations upon which those Rates are based. The Contractor shall be allowed not less than two months to review and comment on such computations and cost allocations. By December 31 of each Calendar Year, the Contracting Officer shall provide the Contractor with the final Rates and Tiered Pricing Component to be in effect for the upcoming Year, and such notification shall revise Exhibit "B."

(c) At the time the Contractor submits the initial schedule for the delivery of Project Water for each Year pursuant to subdivision (b) of Article 4 of this Contract, the Contractor shall make an advance payment to the United States equal to the total amount payable pursuant to the applicable Rate(s) set under subdivision (a) of this Article, for the Project Water scheduled to be

delivered pursuant to this Contract during the first two calendar months of the Year. Before the end of the first month and before the end of each calendar month thereafter, the Contractor shall make an advance payment to the United States, at the Rate(s) set under subdivision (a) of this Article, for the Water Scheduled to be delivered pursuant to this Contract during the second month immediately following. Adjustments between advance payments for Water Scheduled and payments at Rates due for Water Delivered shall be made before the end of the following month: Provided, That any revised schedule submitted by the Contractor pursuant to Article 4 of this Contract which increases the amount of Water Delivered pursuant to this Contract during any month shall be accompanied with appropriate advance payment, at the Rates then in effect, to assure that Project Water is not delivered to the Contractor in advance of such payment. In any month in which the quantity of Water Delivered to the Contractor pursuant to this Contract equals the quantity of Water Scheduled and paid for by the Contractor, no additional Project Water shall be delivered to the Contractor unless and until an advance payment at the Rates then in effect for such additional Project Water is made. Final adjustment between the advance payments for the Water Scheduled and payments for the quantities of Water Delivered during each Year pursuant to this Contract shall be made as soon as practicable but no later than April 30th of the following Year, or 60 days after the delivery of Project Water carried over under subdivision (g) of Article 3 of this Contract if such water is not delivered by the last day of February.

(d) The Contractor shall also make a payment in addition to the Rate(s) in subdivision (c) of this Article to the United States for Water Delivered, at the Charges and the appropriate Tiered Pricing Component then in effect, before the end of the month following the

month of delivery. The payments shall be consistent with the quantities of M&I Water Delivered as shown in the water delivery report for the subject month prepared by the Operating Non-Federal Entity or, if there is no Operating Non-Federal Entity, by the Contracting Officer. Such water delivery report shall be the basis for payment of Charges and Tiered Pricing Component by the Contractor, and shall be provided to the Contractor by the Operating Non-Federal Entity or the Contracting Officer (as applicable) within five days after the end of the month of delivery. The water delivery report shall be deemed a bill for the payment of Charges and the applicable Tiered Pricing Component for Water Delivered. Adjustment for overpayment or underpayment of Charges shall be made through the adjustment of payments due to the United States for Charges for the next month. Any amount to be paid for past due payment of Charges and the Tiered Pricing Component shall be computed pursuant to Article 20 of this Contract.

(e) The Contractor shall pay for any Water Delivered under subdivision (a), (f), or (g) of Article 3 of this Contract as determined by the Contracting Officer pursuant to applicable statutes, associated regulations, any applicable provisions of guidelines or ratesetting policies: Provided, That the Rate for Water Delivered under subdivision (f) of Article 3 of this Contract shall be no more than the otherwise applicable Rate for M&I Water under subdivision (a) of this Article.

(f) Payments to be made by the Contractor to the United States under this Contract may be paid from any revenues available to the Contractor.

(g) All revenues received by the United States from the Contractor relating to the delivery of Project Water or the delivery of non-Project water through Project facilities shall be

allocated and applied in accordance with Federal Reclamation law and the associated rules or regulations, and the then-current Project ratesetting policies for M&I Water.

(h) The Contracting Officer shall keep its accounts pertaining to the administration of the financial terms and conditions of its long-term contracts, in accordance with applicable Federal standards, so as to reflect the application of Project costs and revenues. The Contracting Officer shall, each Year upon request of the Contractor, provide to the Contractor a detailed accounting of all Project and Contractor expense allocations, the disposition of all Project and Contractor revenues, and a summary of all water delivery information. The Contracting Officer and the Contractor shall enter into good faith negotiations to resolve any discrepancies or disputes relating to accountings, reports, or information.

(i) The parties acknowledge and agree that the efficient administration of this Contract is their mutual goal. Recognizing that experience has demonstrated that mechanisms, policies, and procedures used for establishing Rates, Charges, and Tiered Pricing Components, and/or for making and allocating payments, other than those set forth in this Article may be in the mutual best interest of the parties, it is expressly agreed that the parties may enter into agreements to modify the mechanisms, policies, and procedures for any of those purposes while this Contract is in effect without amending this Contract.

(j) (1) Beginning at such time as the total of the deliveries of Class 1 Water and Class 2 Water in a Year exceed 80 percent of the Contract Total, then before the end of the month following the month of delivery the Contractor shall make an additional payment to the United States equal to the applicable Tiered Pricing Component. The Tiered Pricing Component for the total of the

deliveries of Class 1 Water and Class 2 Water in excess of 80 percent of the Contract Total, but less than or equal to 90 percent of the Contract Total, shall equal one-half of the difference between the Rate established under subdivision (a) of this Article and the M&I Full Cost Water Rate. The Tiered Pricing Component for the total of the deliveries of Class 1 Water and Class 2 Water which exceeds 90 percent of the Contract total shall equal the difference between (i) the Rate established under subdivision (a) of this Article and (ii) the M&I Full Cost Water Rate.

(2) Omitted.

(3) For purposes of determining the applicability of the Tiered Pricing Component pursuant to this Article, Water Delivered shall include Project Water that the Contractor transfers to others but shall not include Project Water transferred and delivered to the Contractor.

(k) For the term of this Contract, Rates under the respective ratesetting policies will be established to recover only reimbursable O&M (including any deficits) and capital costs of the Project, as those terms are used in the then-current Project ratesetting policies, and interest, where appropriate, except in instances where a minimum Rate is applicable in accordance with the relevant Project ratesetting policy. Changes of significance in practices which implement the Contracting Officer's ratesetting policies will not be implemented until the Contracting Officer has provided the Contractor an opportunity to discuss the nature, need, and impact of the proposed change.

(l) Except as provided in subsections 3405(a)(1)(B) and 3405(f) of the CVPIA, the Rates for Project Water transferred by the Contractor shall be the Contractor's Rates adjusted upward or downward to reflect the changed costs, if any, incurred by the Contracting Officer in the

delivery of the transferred Project Water to the transferee's point of delivery in accordance with the then-applicable Project ratesetting policy.

(m) Omitted.

(n) Omitted.

8. Omitted.

SALES, TRANSFERS, OR EXCHANGES OF WATER

9. (a) The right to receive Project Water provided for in this Contract may be sold, transferred, or exchanged to others for reasonable and beneficial uses within the State of California if such sale, transfer, or exchange is authorized by applicable Federal and State laws, and applicable guidelines or regulations then in effect. No sale, transfer, or exchange of Project Water under this Contract may take place without the prior written approval of the Contracting Officer, except as provided for in subdivision (b) of this Article, and no such sales, transfers, or exchanges shall be approved absent all appropriate environmental documentation including, but not limited to, documents prepared pursuant to the NEPA and ESA. Such environmental documentation should include, as appropriate, an analysis of groundwater impacts and economic and social effects, including environmental justice, of the proposed water transfers on both the transferor and transferee.

(b) In order to facilitate efficient water management by means of water transfers of the type historically carried out among Project Contractors located within the same geographical area and to allow the Contractor to participate in an accelerated water transfer program during the term of this Contract, the Contracting Officer shall prepare, as appropriate, all necessary environmental

documentation including, but not limited to, documents prepared pursuant to NEPA and ESA, analyzing annual transfers within such geographical areas, and the Contracting Officer shall determine whether such transfers comply with applicable law. Following the completion of the environmental documentation, such transfers addressed in such documentation shall be conducted with advance notice to the Contracting Officer, but shall not require prior written approval by the Contracting Officer. Such environmental documentation and the Contracting Officer's compliance determination shall be reviewed every five years and updated, as necessary, prior to the expiration of the then-existing five-year period. All subsequent environmental documentation shall include an alternative to evaluate not less than the quantity of Project Water historically transferred within the same geographical area.

(c) For a water transfer to qualify under subdivision (b) of this Article, such water transfer must: (i) be for irrigation purposes for lands irrigated within the previous three years, for M&I use, groundwater recharge, water banking, or fish and wildlife resources; not lead to land conversion; and be delivered to established cropland, wildlife refuges, groundwater basins or M&I use; (ii) occur within a single Year; (iii) occur between a willing seller and a willing buyer; (iv) convey water through existing facilities with no new construction or modifications to facilities and be between existing Project Contractors and/or the Contractor and the United States, Department of the Interior; and (v) comply with all applicable Federal, State, and local or tribal laws and requirements imposed for protection of the environment and Indian Trust Assets, as defined under Federal law.

APPLICATION OF PAYMENTS AND ADJUSTMENTS

10. (a) The amount of any overpayment by the Contractor of the Contractor's O&M, capital, and deficit (if any) obligations for the Year shall be applied first to any current liabilities of the Contractor arising out of this Contract then due and payable. Overpayments of more than $1,000 shall be refunded at the Contractor's request. In lieu of a refund, any amount of such overpayment, at the option of the Contractor, may be credited against amounts to become due to the United States by the Contractor. With respect to overpayment, such refund or adjustment shall constitute the sole remedy of the Contractor or anyone having or claiming to have the right to the use of any of the Project Water supply provided for herein. All credits and refunds of overpayments shall be made within 30 days of the Contracting Officer obtaining direction as to how to credit or refund such overpayment in response to the notice to the Contractor that it has finalized the accounts for the Year in which the overpayment was made.

(b) All advances for miscellaneous costs incurred for work requested by the Contractor pursuant to Article 25 of this Contract shall be adjusted to reflect the actual costs when the work has been completed. If the advances exceed the actual costs incurred, the difference will be refunded to the Contractor. If the actual costs exceed the Contractor's advances, the Contractor will be billed for the additional costs pursuant to Article 25.

TEMPORARY REDUCTIONS--RETURN FLOWS

11. (a) Subject to: (i) the authorized purposes and priorities of the Project and the requirements of Federal law and (ii) the obligations of the United States under existing contracts, or renewals thereof, providing for water deliveries from the Project, the Contracting Officer shall make

all reasonable efforts to optimize Project Water deliveries to the Contractor as provided in this Contract.

(b) The Contracting Officer or Operating Non-Federal Entity may temporarily discontinue or reduce the quantity of Water Delivered to the Contractor as herein provided for the purposes of investigation, inspection, maintenance, repair, or replacement of any of the Project facilities or any part thereof necessary for the delivery of Project Water to the Contractor, but so far as feasible the Contracting Officer or Operating Non-Federal Entity will give the Contractor due notice in advance of such temporary discontinuance or reduction, except in case of emergency, in which case no notice need be given: Provided, That the United States shall use its best efforts to avoid any discontinuance or reduction in such service. Upon resumption of service after such reduction or discontinuance, and if requested by the Contractor, the United States will, if possible, deliver the quantity of Project Water which would have been delivered hereunder in the absence of such discontinuance or reduction.

(c) The United States reserves the right to all seepage and return flow water derived from Water Delivered to the Contractor hereunder which escapes or is discharged beyond the Contractor's Service Area: Provided, That this shall not be construed as claiming for the United States any right to seepage or return flow being put to reasonable and beneficial use pursuant to this Contract within the Contractor's Service Area by the Contractor or those claiming by, through, or under the Contractor.

CONSTRAINTS ON THE AVAILABILITY OF WATER

12. (a) In its operation of the Project, the Contracting Officer will use all reasonable means to guard against a Condition of Shortage in the quantity of water to be made available to the Contractor pursuant to this Contract. In the event the Contracting Officer determines that a Condition of Shortage appears probable, the Contracting Officer will notify the Contractor of said determination as soon as practicable.

(b) If there is a Condition of Shortage because of errors in physical operations of the Project, drought, other physical causes beyond the control of the Contracting Officer, or actions taken by the Contracting Officer to meet legal obligations then, except as provided in subdivision (a) of Article 18 of this Contract, no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom.

(c) The United States shall not execute contracts which together with this Contract, shall in the aggregate provide for furnishing during the life of this Contract or any renewals hereof Class 1 Water in excess of 800,000 acre-feet per Year or Class 2 Water in excess of 1,401,475 acre-feet per Year: Provided, That, subject to subdivision (l) of Article 3 of this Contract, the limitation placed on Class 2 Water contracts shall not prohibit the United States from entering into temporary contracts of one year or less in duration for delivery of Project Water to other entities if such water is not necessary to meet the schedules as may be submitted by all Friant Division long-term water service contractors entitled to receive Class 1 Water and/or Class 2 Water under their water service contracts. Nothing in this subdivision shall limit the Contracting Officer's ability to take actions that result in the availability of new water supplies to be used for Project purposes and

allocating such new supplies: Provided, That the Contracting Officer shall not take such actions until after consultation with the Friant Division Project Contractors.

(d) The Contracting Officer shall not deliver any Class 2 Water pursuant to this or any other contract for water service heretofore or hereafter entered into any Year unless and until the Contracting Officer determines that the cumulative total quantity of Class 1 Water specified in subdivision (c) of this Article will be available for delivery in said Year. If the Contracting Officer determines there is or will be a shortage in any Year in the quantity of Class 1 Water available for delivery, the Contracting Officer shall apportion the available Class 1 Water among all contractors entitled to receive such water that will be made available at Friant Dam in accordance with the following:

(1) A determination shall be made of the total quantity of Class 1 Water at Friant Dam which is available for meeting Class 1 Water contractual commitments, the amount so determined being herein referred to as the available supply.

(2) The total available Class 1 supply shall be divided by the Class 1 Water contractual commitments, the quotient thus obtained being herein referred to as the Class 1 apportionment coefficient.

(3) The total quantity of Class 1 Water under Article 3 of this Contract shall be multiplied by the Class 1 apportionment coefficient and the result shall be the quantity of Class 1 Water required to be delivered by the Contracting Officer to the Contractor for the respective Year, but in no event shall such amount exceed the total quantity of Class 1 Water specified in subdivision (a) of Article 3 of this Contract.

(e) If the Contracting Officer determines there is less than the quantity of Class 2 Water which the Contractor otherwise would be entitled to receive pursuant to Article 3 of this Contract, the quantity of Class 2 Water which shall be furnished to the Contractor by the Contracting Officer will be determined in the manner set forth in paragraphs (1), (2), and (3), of subdivision (d) of this Article substituting the term "Class 2" for the term "Class 1."

(f) In the event that in any Year there is made available to the Contractor, by reason of any shortage or apportionment as provided in subdivisions (a), (d), or (e) of this Article, or any discontinuance or reduction of service as set forth in subdivision (b) of Article 11 of this Contract, less than the quantity of water which the Contractor otherwise would be entitled to receive hereunder, there shall be made an adjustment on account of the amounts already paid to the Contracting Officer by the Contractor for Class 1 Water and Class 2 Water for said Year in accordance with Article 10 of this Contract.

13. Omitted.

RULES AND REGULATIONS

14. (a) The parties agree that the delivery of Project Water or use of Federal facilities pursuant to this Contract is subject to Federal Reclamation law, as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Federal Reclamation law.

(b) The terms of this Contract are subject to any enforceable order, judgment, and/or settlement in NRDC v. Patterson, No. CIVS 88-1658-LKK-EM and shall be timely modified as necessary to effectuate or facilitate any final order, judgment, or settlement in said litigation.

(c) Omitted.

WATER AND AIR POLLUTION CONTROL

15. The Contractor, in carrying out this Contract, shall comply with all applicable water and air pollution laws and regulations of the United States and the State of California, and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities.

QUALITY OF WATER

16. (a) Project facilities used to deliver Project Water to the Contractor pursuant to this Contract shall be operated and maintained to enable the United States to deliver Project Water to the Contractor in accordance with the water quality standards specified in subsection 2(b) of the Act of August 26, 1937 (50 Stat. 865), as added by Section 101 of the Act of October 27, 1986 (100 Stat. 3050) or other existing Federal laws. The United States is under no obligation to construct or furnish water treatment facilities to maintain or to improve the quality of Water Delivered to the Contractor pursuant to this Contract. The United States does not warrant the quality of Water Delivered to the Contractor pursuant to this Contract.

(b) The O&M of Project facilities shall be performed in such manner as is practicable to maintain the quality of raw water made available through such facilities at the highest level reasonably attainable as determined by the Contracting Officer. The Contractor shall be responsible for compliance with all State and Federal water quality standards applicable to surface and subsurface agricultural drainage discharges generated through the use of Federal or Contractor facilities or Project Water provided by the Contractor within the Contractor's Service Area.

WATER ACQUIRED BY THE CONTRACTOR OTHER THAN FROM THE UNITED STATES

17. (a) Omitted.

(b) Water or water rights now owned or hereafter acquired by the Contractor, other than from the United States, may be stored, conveyed, and/or diverted through Project facilities, subject to the completion of appropriate environmental documentation, with the approval of the Contracting Officer and the execution of any contract determined by the Contracting Officer to be necessary, consistent with the following provisions:

(1) The Contractor may introduce non-Project water into Project facilities and deliver said water within the Contractor's Service Area subject to payment to the United States and/or to any applicable Operating Non-Federal Entity of an appropriate rate as determined by the applicable Project ratesetting policy, the RRA, and the Project use power policy, if such Project use power policy is applicable, each as amended, modified, or superseded from time to time.

(2) Delivery of such non-Project water in and through Project facilities shall only be allowed to the extent such deliveries do not: (i) interfere with other Project purposes as determined by the Contracting Officer; (ii) reduce the quantity or quality of water available to other Project Contractors; (iii) interfere with the delivery of contractual water entitlements to any other Project Contractors; or (iv) interfere with the physical maintenance of the Project facilities.

(3) Neither the United States nor the Operating Non-Federal Entity shall be responsible for control, care, or distribution of the non-Project water before it is introduced into or after it is delivered from the Project facilities. The Contractor hereby releases and agrees to defend

and indemnify the United States and the Operating Non-Federal Entity, and their respective officers, agents, and employees, from any claim for damage to persons or property, direct or indirect, resulting from the acts of the Contractor its officers', employees', agents', or assigns' act(s) in (i) extracting or diverting non-Project water from any source, or (ii) diverting such non-Project water into Project facilities.

(4) Diversion of such non-Project water into Project facilities shall be consistent with all applicable laws, and if involving groundwater, consistent with any groundwater management plan for the area from which it was extracted.

(5) After Project purposes are met, as determined by the Contracting Officer, the United States and the Contractor shall share priority to utilize the remaining capacity of the facilities declared to be available by the Contracting Officer for conveyance and transportation of non-Project water prior to any such remaining capacity being made available to non-Project contractors.

OPINIONS AND DETERMINATIONS

18. (a) Where the terms of this Contract provide for actions to be based upon the opinion or determination of either party to this Contract, said terms shall not be construed as permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or determinations. Both parties, notwithstanding any other provisions of this Contract, expressly reserve the right to seek relief from and appropriate adjustment for any such arbitrary, capricious, or unreasonable opinion or determination. Each opinion or determination by either party shall be provided in a timely manner. Nothing in subdivision (a) of Article 18 of this Contract is intended to

or shall affect or alter the standard of judicial review applicable under Federal law to any opinion or determination implementing a specific provision of Federal law embodied in statute or regulation.

(b) The Contracting Officer shall have the right to make determinations necessary to administer this Contract that are consistent with the expressed and implied provisions of this Contract, the laws of the United States and of the State of California, and the rules and regulations promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with the Contractor to the extent reasonably practicable.

COORDINATION AND COOPERATION

19. (a) In order to further their mutual goals and objectives, the Contracting Officer and the Contractor shall communicate, coordinate, and cooperate with each other, and with other affected Project Contractors, in order to improve the operation and management of the Project. The communication, coordination, and cooperation regarding operations and management shall include, but not be limited to, any action which will or may materially affect the quantity or quality of Project Water supply, the allocation of Project Water supply, and Project financial matters including, but not limited to, budget issues. The communication, coordination, and cooperation provided for hereunder shall extend to all provisions of this Contract. Each party shall retain exclusive decision making authority for all actions, opinion, and determinations to be made by the respective party.

(b) Within 120 days following the effective date of this Contract, the Contractor, other affected Project Contractors, and the Contracting Officer shall arrange to meet with interested Project Contractors to develop a mutually agreeable, written Project-wide process, which may be amended as necessary, separate and apart from this Contract. The goal of this process shall be to

provide, to the extent practicable, the means of mutual communication and interaction regarding significant decisions concerning Project operation and management on a real-time basis.

(c) It is the intent of the Secretary to improve water supply reliability. To carry out this intent:

(1) The Contracting Officer will, at the request of the Contractor, assist in the development of integrated resource management plans for the Contractor. Further, the Contracting Officer will, as appropriate, seek authorizations for implementation of partnerships to improve water supply, water quality, and reliability.

(2) The Secretary will, as appropriate, pursue program and project implementation and authorization in coordination with Project Contractors to improve the water supply, water quality, and reliability of the Project for all Project purposes.

(3) The Secretary will coordinate with Project Contractors and the State of California to seek improved water resource management.

(4) The Secretary will coordinate actions of agencies within the Department of the Interior that may impact the availability of water for Project purposes.

(5) The Contracting Officer shall periodically, but not less than annually, hold division level meetings to discuss Project operations, division level water management activities, and other issues as appropriate.

(d) Without limiting the contractual obligations of the Contracting Officer under the other Articles of this Contract, nothing in this Article shall be construed to limit or constrain the Contracting Officer's ability to communicate, coordinate, and cooperate with the Contractor or other

interested stakeholders or to make decisions in a timely fashion as needed to protect health, safety, or the physical integrity of structures or facilities.

CHARGES FOR DELINQUENT PAYMENTS

20. (a) The Contractor shall be subject to interest, administrative, and penalty charges on delinquent installments or payments. When a payment is not received by the due date, the Contractor shall pay an interest charge for each day the payment is delinquent beyond the due date. When a payment becomes sixty (60) days delinquent, the Contractor shall pay an administrative charge to cover additional costs of billing and processing the delinquent payment. When a payment is delinquent ninety (90) days or more, the Contractor shall pay an additional penalty charge of six (6%) percent per year for each day the payment is delinquent beyond the due date. Further, the Contractor shall pay any fees incurred for debt collection services associated with a delinquent payment.

(b) The interest charge rate shall be the greater of the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of one-half of one (0.5%) percent per month prescribed by Section 6 of the Reclamation Project Act of 1939 (Public Law 76-260). The interest charge rate shall be determined as of the due date and remain fixed for the duration of the delinquent period.

(c) When a partial payment on a delinquent account is received, the amount received shall be applied, first to the penalty, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.

EQUAL OPPORTUNITY

21. During the performance of this Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of payment or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without discrimination because of race, color, religion, sex, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the said labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by said amended Executive Order and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Contracting Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in said amended Executive Order, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of said amended Executive Order, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

22. (a) The obligation of the Contractor to pay the United States as provided in this Contract is a general obligation of the Contractor notwithstanding the manner in which the obligation may be distributed among the Contractor's water users and notwithstanding the default of individual water users in their obligations to the Contractor.

(b) The payment of charges becoming due hereunder is a condition precedent to receiving benefits under this Contract. The United States shall not make water available to the Contractor through Project facilities during any period in which the Contractor may be in arrears in the advance payment of water rates due the United States. The Contractor shall not furnish water made available pursuant to this Contract for lands or parties which are in arrears in the advance payment of water rates levied or established by the Contractor.

(c) With respect to subdivision (b) of this Article, the Contractor shall have no obligation to require advance payment for water rates which it levies.

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

23. (a) The Contractor shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d), Section 504 of the Rehabilitation Act of 1975 (P.L. 93-112, as amended), the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) and any other applicable civil rights laws, as well as with their respective implementing regulations and guidelines imposed by the U.S. Department of the Interior and/or Bureau of Reclamation.

(b) These statutes require that no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation. By executing this Contract, the Contractor agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

(c) The Contractor makes this agreement in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other Federal financial assistance extended after the date hereof to the Contractor by the Bureau of Reclamation, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Contractor recognizes and agrees that such Federal assistance will be extended in reliance on the representations and agreements made in this Article, and that the United States reserves the right to seek judicial enforcement thereof.

24. Omitted.

CONTRACTOR TO PAY CERTAIN MISCELLANEOUS COSTS

25. In addition to all other payments to be made by the Contractor pursuant to this Contract, the Contractor shall pay to the United States, within 60 days after receipt of a bill and detailed statement submitted by the Contracting Officer to the Contractor for such specific items of direct cost incurred by the United States for work requested by the Contractor associated with this Contract plus indirect costs in accordance with applicable Bureau of Reclamation policies and procedures. All such amounts referred to in this Article shall not exceed the amount agreed to in writing in advance by the Contractor. This Article shall not apply to costs for routine contract administration.

WATER CONSERVATION

26. (a) Prior to the delivery of water provided from or conveyed through Federally constructed or Federally financed facilities pursuant to this Contract, the Contractor shall be implementing an effective water conservation and efficiency program based on the Contractor's water conservation plan that has been determined by the Contracting Officer to meet the conservation and efficiency criteria for evaluating water conservation plans established under Federal law. The water conservation and efficiency program shall contain definite water conservation objectives, appropriate economically feasible water conservation measures, and time schedules for meeting those objectives. Continued Project Water delivery pursuant to this Contract shall be contingent upon the Contractor's continued implementation of such water conservation program. In the event the Contractor's water conservation plan or any revised water conservation plan completed pursuant to subdivision (d) of Article 26 of this Contract have not yet been determined by the Contracting Officer to meet such

criteria, due to circumstances which the Contracting Officer determines are beyond the control of the Contractor, water deliveries shall be made under this Contract so long as the Contractor diligently works with the Contracting Officer to obtain such determination at the earliest practicable date, and thereafter the Contractor immediately begins implementing its water conservation and efficiency program in accordance with the time schedules therein.

(b) Should the amount of M&I Water delivered pursuant to subdivision (a) of Article 3 of this Contract equal or exceed 2,000 acre-feet per Year, the Contractor shall implement the Best Management Practices identified by the time frames issued by the California Urban Water Conservation Council for such M&I Water unless any such practice is determined by the Contracting Officer to be inappropriate for the Contractor.

(c) The Contractor shall submit to the Contracting Officer a report on the status of its implementation of the water conservation plan on the reporting dates specified in the then-existing conservation and efficiency criteria established under Federal law.

(d) At five-year intervals, the Contractor shall revise its water conservation plan to reflect the then-current conservation and efficiency criteria for evaluating water conservation plans established under Federal law and submit such revised water management plan to the Contracting Officer for review and evaluation. The Contracting Officer will then determine if the water conservation plan meets Reclamation's then-current conservation and efficiency criteria for evaluating water conservation plans established under Federal law.

(e) If the Contractor is engaged in direct groundwater recharge, such activity shall be described in the Contractor's water conservation plan.

EXISTING OR ACQUIRED WATER OR WATER RIGHTS

27. Except as specifically provided in Article 17 of this Contract, the provisions of this Contract shall not be applicable to or affect non-Project water or water rights now owned or hereafter acquired by the Contractor or any user of such water within the Contractor's Service Area. Any such water shall not be considered Project Water under this Contract. In addition, this Contract shall not be construed as limiting or curtailing any rights which the Contractor or any water user within the Contractor's Service Area acquires or has available under any other contract pursuant to Federal Reclamation law.

OPERATION AND MAINTENANCE BY OPERATING NON-FEDERAL ENTITY

28. (a) The O&M of a portion of the Project facilities which serve the Contractor, and responsibility for funding a portion of the costs of such O&M, have been transferred to the Operating Non-Federal Entity by separate agreement between the United States and the Operating Non-Federal Entity. That separate agreement shall not interfere with or affect the rights or obligations of the Contractor or the United States hereunder.

(b) The Contracting Officer has previously notified the Contractor in writing that the O&M of a portion of the Project facilities which serve the Contractor has been transferred to the Operating Non-Federal Entity, and therefore, the Contractor shall pay directly to the Operating Non-Federal Entity, or to any successor approved by the Contracting Officer under the terms and conditions of the separate agreement between the United States and the Operating Non-Federal Entity described in subdivision (a) of this Article, all rates, charges, or assessments of any kind, including any assessment for reserve funds, which the Operating Non-Federal Entity or such successor

determines, sets, or establishes for (i) the O&M of the portion of the Project facilities operated and maintained by the Operating Non-Federal Entity or such successor, or (ii) the Friant Division's share of the operation, maintenance, and replacement costs for physical works and appurtenances associated with the Tracy Pumping Plant, the Delta-Mendota Canal, the O'Neill Pumping/Generating Plant, the Federal share of the O'Neill Forebay, the Mendota Pool, and the Federal share of San Luis Unit joint use conveyance and conveyance pumping facilities. Such direct payments to the Operating Non-Federal Entity or such successor shall not relieve the Contractor of its obligation to pay directly to the United States the Contractor's share of the Project Rates, Charges, and Tiered Pricing Component(s) except to the extent the Operating Non-Federal Entity collects payments on behalf of the United States in accordance with the separate agreement identified in subdivision (a) of this Article.

(c) For so long as the O&M of any portion of the Project facilities serving the Contractor is performed by the Operating Non-Federal Entity, or any successor thereto, the Contracting Officer shall adjust those components of the Rates for Water Delivered under this Contract representing the cost associated with the activity being performed by the Operating Non-Federal Entity or its successor.

(d) In the event the O&M of the Project facilities operated and maintained by the Operating Non-Federal Entity is re-assumed by the United States during the term of this Contract, the Contracting Officer shall so notify the Contractor, in writing, and present to the Contractor a revised Exhibit "B" which shall include the portion of the Rates to be paid by the Contractor for Project Water under this Contract representing the O&M costs of the portion of such Project facilities which

have been re-assumed. The Contractor shall, thereafter, in the absence of written notification from the Contracting Officer to the contrary, pay the Rates, Charges, and Tiered Pricing Component(s) specified in the revised Exhibit "B" directly to the United States in compliance with Article 7 of this Contract.

CONTINGENT UPON APPROPRIATION OR ALLOTMENT OF FUNDS

29. The expenditure or advance of any money or the performance of any obligation of the United States under this Contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the Contractor from any obligations under this Contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

BOOKS, RECORDS, AND REPORTS

30. (a) The Contractor shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Contract, including: the Contractor's financial transactions, water supply data, and Project land and right-of-way agreements; water use data; and other matters that the Contracting Officer may require. Reports thereon shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this Contract shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Contract.

(b) Notwithstanding the provisions of subdivision (a) of this Article, no books, records, or other information shall be requested from the Contractor by the Contracting Officer unless such books, records, or information are reasonably related to the administration or performance of this Contract. Any such request shall allow the Contractor a reasonable period of time within which to provide the requested books, records, or information.

(c) At such time as the Contractor provides information to the Contracting Officer pursuant to subdivision (a) of this Article, a copy of such information shall be provided to the Operating Non-Federal Entity.

ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

31. (a) The provisions of this Contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest therein shall be valid until approved in writing by the Contracting Officer.

(b) The assignment of any right or interest in this Contract by either party shall not interfere with the rights or obligations of the other party to this Contract absent the written concurrence of said other party.

(c) The Contracting Officer shall not unreasonably condition or withhold approval of any proposed assignment.

SEVERABILITY

32. In the event that a person or entity who is neither (i) a party to a Project contract, nor (ii) a person or entity that receives Project Water from a party to a Project contract, nor (iii) an association or other form of organization whose primary function is to represent parties to Project contracts, brings an action in a court of competent jurisdiction challenging the legality or enforceability of a provision included in this Contract and said person, entity, association, or organization obtains a final court decision holding that such provision is legally invalid or unenforceable and the Contractor has not intervened in that lawsuit in support of the plaintiff(s), the parties to this Contract shall use their best efforts to (i) within 30 days of the date of such final court decision identify by mutual agreement the provisions in this Contract which must be revised and

(ii) within three months thereafter promptly agree on the appropriate revision(s). The time periods specified above may be extended by mutual agreement of the parties. Pending the completion of the actions designated above, to the extent it can do so without violating any applicable provisions of law, the United States shall continue to make the quantities of Project Water specified in this Contract available to the Contractor pursuant to the provisions of this Contract which were not found to be legally invalid or unenforceable in the final court decision.

RESOLUTION OF DISPUTES

33. Should any dispute arise concerning any provisions of this Contract, or the parties' rights and obligations thereunder, the parties shall meet and confer in an attempt to resolve the dispute. Prior to the Contractor commencing any legal action, or the Contracting Officer referring any matter to Department of Justice, the party shall provide to the other party 30 days' written notice of the intent to take such action: Provided, That such notice shall not be required where a delay in commencing an action would prejudice the interests of the party that intends to file suit. During the 30-day notice period, the Contractor and the Contracting Officer shall meet and confer in an attempt to resolve the dispute. Except as specifically provided, nothing herein is intended to waive or abridge any right or remedy that the Contractor or the United States may have.

OFFICIALS NOT TO BENEFIT

34. No Member of or Delegate to Congress, Resident Commissioner, or official of the Contractor shall benefit from this Contract other than as a water user or landowner in the same manner as other water users or landowners.

CHANGES IN CONTRACTOR'S SERVICE AREA

35. (a) While this Contract is in effect, no change may be made in the Contractor's Service Area, by inclusion or exclusion of lands, dissolution, consolidation, merger, or otherwise, except upon the Contracting Officer's written consent.

(b) Within 30 days of receipt of a request for such a change, the Contracting Officer will notify the Contractor of any additional information required by the Contracting Officer for processing said request, and both parties will meet to establish a mutually agreeable schedule for timely completion of the process. Such process will analyze whether the proposed change is likely to: (i) result in the use of Project Water contrary to the terms of this Contract; (ii) impair the ability of the Contractor to pay for Project Water furnished under this Contract or to pay for any Federally-constructed facilities for which the Contractor is responsible; and (iii) have an impact on any Project Water rights applications, permits, or licenses. In addition, the Contracting Officer shall comply with the NEPA and the ESA. The Contractor will be responsible for all costs incurred by the Contracting Officer in this process, and such costs will be paid in accordance with Article 25 of this Contract.

FEDERAL LAWS

36. By entering into this Contract, the Contractor does not waive its rights to contest the validity or application in connection with the performance of the terms and conditions of this Contract of any Federal law or regulation: Provided, That the Contractor agrees to comply with the terms and conditions of this Contract unless and until relief from application of such Federal law or regulation to the implementing provision of the Contract is granted by a court of competent jurisdiction.

NOTICES

37. Any notice, demand, or request authorized or required by this Contract shall be deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid, or delivered to the Area Manager, South-Central California Area Office, 1243 "N" Street, Fresno, California 93721, and on behalf of the United States, when mailed, postage prepaid, or delivered to the City of Fresno, Public Utilities Director, 2600 Fresno Street, Room 3065, Fresno, California 93721-3624. The designation of the addressee or the address may be changed by notice given in the same manner as provided in this Article for other notices.

CONFIRMATION OF CONTRACT

38. The Contractor, after the execution of this Contract, shall furnish to the Contracting Officer evidence that pursuant to the laws of the State of California the Contractor is a legally constituted entity, and the Contract is lawful, valid, and binding on the Contractor. This Contract shall not be binding on the United States until such evidence has been provided to the Contracting Officer's satisfaction.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

APPROVED AS TO LEGAL FORM AND SUFFICIENCY
James E. Tucker
OFFICE OF REGIONAL SOLICITOR
DEPARTMENT OF THE INTERIOR

By: _____
Regional Director, Mid-Pacific Region
Bureau of Reclamation

(SEAL)

CITY OF FRESNO

By: _____
City Manager

Attest:

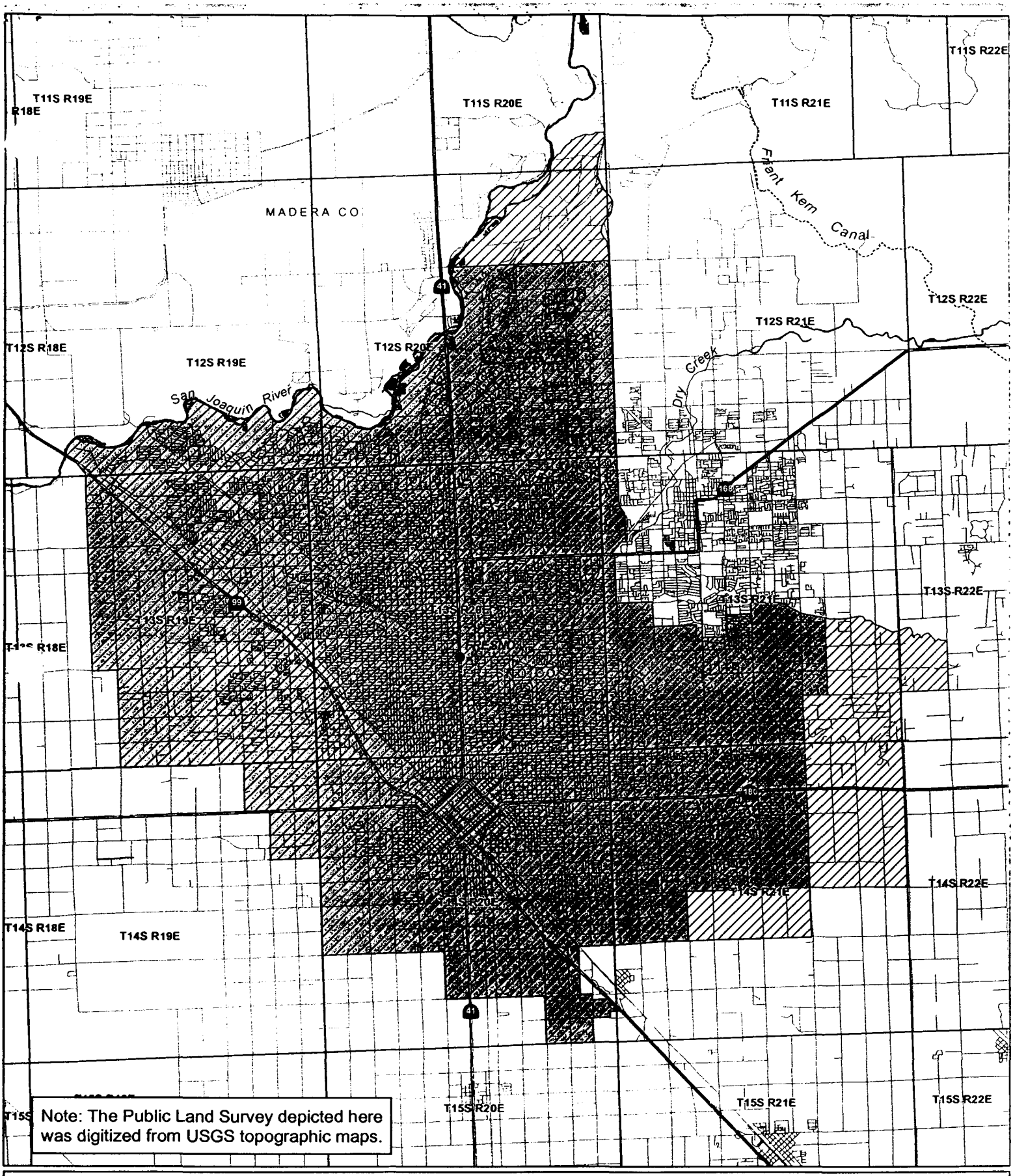
By: Rebecca E. Klisch
City Clerk 7-25-05

By: _____
Public Utilities Director

Approved as to form:

Hilda Cantu Montez
City Attorney

(I:\LTRC\Final Draft LTRC's – Fresno, Tracy\City of Fresno R. O. Final Draft Contract 05-04-2005.doc)



Contractor's Proposed Service Area (Sphere of Influence)

Contractor's Current Service Area

City of Fresno

Contract No. 14-06-200-8901-LTR1

EXHIBIT A

Miles

0 0.5 1 2 3 4

Date: October 26, 2004

File Name: N:\districts\contracts\city_of_fresno\city_of_fresno2.mxd

214-208-12705

EXHIBIT B
CITY OF FRESNO
WATER RATES AND CHARGES

	2005 Rates Per Acre-Foot M&I Water
O&M AND COST-OF-SERVICE RATES:	
Capital Rates:	$20.04
O&M Rates:	
Water Marketing	$ 3.89
Storage	$ 6.67
Conveyance	*
Deficit Rates:	
Non-Interest Bearing	
Interest Bearing	$53.53
CFO/PER Adj. Rate **	$ 1.70
TOTAL COST-OF-SERVICE RATES (COS):	$85.83
M&I FULL-COST RATE	$97.15
Tiered Pricing Component>80%<=90% of Contract	
Total [Full Cost Rate – COS Rate /2]:	$ 5.66
Tiered Pricing Component>90% of Contract	
Total [Full Cost Rate – COS Rate]:	$11.32
SURCHARGES UNDER PUB. L. 102-575 TO RESTORATION FUND***	
Friant Surcharge [3406(c)(1)]	$ 7.00
Restoration Payments [3407(d)(2)(A)]	$15.87

* Conveyance and Conveyance Pumping Operation and Maintenance Costs were removed for ratesetting purposes and are to be billed directly to the water authorities.

** Chief Financial Officer (CFO) Adjustment and Provision for Replacement (PFR) Credit are being distributed over a 5-year period beginning in FY2003 for the contractors that requested that the costs be deferred.

*** The surcharges are payments in addition to the water rates and were determined pursuant to Title XXXIV of Public Law 102-575. Restoration fund surcharges under P. L. 102-575 are on a fiscal year basis (10/1-9/30).

EXHIBIT C
METERING PLAN

Completion Date	Item	Comments
03/05*	Contract effective	
01/06	Implementation study	Select and obtain consultant study re implementation
01/06	Submit progress report to Bureau	
12/06	Confirmation of existing meters	Verify integrity and servicing of existing meters
01/07	Submit progress report to Bureau	
06/07	Secure installation contract	Begin implementation of consultant recommendations
12/07	Draft rate ordinance	Initial development of tiered rate structure
01/08	Submit progress report to Bureau	
01/08	Initiate retrofit	Begin installation of meters on existing dwellings
12/08	Meter installation progress	29% (30,000 of approximately 105,000 units installed)
01/09	Submit progress report to Bureau	
12/09	Meter installation progress	43% (45,000 units)
01/10	Submit progress report to Bureau	
03/10	Impose new rate ordinance (fees based on metered use)	New rate structure applicable to currently metered customers. Rates to be effective as new meter installations occur.
12/10	Meter installation progress	62% (65,000 units)
01/11	Submit progress report to Bureau	
12/11	Adopt new rate ordinance	81% (85,000 units)
01/12	Submit compliance report to Bureau	
12/12	Meter installation progress	100% (105,000 units)
01/13	Submit completion report	Retrofit complete.

Schedule subject to change due to unforeseen circumstances.

*This date will be revised at the time the contract is executed on behalf of the United States.

Amendment to Contract
No. 14-06-200-8901-LTR1

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

AMENDMENT TO LONG-TERM RENEWAL CONTRACT BETWEEN
THE UNITED STATES
AND
CITY OF FRESNO
PROVIDING FOR PROJECT WATER SERVICE FROM FRIANT DIVISION

THIS CONTRACT AMENDMENT, is made this 6th day of April, 2007, in pursuance generally of the Act of Congress of June 17, 1902 (32 Stat. 388), and the acts amendatory thereof or supplementary thereto, including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented, July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706), all collectively hereinafter referred to as Federal Reclamation law, between THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, and, CITY OF FRESNO, hereinafter referred to as the Contractor, a public agency of the State of California, duly organized, existing, and acting pursuant to the laws thereof;

WITNESSETH, That:

EXPLANATORY RECITALS

[1st] WHEREAS, the United States and the Contractor entered into a contract dated August 18, 2005, designated Contract No. 14-06-200-8901-LTR1, providing for water service from the Central Valley Project, hereinafter referred to as the "Existing Contract;" and

[2nd] WHEREAS, pursuant to subdivision (b) of Article 14 of the Existing Contract, the terms of the Existing Contract are subject to any enforceable order, judgment and/or settlement in *NRDC* v. *Patterson*, No. CIVS 88-1658-LKK-EM (now styled *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH) and that the Existing Contract shall be timely modified as necessary to effectuate or facilitate any final order, judgment or settlement in said litigation; and

[3rd] WHEREAS, the parties to said litigation have reached agreement on a global resolution of all Claims for Relief in the Seventh Amended Complaint, on the terms and conditions stated in the Stipulation of Settlement dated September 13, 2006, designated Exhibit 1 in the Order Approving Stipulation dated October 23, 2006; and

[4th] WHEREAS, the parties hereto desire to amend the Existing Contract as required by said Stipulation of Settlement.

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, it is hereby agreed as follows:

1. Subdivision (a) of Article 3 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(a) During each Year, consistent with all applicable State water rights, permits, and licenses, Federal law, and the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, and the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH, and subject to the provisions set forth in Articles 11 and 12 of this Contract, the Contracting Officer shall make available for delivery to the Contractor 60,000 acre-feet of Class 1 Water for M&I purposes. The quantity of Water Delivered to the Contractor in accordance with this subdivision shall be scheduled and paid for pursuant to the provisions of Articles 4 and 7 of this Contract."

2. Subdivision (a) of Article 11 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(a) Subject to: (i) the authorized purposes and priorities of the Project and the requirements of Federal law, and the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH and (ii) the obligations of the United States under existing contracts, or renewals thereof, providing for water deliveries from the Project, the Contracting Officer shall make all reasonable efforts to optimize Project Water deliveries to the Contractor as provided in this Contract."

3. Subdivision (b) of Article 12 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(b) If there is a Condition of Shortage because of errors in physical operations of the Project, drought, other physical causes beyond the control of the Contracting Officer or actions taken by the Contracting Officer to meet legal obligations, including but not limited to obligations pursuant to the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH then, except as provided in subdivision (a) of Article 18 of this Contract, no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom."

4. Subdivision (b) of Article 14 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(b) The terms of this Contract are subject to the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH. Nothing in this Contract shall be interpreted to limit or interfere with the full implementation of this Settlement, Order, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement."

5. Except as specifically amended herein, the Existing Contract is valid and shall continue in full force and effect as originally written and executed.

IN WITNESS WHEREOF, the parties hereto have executed this Contract Amendment as of the day and year first above written.

APPROVED AS TO LEGAL FORM AND SUFFICIENCY
OFFICE OF REGIONAL SOLICITOR
DEPARTMENT OF THE INTERIOR

THE UNITED STATES OF AMERICA

By: _____
Regional Director, Mid-Pacific Region
Bureau of Reclamation

CITY OF FRESNO

(SEAL)

By: _____
City Manager

By: _____
Public Utilities Director

Attest:

By: _____ (3/26/07)
City Clerk

Approved as to form:

By: _____
City Attorney

City of Fresno and Fresno Irrigation District Agreements

REVISED, AMENDED AND RESTATED COOPERATIVE AGREEMENT BETWEEN FRESNO IRRIGATION DISTRICT AND CITY OF FRESNO FOR WATER UTILIZATION AND CONVEYANCE

THIS AGREEMENT is entered into as of December 20, 2016 by and between the Fresno Irrigation District, an irrigation district (herein called "District") and City of Fresno, a municipal corporation (herein called "City").

WITNESSETH:

WHEREAS, District is an irrigation district organized and existing under the laws of the State of California and is the owner of certain water supplies, water rights and a water distribution system that can convey water to lands both within and outside District boundaries; and

WHEREAS, City is a municipal corporation with boundaries largely overlapping those of District and is the owner of a water distribution system for the distribution of water to lands both in and outside the exterior boundaries of City; and

WHEREAS, District and City have heretofore entered into a cooperative program of water utilization between said parties evidenced by a written agreement for such water utilization and conveyance dated August 12, 1970, which by its terms and by the terms of amendments thereto terminated on May 30, 1976; and

WHEREAS, District and City continued with said cooperative program and entered into a replacement contract for water utilization and conveyance dated May 25, 1976 ("1976 Agreement"); and

WHEREAS, District and City wish to amend and restate the 1976 Agreement in its entirety in order to continue with and expand said cooperative program to recognize changed circumstances affecting them via this Revised, Amended and Restated Cooperative Agreement between Fresno Irrigation District and City of Fresno for Water Utilization and Conveyance ; and

WHEREAS, certain provisions of this Agreement are specifically authorized by, and entered into pursuant to, Chapter 9 (commencing with Section 26670), Part 10, Division 11 of the California Water Code; and

WHEREAS, by agreement dated December 22, 2010 between City and the United States of America identified as Contract No. 14-06-200-8901D (the "City Bureau Contract"), City is entitled to purchase certain water from the United States; and

WHEREAS, by agreement dated December 22, 2010 between District and the United States of America identified as Contract No. 14-06-200-1122D (the "District Bureau Contract"), District is entitled to purchase certain water from the United States; and

WHEREAS, District holds rights to Kings River water and storage in Pine Flat Reservoir on the Kings River, subject to various contracts with the United States of America, water supply schedules and agreements by and among members of the Kings River Water Association and others, judicial and regulatory decrees, and the water rights governing the diversion and use of Kings River water, all as they may be amended or supplemented from time to time (collectively, the "Kings River Agreements"); and

WHEREAS, it is recognized by District and City that District is primarily charged with the distribution and delivery of water within District for Agricultural Use and that its canals and distribution system must primarily be used for that purpose; and

WHEREAS, it is recognized by both District and City that many inhabitants of District also require water for domestic, industrial or fire protection purposes supplied to them by City; and

WHEREAS, under the 1976 Agreement, Kings River water was available to City once lands within District boundaries with surface water allotments were annexed into City and were covered by the 1976 Agreement's contract rate for surface water delivery to City by District for those lands; and

WHEREAS, City and District now wish to limit the amount of Kings River water available to City to provide more certainty regarding water supply availability and to address City's current and anticipated needs and circumstances; and

WHEREAS, City and District are both committed to working cooperatively under the Sustainable Groundwater Management Act ("SGMA") so that the groundwater basin shared by City and District is sustainable and so that undesirable results (as defined in SGMA) are minimized or avoided; and

WHEREAS, City and District recognize that changes to the operations of the Central Valley Project have impacted the availability of water from said project; and

WHEREAS, City has heretofore used much of the water delivered to it under the 1976 Agreement for groundwater recharge because of City's historical reliance on groundwater, and therefore did not require delivery of water year around; and

WHEREAS, City desires to use more of its surface water for direct delivery to its water users and ratepayers while limiting its reliance on groundwater; and

WHEREAS, with the development of its surface water treatment facilities ("SWTFs") City now requires a long-term, reliable and certain surface water supply, deliverable continuously year around; and

WHEREAS, conveyance of raw surface water to the SWTFs on a continuous year around basis will require, among other things, (i) new conveyance infrastructure built by City to overcome certain operational challenges and/or interruptions to District's infrastructure to accommodate normal and routine maintenance of District's canals and pipelines than have historically delivered surface water to City, (ii) District to alter its operations and incur additional

costs to make Out of Season Deliveries, and (iii) the use of new management techniques by District, with the attendant costs, including without limitation water sales, purchases, transfers and exchanges, to meet the need for a continuous supply of surface water to City's SWTFs, all while addressing SGMA and other legal and regulatory requirements that impact the groundwater basin shared by District and City; and

WHEREAS, providing Out of Season Deliveries by District to City may also require the development of new water supplies and projects to provide the water being sought by City; and

WHEREAS, City acknowledges that District has a great depth of experience, knowledge and expertise in the management of surface water supply resources (including but not limited to water supply sales, purchases, transfers and exchanges); and

WHEREAS, City recognizes that the coordinated management of both District's and City's water supplies by District is desirable to maximize the use of the current water supplies and the future development of water supplies for both parties; and

WHEREAS, City has determined that it is in City's interest, and in the interest of its water users and ratepayers, to engage District to employ District's experience, knowledge and expertise on behalf of City in the management of City's Surface Water pursuant to the terms hereof in order to achieve City's and District's goals described herein and to accommodate City's desire for a continuous year around surface water supply, and District has agreed to be so engaged; and

WHEREAS, the changing conditions and manner of management of water supplies throughout the State of California, and other factors beyond the control of City and District, will require increased vigilance on the part of water purveyors in the Fresno area to cooperate with each other on long-range implementation strategies to improve the availability, reliability, and drought resiliency of water supplies; and

WHEREAS, through this Agreement and additional cooperative efforts, City, District and other entities in the region intend to capture of flood released waters, optimize existing water supply storage assets, develop new water supply storage assets, expand groundwater recharge capacities, engage in strategic water supply sales, transfers and exchanges and enhance the utilization of recycled and/or treated waters; and

WHEREAS, in light of SGMA, environmental regulations, water supply challenges and competition with other users and regions in the State for water supplies, City and District wish to further enhance their cooperative working relationship for the benefit of the water users and ratepayers they serve by entering into this Agreement to provide for strategic, long-range and coordinated water supply planning and management that will optimize water conservation, the efficient uses of water for agricultural and municipal uses, the capture of flood released water, the use of existing water supply storage assets, the development of new water supply storage assets, the expansion of groundwater recharge capacity, the effectiveness of strategic water supply sales, transfers, exchanges and purchases, and the enhancement of recycled water utilization.

NOW, THEREFORE, adopting the foregoing recitals as being applicable to this Agreement, it is mutually agreed as follows:

1. Term. The term of this Agreement shall be for a period commencing on the date it is executed by both District and City and ending at 12:00 o'clock p.m. on the last day of June in the year 2035, and thereafter until terminated by either party as of the last day of February of any subsequent year by written notice to the other party mailed prior to September 1st of the previous year. Upon the execution of this Agreement the 1976 Agreement and all amendments thereto shall be of no further force or effect, except that City agrees to pay District any monies owing or to become owing to District under and according to the terms of the 1976 Agreement, if any.

2. Agreement Subject to Other Obligations. This Agreement shall be at all times subject to all of the terms and conditions of the City Bureau Contract, the District Bureau Contract and the Kings River Agreements, and to the extent that any agreement contained herein is contrary to or inconsistent with any term or condition of those contracts or agreements, that contrary provision of this Agreement shall be unenforceable. In the event any such agreement contained herein shall become unenforceable, the entire Agreement may be terminated by the party adversely affected as of the last day of February of the next succeeding year, by written notice served upon the other party on or before the first day of September of the year preceding such termination.

3. Definitions. For the purpose of this Agreement, the following terms shall be defined as follows:

(a) "Agricultural Use" means the use of water primarily in the production of agricultural crops or livestock including but not restricted to domestic use incidental to such agricultural purposes, the watering of livestock, and underground water replenishment conducted by District.

(b) "City's Friant Supply" means all water to which City is entitled under the City Bureau Contract or otherwise as a result of City's status as a long-term repayment contractor for water service from the Friant Division of the Central Valley Project (CVP), including without limitation Class 1 water, Section 215 water, uncontrolled season water, unreleased restoration flows and recirculated water. City's Friant Supply shall not include any water available to District under the District Bureau Contract or as a result of District's status as a long-term repayment contractor in the Friant Division of the CVP, which water is not governed by this Agreement.

(c) "City's Kings River Supply" means the percentage of District's Kings River Supply available to be delivered to City in a Water Year under this Agreement.

(d) "District's Kings River Supply" means the Kings River water District may deliver to its water users under the Kings River Agreements and applicable judicial and regulatory decrees in a Water Year as the result of the calculated natural flow of the Kings River during that Water Year.

(e) "City's Surface Water" means all water available to City in a Water Year by means other than pumping from the underground water supply, including without limitation

City's Kings River Supply and City's Friant Supply and any surface water supply acquired or developed after the date of this Agreement.

(f) "City's Water Service Area" means all lands within the exterior boundaries of City, and also all lands outside such boundaries that are within the exterior boundaries of District, to which City now delivers water or hereafter consents to deliver water by means of the City Water System and that are not hereafter designated or assessed by District as lands receiving or to receive District Water Service.

(g) "City Water System" means the conduits, pipes and other facilities (including without limitation the SWTFs) owned by City and used by City to convey water to lands whether in or outside City.

(h) "District Water Service" means the furnishing of water by District directly to lands within District by means of the District Water System other than pumping conducted by a landowner or water user directly from the underground water supply upon the lands receiving such water.

(i) "District Water System" means the conduits, pipes, canals, pumping stations and other facilities owned and/or used by District to convey water to lands or facilities whether in or outside of District.

(j) "Excluded Areas" means those acres within the City's Water Service Area that are outside of the District's boundaries.

(k) "Included Acres" means those acres within the City's Water Service Area that are within the District's boundaries.

(l) "Municipal, Industrial and Domestic Uses" means the use of water other than for Agricultural Use, and underground water replenishment conducted by City.

(m) "Out of Season Deliveries" means deliveries of City's Surface Water via the District Water System during periods when District is not otherwise delivering irrigation water to its landowners or water users via the portions of the District Water System used to convey City's Surface Water to the points on the District Water System where City will assume physical control of the delivered water.

(n) "Point of Delivery" means, for water delivered to City via the District Water System, the headworks of the Gould Canal and the Fresno Canal as specified in the applicable schedule, for water delivered to City via the Friant-Kern Canal Raw Water Pipeline, the headworks of the Friant-Kern Canal Raw Water Pipeline, for water delivered to City via the South Raw Water Pipeline, the headworks of the Fresno Canal, and such other location(s) as City and District may mutually agree.

(o) "Transfer" means a water sale, transfer or exchange involving any of City's Friant Supply.

(p) "Water Year" means March 1 of one year through the last day of the following February when used in reference to City's Friant Supply and October 1 of one year through September 30 for the following year when used in reference to City's Kings River Supply or District's Kings River Supply.

4. Management of City's Surface Water. To fulfill the purposes of this Agreement, and to facilitate the continuous and year around supply of water to City's Water System and facilities, District shall undertake, and is hereby appointed by City as City's exclusive agent for the management of City's Surface Water pursuant and subject to the terms of this Agreement, including but not limited to subsection 4(f) below. District's management authority and responsibilities shall terminate with respect to any of City's Surface Water upon delivery of that water to City.

(a) The management authority hereby granted to District shall include without limitation the exclusive right to:

i. Direct the storage and release of City's Surface Water;

ii. Schedule, order and provide for the delivery of City's Surface Water to District's points of diversion;

iii. Facilitate the reasonable and beneficial use of City's Surface Water and other water supplies available to City, while also providing for delivery of water to the applicable Point(s) of Delivery as specified in this Agreement;

iv. Pursue and implement Transfers pursuant to this Agreement; and

v. Take all other actions associated with the management and administration of City's Surface Water prior to its delivery to the applicable Point of Delivery in furtherance of the goals provided in subsection 4(f).

(b) District shall not voluntarily take any action that would:

i. Breach City's Bureau Contract or any other agreement governing any of City's Surface Water;

ii. Result in a long-term reduction in amount of City's Surface Water; or

iii. Result in management or use of City Surface Water inconsistent with the goals provided in subsection 4(f) below, unless City provides prior written authorization of such management or use.

(c) Notwithstanding District's management of City's Surface Water, City shall be solely responsible for, and shall timely pay, all charges and other amounts payable in connection with any of City's Surface Water.

(d) Subject to the express rights of City under this Agreement, City shall take no action that interferes with District's management of City's Surface Water as long as District provides the deliveries thereof in accordance with Section 5.

(e) District shall coordinate with City to define and identify uses of City's Surface Water that benefit City's water users and ratepayers. This coordination shall be performed as described in this subsection.

i. As frequently as appropriate and necessary, and at least annually, City and District shall confer to review available water supply information and data, including without limitation: precipitation, snow pack, and runoff conditions; water storage conditions; relevant environmental programs and projects; forecasted Municipal, Industrial and Domestic Uses; surface water delivery priorities for City; forecasted groundwater pumping required to meet City's forecasted Municipal, Industrial and Domestic Uses; and other pertinent information and data related to water supply availability and water demands for the relevant Water Year(s). City and District shall also confer regarding the anticipated availability of City's Friant Supply, if any, for Transfers.

ii. City will be responsible for providing periodic updates to the City Council and City administration. At least annually, City staff shall provide an informational workshop to the City Council, summarizing ongoing water supply conditions, the implementation of this Agreement and fulfillment of the water supply goals as listed in 4(f), as well as any anticipated water supply issues of concern for the relevant Water Year(s). District shall make reasonable efforts to coordinate with City staff to provide any data, information, and materials required for this annual informational workshop to the City Council.

iii. It is understood that during any given Water Year it may be necessary to adjust the water supply planning forecast established pursuant to the above described process as water supply availability and demands change, and additional information and data are obtained, reviewed, and assessed. City and District shall employ reasonable efforts to meet and confer as necessary to keep each party informed to the extent water supply conditions and plans may change through the relevant Water Year. City shall be responsible for providing informational updates to the City administration to the extent there are material changes to the water supply conditions in any given Water Year.

(f) District's management of City's Surface Water shall at all times be in furtherance of one or more of the following water supply goals:

i. Providing continuous year around water supply to City's SWTFs;

ii. Improving the water supply reliability and drought-resiliency for City;

iii. Improving the operation and utilization of City-owned recharge basins;

iv. Implementing conjunctive-use water management strategies to comply with the SGMA that directly benefit City's water users and ratepayers and indirectly benefit groundwater users in the North Kings Subbasin.

(g) Included as a part of the management of City's Surface Water as described above, District shall diligently pursue Transfers of any of City's Friant Supply that City advises District that City will not require during a particular Water Year ("Temporarily Unused Friant Water").

i. Upon identifying a potential Transfer opportunity, and prior to executing the Transfer, District shall notify City of the potential Transfer opportunity, and the water quantity, unit price, delivery dates and terms, and any other material matters associated with the Transfer. This is a notification procedure and not an approval procedure.

ii. All Transfers of Temporarily Unused Friant Water pursued by District shall be in full conformance with City's water supply goals as described in Section 4(f) or otherwise agreed by City and District, and shall be limited to supporting Agricultural Use rather than urban growth or development in other jurisdictions.

iii. City shall not be prohibited from unilaterally pursuing Transfers of Temporarily Unused Friant Water; provided, that any such Transfers shall first be discussed and coordinated with District before they are implemented and shall not be undertaken over District's reasonable objection and the benefits of any such Transfer shall be allocated in accordance with subsections (h), (i) and (j) below.

iv. For avoidance of doubt, District's obligations under this Section 4(g) are limited to making reasonable and diligent efforts to pursue Transfers of Temporarily Unused Friant Water, and City acknowledges that no assurances can be provided by District that such Transfers can be made or arranged.

(h) The benefits resulting from Transfers shall be allocated in accordance with this subsection. For purposes of this Section 4, "benefits" of a Transfer include, without limitation:

i. The difference between all costs incurred in connection with a Transfer and the amount(s) received as a result of the Transfer,

ii. Water returned as a result of a Transfer, and

iii. Water supply storage or conveyance capacities made available as a result of a Transfer.

To the extent benefits include payments, City shall be reimbursed for its actual and reasonable out of pocket expenses incurred for City's Friant Supply involved in the Transfer,

and each of the parties shall next be reimbursed for any actual and reasonable out of pocket expenses incurred in connection with the Transfer. The net revenue associated with a Transfer shall be the revenue remaining after all parties have been reimbursed their actual and reasonable expenses incurred for the Transfer.

(i) To the extent benefits of a Transfer consist of water supplies, water supply storage or conveyance capacities, the allocation of such benefits as between the parties shall be negotiated by the parties before the Transfer is implemented. In the event the parties cannot negotiate such allocation, the Transfer shall not be pursued.

(j) For each Transfer that generates net revenue, City and District agree that the net revenue shall be distributed and used as follows:

i. 25-percent of the net revenue shall be deposited with City's water enterprise fund;

ii. 25-percent of the net revenue shall be deposited with District for the inspection, operations, maintenance and repair of the District's Conveyance System, which City acknowledges provides a benefit to City ratepayers;

iii. 50-percent off the net revenue shall be deposited into a Water Supply Development Fund to be used to finance water supply development programs and projects that mutually-benefit City and District.

The Water Supply Development Fund shall be a restricted-use fund to be used exclusively for water supply programs and projects that improve water supply availability, reliability and drought resiliency for both District and City. Programs and projects that may be financed from the Water Supply Development Fund include, but are not limited to, water supply purchases, transfers, and exchanges; groundwater storage; and groundwater recharge. Expenditures for water supply purchases, transfers, and exchanges may include any carryover charges and conveyance charges that may be assessed by the State of California, the United States, or other agency, to store, transport and deliver surface water, for the mutual benefit of City and District, using state or federal storage and conveyance facilities.

The Water Supply Development Fund may receive contributions from City, District, and other public agencies approved by both City and District. The Water Supply Development Fund may not receive contributions from private persons, companies, businesses, or organizations.

Prior to encumbering funds from the Water Supply Development Fund, District and City shall mutually agree in writing on the recommended expenditure and the amount to be financed with the Water Supply Development Fund.

District shall serve as the fiscal agent for the Water Supply Development Fund and implement generally accepted public agency or governmental accounting practices in managing the fund assets. District shall subject the fund to an annual audit by independent auditors during the course of District's annual audit of its financial statements. The audit shall

be conducted in accordance with the generally accepted auditing standards by the independent certified public accountant auditing District's financial statements. Upon presentation of District's comprehensive audit report to the District Board of Directors, District shall provide City with a copy of District's audit report. At any time during the term of this Agreement, City may, at its own cost, request to review and audit the financial and accounting records associated with the Water Supply Development Fund. District shall have 30 working days to submit the requested records to City for review and audit.

In the event this Agreement terminates and uncommitted amounts remain in the Water Supply Development Fund, one half of all such amounts shall be promptly distributed free of any restrictions to each of the parties.

(k) By the 25th day of each month, District shall provide City with a written summary of District's utilization of City's Friant Supply for the previous month in substantially the form attached hereto as **Exhibit A**. The written summary will identify water volumes delivered to recharge basins, surface water treatment facilities, other Points of Delivery designated by City, and Transfers. The written summary may be delivered to City by email, facsimile or U.S. mail. For Transfers, the monthly report shall include information regarding the parties involved in the Transfer, the water quantity, unit price, delivery dates and terms, and any other material matters associated with the Transfer.

5. Water Made Available to City.

(a) Subject to all other provisions of this Agreement, District shall deliver to City during each applicable Water Year, for distribution and use by City within City's Water Service Area, each day of each year on a continuous basis in accordance with Section 8 of this Agreement, the City's Surface Water available during relevant Water Year(s) that can be diverted by District at the headworks of the Gould Canal, the Fresno Canal or the Friant-Kern Canal Raw Water Pipeline. City acknowledges that the water delivered may not be City's Surface Water, but rather other water controlled by District in the District Water System of similar quality and equal quantity, including without limitation water recovered from water banks, other water for which City's Surface Water is exchanged, and/or water purchased by District for delivery to City at District's cost, and that references in this Agreement to deliveries of City's Surface Water shall include deliveries thereof of a substitute supply by means of one or more exchanges, transfers, purchases or combinations thereof. At all times, District shall have the right to exchange and to convey for City in place thereof other water of similar quality and equal quantity (except sewer effluent or industrial wastes) available to District.

(b) City's Surface Water shall be deemed delivered to City when it reaches the Point of Delivery specified in the applicable schedule provided and approved under Section 8 of this Agreement, provided that for deliveries made via the District Water System, District shall thereafter convey such water to the points on the District Water System where City will assume physical control of the delivered water.

(c) The parties acknowledge that there may be times when the City Water System is undergoing routine or emergency repairs and maintenance, or subject to other conditions, that preclude City from accepting deliveries under this Agreement. Similarly, the parties

acknowledge that there may be times when the District Water System is undergoing routine or emergency repairs and maintenance, or subject to other conditions, that preclude District from delivering water to City under this Agreement. The parties shall cooperate with the other to minimize the impacts of such events, but neither shall be in breach of this Agreement as a result thereof.

(d) Water delivered to City under this Agreement shall be used by City within City's Water Service Area only for Municipal, Industrial and Domestic Uses, Agricultural Uses incidental thereto, and within the boundaries of District for recharge of the underground water supply by percolation.

City shall not sell, transfer, deliver or exchange any surface water or groundwater to or with any other person or entity without written consent of District first had and obtained.

However, this provision shall not prevent City from entering into separate agreements with any other entity which may have a similar agreement with District for the distribution and use of water received from District under such agreements, provided such separate agreements are entered into with the written consent of District first had and obtained and are subject to all the terms and conditions of this Agreement and District's agreements with such other entities.

(e) District has entered into this Agreement with the understanding that it is, and will continue to be, City's policy to (i) require urban growth to occur sequentially in designated growth areas around City, (ii) promote infill development with City's existing boundaries and (iii) facilitate the successful implementation of SGMA within the groundwater basin shared by City and District by conditioning land use and annexation decisions on the existence of an available water supply to support new development in annexed areas. Consistent with that understanding, for the term of this Agreement, as a condition of the provision of City water service, City shall require the proponent of any proposed development project located outside of City's Water Service Area boundary as of the date of this Agreement to:

i. Define the peak water demands, plus fire protection demands, required to meet the total water supply demands of the entire project at build-out conditions;

ii. Obtain a perpetual surface water supply allocation, right, entitlement or similar from District, or other surface water supply agency, to meet the peak water demands, plus fire protection demands, at build out conditions; and

iii. Dedicate, transfer or assign the perpetual surface water supply allocation, right, entitlement or similar to City.

Once the perpetual water supply has been dedicated, transferred, or assigned to City, the water supply shall be incorporated into City's Surface Water managed by District for City under this Agreement.

In addition, to improve, restore, and maintain the availability, reliability, and drought resiliency of the groundwater and surface water resources in the North Kings Subbasin,

City and District shall jointly advocate that all public water supply systems in the North Kings Subbasin should require the proponents of new development projects to obtain perpetual surface water supply rights, allocations, entitlements, and similar, in sufficient quantity, to meet the all demands at full build out.

(f) In furtherance of the parties' goals under this Agreement, City shall utilize City's Friant Supply to provide water to the City's SWTF served by the South Raw Water Pipeline (as defined below) for the purpose of serving the Excluded Area.

6. Raw Water Pipelines. As soon as reasonably practicable, City shall construct, at its sole cost and expense, two raw water pipelines to serve City's SWTFs (the "Raw Water Pipelines"). One Raw Water Pipeline shall be a direct connection from the Friant-Kern Canal to City's SWTF located at Mile Point 7.58 (the "Friant-Kern Canal Raw Water Pipeline"). The other Raw Water Pipeline shall be a direct connection from the Fresno Canal downstream of the headworks for such canal to City's SWTF located at Trimmer Spring Road (the "South Raw Water Pipeline"). City's T3 SWTF shall continue to be served by the Enterprise and Jefferson Canals that are a part of the District Water System. Once operational, the Raw Water Pipelines shall be used to convey portions of City's Surface Water directly to the SWTFs, and all costs of the operation, maintenance, repair and replacement of the Raw Water Pipelines shall be borne by City; provided, that District shall be entitled to utilize for its own purposes any capacity in the Raw Water Pipelines not required to deliver City's Surface Water, and District shall reimburse City upon demand for any operational costs incurred as a result of District's use of the Raw Water Pipelines. Any third-party property damages resulting from City's efforts and activities related to the operation, maintenance, repair, and replacement of the Raw Water Pipelines shall be received and processed by City in accordance with City's Risk Management policies and procedures.

7. City's Friant Supply. While this Agreement is in effect, City (i) shall not convey any interest in the City Bureau Contract to any party other than District, (ii) shall at all times maintain the City Bureau Contract in effect and (ii) shall not voluntarily decrease the quantity of City's Friant Supply to be made available to City thereunder without the written consent of District. City will use every effort to obtain its maximum entitlement to City's Friant Supply annually as it may become available, and will seek to maximize any other surface water opportunities that may be available to City via the Friant Division of the Central Valley Project. Nothing in this Agreement conveys any ownership interest in the City Bureau Contract to District, which shall at all times remain the sole property of City, nor does this Agreement convey any interest in the District Bureau Contract to City, which shall at all times remain the sole property of District.

8. Schedules of Delivery and Conveyance of Water.

(a) District shall deliver City's Surface Water to City in accordance with schedules provided from time to time by City for approval by District, which approval shall not be unreasonably withheld, delayed or conditioned. Such schedules shall set forth the amounts of water desired by City, the desired timing of deliveries, the facilities by which such water is to be delivered, and the point(s) on the District Water System where City will assume physical control of the delivered water. Deliveries of water by District will take into consideration all relevant

factors, including without limitation (i) the capacity and condition the applicable portions of the District Water System, (ii) City's Bureau Contract, (iii) the District Bureau Contract, (iv) the Kings River Agreements, (v) actual and anticipated water supply conditions, (vi) the requirements of other contracts between the District and third parties (including without limitation the City of Clovis and Fresno County Waterworks District No. 19) and (vii) all other factors pertaining to the distribution, apportionment and use of water available to District.

(b) All schedules submitted by City during each Water Year shall provide for the delivery during that Water Year of all of City's Surface Water that becomes available to City during that Water Year. Notwithstanding the foregoing, City may schedule up to 10,000 acre feet of City's Surface Water that becomes available to City during one Water Year for delivery in the succeeding Water Year ("Rescheduled Water"). City shall timely pay in full all costs imposed by third parties, including without limitation the United States Bureau of Reclamation, as the result of any Rescheduled Water requests or deliveries.

9. Conveyance Losses. City shall bear all losses incurred in the District Water System downstream of the applicable Point of Delivery; provided, that no such losses shall be assessed against City when District is delivering irrigation water to its landowners or water users via the portions of the District Water System used to convey City's Surface Water to the points on the District Water System where City will assume physical control of the delivered water. Conveyance losses chargeable to City shall be computed by multiplying the losses in that portion of any canal used for conveyance of City's Surface Water during the period such water is being so conveyed by the total amount of water being conveyed for City in that canal during such time, divided by the total amount of water flowing in that portion of that canal during the same period.

10. Use by District of Water Not Used by City.

(a) Except for Rescheduled Water, in the event City is unable to use or does not use any of City's Kings River Supply in any Water Year, City shall lose the right to receive such water, and District shall have the right to take and use such water for Agricultural Use in such manner as it may determine.

(b) Except for Rescheduled Water, in the event City is unable to use or does not use any part of City's Friant Supply and District reasonably concludes that it cannot effect a Transfer for all of such unused water as Temporarily Unused Friant Water as described in Section 4(g), City shall nevertheless take and pay for such unused water and District shall have the right to use such water for Agricultural Use, but City may require District to so use such water at such locations as City may direct; provided, however, in the event City does not direct the location at which said water shall be used in time that it may be so used or in the event the District Water System will not permit the conveyance of such water to such location when so directed, or if for any other reason the conveyance of such water to such location at that time is not feasible or practicable, District shall have the right to use such water upon the same conditions as are provided in Section 10(a). Such use of any such water by District shall not relieve City from any payments required to be made by it under the City Bureau Contract or under the terms of this Agreement and its use by District shall not require any payment from District to City.

(c) Except for Rescheduled Water, in the event City is unable to use or does not use any of City's Surface Water that is neither City's Kings River Supply or City's Friant Supply in any Water Year, City shall lose the right to receive such water, and District shall have the right to take and use such water for Agricultural Use in such manner as it may determine. In such event, insofar as the District Water System will permit, and insofar as otherwise may be practicable and equitable as to other landowners, District will use such water for irrigation or percolation in areas in City or east or northeast of City, and will discuss its use with City before it is used elsewhere. However, the ultimate decision concerning such use of such water shall be within the discretion of District.

11. Water Rights Not Transferred. As was the case under the 1976 Agreement, City acknowledges that its rights to City's Kings River Supply under this Agreement are contractual rights and not water rights. Nothing in this Agreement authorizes or shall be construed or deemed to constitute the sale or transfer of a water right from either party to the other and nothing in this Agreement shall constitute the dedication by either party of water or storage to a public use. No right in any water, storage right or water right owned by District or City shall be acquired or lost by virtue of this Agreement or the actions contemplated hereby. At no time shall City make any claim, assert any right or otherwise seek, confirm or perfect in any forum any legal or beneficial interest, right or title to any of District's water supply or storage rights except as expressly set forth herein.

12. City's Sewage Effluent. City shall retain its sewage effluent and recycled water within the boundaries of District for the term of this Agreement, except with the written consent of District first had and obtained. It is the intent of City and District to develop and execute a new agreement addressing such effluent and recycled water use, and this Agreement is to be interpreted so as to be consistent with such new agreement if and when it is executed by the parties.

13. Acreages and City's Kings River Supply.

(a) City's Water Service Area consists of Included Acres and Excluded Acres, and on an annual basis City and District shall prepare a map showing the total number of acres in each area as of the first day of March of each year. When so approved, said map shall be incorporated herein by reference as **Exhibit B** and shall become a part hereof. Said map shall be amended and reapproved by both parties as of the first day of March each year and added to this Agreement as an updated **Exhibit B**. However, City shall keep the District currently advised during the year of any new lands outside of City's Water Service Area to which it commences or consents to deliver water, and District shall keep City so advised as to any new lands designated or assessed by it as lands receiving or to receive District Water Service. When so amended and reapproved as of the first day of March of each year, said map shall conclusively establish the boundaries of and the acreage in each area for all purposes of this Agreement.

(b) City's Kings River Supply shall be the herein-contracted for percentage of District's Kings River Water Supply. Such percentage shall be based on the ratio of Included Acres within City's Water Service Area to the total acres within District's boundaries. In computing the acreage within the Included Acres, the entire acreage shall be measured including properties that may be exempt from assessment for taxation and including adjacent streets,

alleys, roads, highways and other public ways to the center lines thereof. As of the execution of Agreement, and based on the land area sizes defined above, City's Kings River Supply is 25.54 percent of the District's Kings River Supply.

(c) Notwithstanding any other provision of this Agreement, and notwithstanding increases in the Included Acres, City's Kings River Supply shall be limited to 29.00 percent of District's Kings River Supply. At such time when the ratio of Included Acres within City's Water Service Area to the total acres within District equals 29.00 percent, City's Kings River Supply shall remain fixed at 29.00 percent. City and District mutually agree that the increase percentages reflected in this Section 13 include allowances for moderate growth in Growth Area 1 of City's Sphere of Influence as shown in **Exhibit C** (as depicted as Figure IM-2 of the Fresno General Plan).

(d) To improve, restore, and maintain the availability, reliability, and drought resiliency of the groundwater and surface water resources in the North Kings Subbasin, District shall support, and to the extent it has the legal authority to do so shall require, the establishment of water supply limits on all municipal water systems in the North Kings Subbasin.

District acknowledges that it may enter into surface water utilization and conveyance agreements similar to this one with other municipalities in the Kings Subbasin that provide for the delivery of portions of District's Kings River Supply. Subject to the following paragraph of this Agreement, all such agreements entered into after the date of this Agreement shall provide that the percentage of District's Kings River Supply made available to the municipality entering into such agreement shall be determined in a manner similar and comparable to that applied to City in this Agreement.

Should the District enter into such a water utilization and conveyance agreement with another municipality in the Kings River Subbasin after the date of this Agreement that makes available a percentage of District's Kings River Supply to such municipality determined in a manner that is not similar and comparable to that applied to City in this Agreement, at City's request the parties shall negotiate in good faith an adjustment in City's Kings River Supply to apply the same methodology used, and provide the same percentage increase, as granted to the other municipality; provided, that to the extent such other municipality provides additional consideration to District for such different methodology, City shall provide comparable consideration if it requests that such different methodology be used for this Agreement. Any disputes arising as a result of such negotiation shall be resolved pursuant to Section 19.

14. Payment by City to District. In consideration of the water supplies and services provided by District to City under this Agreement, City shall pay to District each Water Year in which this Agreement is effective the following:

(a) The sum calculated by multiplying the number of Included Acres by the per acre assessment imposed as of March 1 of that Water Year on lands in District receiving District Water Service, plus the sum calculated by multiplying the number of Excluded Acres by the per acre assessment imposed as of March 1 of that Water Year on lands in District not receiving District Water Service. Amounts payable to District pursuant to this Section 14(a) shall be paid by City 60% on or before the 20th day of December preceding the Water Year for which such

amounts are due, and the remaining 40% shall be paid on or before the 20th day of June of the following Water Year. City and District acknowledge that during the term of this Agreement, District may convert its rate structure to include a volumetric charge. Concurrently with such a rate structure modification, the parties shall negotiate modifications to this Section 14 so that charges imposed on City under the revised District rate structure are equitable and comparable in proportion and magnitude to the charges imposed on other District customers receiving water for Agricultural Use. Without limiting the foregoing, any volumetric charges imposed on City shall be determined in the same manner as volumetric charges imposed on other District customers receiving water for Agricultural Use.

(b) An out of season water delivery fee determined in accordance with the procedure described in the attached **Exhibit D** for each acre foot of water delivered to City under this Agreement as an Out of Season Delivery (the "Water Delivery Fee"). The Water Delivery Fee shall be payable within 30 days after District delivers City an invoice for such fee indicating the amount of water delivered during the invoice period and the total Water Delivery Fee due. City acknowledges that such fee is in part to compensate District for additional costs and risks incurred for operating its system to make Out of Season Deliveries. No such fee shall be due for water deliveries to City under this Agreement that are not Out of Season Deliveries.

(c) A rescheduling fee for each acre foot of Rescheduled Water determined in accordance with the procedure described in the attached **Exhibit E** (the "Rescheduling Fee"). The Rescheduling Fee shall be payable annually after March 1 of each Water Year within 30 days after District delivers City an invoice for such fee indicating the amount of Rescheduled Water for the applicable Water Year and the total Rescheduling Fee due. City acknowledges that the Rescheduling Fee is necessary to compensate District for additional costs and risks incurred to reschedule water for City from one Water Year to the succeeding Water Year. The Rescheduled Water Fee shall not be applied to any of City's Friant Supply carried over in Millerton Lake, as the Bureau has established a separate fee schedule for City to reschedule City's Friant Water Supply from one Water Year to the succeeding Water Year.

(d) While this Agreement is in effect, District shall not impose District assessments or other charges on landowners within City's Water Service Area or adopt special "municipal and industrial" assessments, rates or charges that would be imposed on or as a result of water deliveries to City under this Agreement. Only the amounts described in this Agreement shall be imposed on any party as a result of deliveries of City's Surface Water by District to City.

(e) Time shall be of the essence for the making of the payments described in this Section 14. If any such payment is not made on the date provided, City shall pay to District in addition to said payment costs, penalties and interest equal to those provided by law to be paid by landowners within District for the late payment of assessments. Such costs, penalties and interest are in addition to any other remedy which District may have against City because of City's failure to pay said payment as above provided.

(f) City acknowledges and agrees that the amounts payable by City pursuant to this Section 14 will vary from year to year and may increase over time. City further acknowledges that, while some of such amounts will be determined with reference to District assessments on its landowners, no amounts payable by City under this Agreement are assessments on City's

landowners. City further agrees that, as they relate to City, such amounts will be imposed as a matter of contract and are not assessments, fees or charges to which Article XIIID of the California Constitution applies. City shall be permitted to participate in public hearings and meetings held in connection with rate-setting, but City shall not assert that Article XIIID of the California Constitution applies to payments required under this Agreement. If City makes such an assertion, this Agreement may be terminated by District in its entirety as of the last day of February of the next succeeding year by written notice served upon City. City shall be responsible to set its rates to its utility users in accordance with applicable law, and shall indemnify and defend District against any claims or legal actions commenced by City's water users or ratepayers to challenge the amounts payable by or to City.

15. Re-negotiations. City and District acknowledge that changed circumstances in the future may:

i. Result in material changes in the size of City's Water Service Area, the number of Excluded Acres and/or the number of Included Acres, and/or

ii. Render the amount of City's Kings River Supply as an increasing percentage of District's Kings River Water Supply inequitable.

Such changed circumstances could result from, among other causes:

i. Annexations or detachments from City and/or District;

ii. Updates in City's Urban Water Management Plan or the Fresno General Plan;

iii. Significant regional economic development projects that require the extension of the City Water System outside of City's Water Service Area. Significant regional economic development projects shall be those that qualify for federal, state, county, or local economic development incentives; or

iv. New legal, regulatory, or environmental requirements placed on water supply agencies by a state or federal government agency.

Should either party to this Agreement determine after January 1, 2036 that such changed circumstances have arisen, it may notify the other of such determination and request that the parties meet to discuss mutually acceptable changes in the number of Excluded Acres, the number of Included Acres and/or the percentage used to determine City's Kings River Supply. Neither party shall be required to engage in such discussions prior to January 1, 2036.

The parties shall thereupon meet in good faith in an attempt to reach agreement on such changes; provided, that if no such agreement is reached within 180 days of the initial meeting, neither party shall be obligated to continue such meetings.

The number of Excluded Acres, the number of Included Acres and City's Kings River Supply shall remain unchanged pending agreement on the changes, and therein documented by a written amendment to this Agreement and executed by both parties.

16. Protection of District Facilities. City shall not permit the development of any parcel of land or the use of any public utility or other easements affecting land within its boundaries if any of the District Water System is located on, under or adjacent to such parcel until City, the landowner and/or the developer enters into an agreement acceptable to District for the repair, rehabilitation, relocation, replacement, reconfiguration or pipelining of the facilities on the parcel, and on any adjacent parcels, all as District determines is necessary or appropriate in order to (i) avoid disruption of District operations or maintenance activities as a result of the development, (ii) make District facilities suitable for operation within a developed area, or (iii) address public safety concerns.

17. No Warranty of Quality. City recognizes that City's Surface Water will be "raw," non-potable and untreated, and that the amount of water included in City's Surface Water will vary from year to year due to a variety of factors beyond the control of District. City further recognizes that wastewater (both treated and untreated) and drainage water are sometimes discharged into the District's canals, and that such discharges from a number or sources will occur and/or continue during the term of this Agreement. Accordingly, except as expressly set forth in this Agreement, District makes no representations or warranties regarding the quality of the water or the amount of water to be delivered to City each Water Year. City recognizes that the treatment of City's Surface Water to make it potable shall be the sole responsibility of City, and City shall assume all risk and responsibility therefor. The character or quality of the water furnished or conveyed hereunder may vary from time to time for reasons including, but not restricted to, the application by District of chemicals to control aquatic and ditch bank weeds, and the open canals of District are always subject to possible pollution from outside sources. District does not guarantee in any respect or assume any responsibility for the chemical, bacterial or other quality of the water made available to City through the District Water System.

18. Indemnity. City and District each agree to indemnify the other and save the other free and harmless of and from any and all liability, damage, loss, cost or expense, incurred or suffered by the other, by reason of damage to the property of the other or injury to any other person or property arising out of its own conduct, acts, omissions or faults, in connection with any matter related to this contract.

19. Dispute Resolution.

(a) District and City staff shall exercise every effort to resolve disputes through the development of a consensus.

(b) To the extent District and City staff cannot promptly resolve an issue in dispute; the parties shall promptly convene a meeting of senior party representatives to attempt to resolve the dispute. Either party may request a dispute resolution meeting pursuant to this section by providing written notice to the other party, including a summary of the issue in dispute. District representatives shall be its Board chair or president and another Board member. City representatives shall be the Mayor and City Council President. These senior party representatives shall make reasonable efforts to meet as frequently and as promptly as possible to negotiate the terms and conditions of a resolution. If these party representatives are unable to resolve the dispute through this informal process within a reasonable period, either party may pursue any remedy it may have under law or equity.

(c) The dispute resolution process described above shall be limited to material disputes regarding matters related to Transfers, expenditures from the Water Supply Development Fund, changes in City's Kings River Supply, revisions of this Agreement pursuant to Section 13(d), City's Friant Supply, changes proposed for **Exhibits B or C**, calculation procedures for fees for Out Of Season Deliveries and Rescheduling Fees, and similar matters.

(d) In cases where a dispute arises between the parties that, if unresolved, may result in imminent danger to the public, health, safety or welfare, the parties shall not be obligated to engage in dispute resolution pursuant to this Section 19.

20. Defense of Agreement. In the event of litigation this Agreement, the parties shall cooperate to provide a joint defense of the litigation. Each party shall bear its own costs of such litigation, including attorneys' fees and expert witness fees.

21. No New Agency. This Agreement is not intended to create a new joint powers authority or other entity. Each party shall conduct itself under this Agreement in good faith, using its diligent best efforts to comply with this Agreement and to achieve the objectives of the parties set forth herein. Each party shall make its personnel and resources reasonably available as required to achieve the purposes of this Agreement.

22. Approvals. Except as expressly provided in this Agreement, compliance with all legal/regulatory requirements and governmental or other third party restrictions on the use or delivery of City's Surface Water to it City water users shall be the responsibility of City. District shall be excused from delivering any water supply under this Agreement if, by so doing, District would become subject to additional legal requirements or third party restrictions imposed on deliveries of water to City's water users.

23. Entire Agreement. This Agreement and each of the exhibits referred to herein, which are incorporated by this reference, constitute the entire agreement between the parties pertaining to the subject matter hereof and supersede all prior and contemporaneous agreements and/or obligations concerning these obligations which are merged into this Agreement. Each party has made its own independent investigation of the matters settled and is not relying upon any representation not specified herein.

24. Applicable Law. This Agreement shall be construed under and shall be governed by the laws of the State of California. Any action to interpret or enforce any aspect of this Agreement shall be brought in the California Superior Court of Fresno County, California. City and District hereby expressly waive any right to remove any action to a county other than Fresno County as permitted pursuant to California Code of Civil Procedure Section 394.

25. Construction of Agreement. This Agreement is the product of negotiation and preparation by and among each party hereto and its attorneys, and the parties agree that this Agreement shall not be deemed to have been prepared or drafted by any one party. Accordingly, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement.

26. Modification of Agreement. No supplement, modification, waiver, or amendment with respect to this Agreement shall be binding unless executed in writing by the party against whom enforcement of such supplement, modification, waiver or amendment is sought.

27. Counterparts. This Agreement may be signed in any number of counterparts by the parties, each of which shall be deemed to be an original, and all of which together shall be deemed one and the same instrument. Facsimile or other electronic signatures shall be binding.

28. Further Acts. The parties shall reasonably cooperate with each and take such further actions as may be necessary, including the execution of all necessary further documents, to carry out the purpose and intent of this Agreement. Each of the parties shall diligently and in good faith proceed to negotiate such other agreements as may be necessary to implement this Agreement.

29. Binding Effect. This Agreement shall be of binding legal effect only when it has been executed by all of the parties. No rights or duties under this Agreement may be assigned or delegated by a party without the express written consent of the other party, which may be withheld in the sole and absolute discretion of such other party. Subject to the foregoing, this Agreement shall be binding upon and inure to the benefit of the successors and assigns of the parties.

30. Notice to Parties. Any notice or other communication given under the terms of this Agreement shall be in writing and shall be given personally, by facsimile or by certified mail, postage prepaid and return receipt requested. Any notice shall be delivered or addressed to the parties at the addresses or facsimile numbers set forth below or at such other address or facsimile numbers as shall be designated by notice in writing in accordance with the terms of this Agreement. The date of receipt of the notice shall be the date of actual personal service or facsimile transmission with written confirmation of successful transmission, or three days after the postmark on certified mail. All notices required under or regarding this Agreement shall be made in writing addressed as follows:

Fresno Irrigation District 2907 S Maple Avenue Fresno, CA 93725 Attn: General Manager Facsimile No.: 559-233-8227	City of Fresno 2600 Fresno Street Fresno, CA, 93721 Attn: Director of Public Utilities Facsimile No.: 559-498-1304

31. Attorneys' Fees. In the event of any action or arbitration between the parties seeking enforcement or interpretation of any of the terms and conditions of this Agreement, the prevailing party in such action shall be awarded, in addition to damages, injunctive or other relief, its reasonable costs and expenses, including, but not limited to, taxable costs and reasonable attorneys' fees.

32. Cumulative Rights; Waiver. No failure by any party to exercise, and no delay in exercising any rights, shall be construed or deemed to be a waiver thereof, nor shall any single or partial exercise by any party preclude any other or future exercise thereof or the exercise of any other right. Any waiver of any provision or of any breach of any provision of this Agreement

must be in writing, and any waiver by a party of any breach of any provision of this Agreement shall not operate as or be construed to be a waiver of any other breach of that provision or of any breach of any other provision of this Agreement.

33. Severability. Subject to the parties' rights under Section 2 of this Agreement, if any provision of this Agreement is determined by a court of competent jurisdiction to be invalid, illegal or unenforceable, such provision shall be automatically reformed so as to be valid, legal and enforceable to the maximum extent permitted and the balance of this Agreement shall remain in full force and effect notwithstanding such invalidity, illegality or unenforceability.

34. No Third Party Beneficiaries. This Agreement does not create, and shall not be construed to create, any rights enforceable by any person, partnership, corporation, joint venture, limited liability company, district or other form of organization or association of any kind that is not a party. Without limiting the generality of the foregoing, landowners, residents, water users and ratepayers of the parties are not intended to be third party beneficiaries of this Agreement.

35. Force Majeure. Notwithstanding any other provision of this Agreement, neither party shall be liable for any failure to perform resulting from any cause outside the reasonable control of that party. For purposes of this Agreement, routine and emergency repairs and maintenance of the District Water System shall be deemed causes outside of the reasonable control of District (including without limitation the annual shut down of the Enterprise Canal for maintenance), provided that District shall use reasonable efforts to schedule routine maintenance so as to avoid interference with deliveries of City's Surface Water.

//

IN WITNESS WHEREOF, the parties have executed this Agreement to be effective as of the date first above written.

"District"

The Fresno Irrigation District, a California irrigation district

By _____
Ryan Jacobsen, President

By _____
Gary R. Serrato, General Manager

ATTEST:
_____
Secretary

"City"

The City of Fresno, a municipal corporation

By: _____
Ashley Swearengin, Mayor

By _____
Bruce Rudd, City Manager

ATTEST:
Yvonne Spence, CMC
City Clerk

By: _____ 1/11/17
Deputy

APPROVED AS TO FORM:
City Attorney, Douglas Sloan

By: _____ 12/22/16
AMANDA FREEMAN, DEPUTY

ATTACHMENTS:

EXHIBITS

Exhibit A – Monthly Water Supply Utilization Report
Exhibit B – City Water Service Area Map
Exhibit C – Fresno General Plan Map
Exhibit D – Out of Season Delivery Cost Methodology
Exhibit E – Rescheduled Water Cost Methodology

EXHIBIT A

EXHIBIT A

CITY OF FRESNO FMFCD BASINS
MONTHLY REPORT (AC.FT.)
2015-2016

FMFCD BASINS IN FRESNO	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEAR TO DATE
Basin A													
Basin AB													
Basin AC													
Basin AD													
Basin AE													
Basin AF													
Basin AG													
Basin AH													
Basin AJ													
Basin AL													
Basin AO													
Basin AW2													
Basin AZ													
Basin BE													
Basin BF													
Basin BH													
Basin BM													
Basin BO													
Basin BQ													
Basin BU													
Basin BV													
Basin BW													
Basin BZ													
Basin CC													
Basin CL													
Basin CM													
Basin CN													
Basin CO2													
Basin CS													
Basin CW													
Basin CX													
Basin CY													
Basin CZ													
Basin DD													
Basin DH													
Basin EE													
Basin EF													
Basin EG													

CITY OF FRESNO FMFCD BASINS
MONTHLY REPORT (AC.FT.)
2015-2016

FMFCD BASINS IN FRESNO	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEAR TO DATE
Basin EL													
Basin EM													
Basin FF													
Basin GG													
Basin HH													
Basin II1													
Basin II2													
Basin J													
Basin JJ													
Basin K													
Basin KK													
Basin L													
Basin LL													
Basin MM													
Basin N													
Basin O													
Basin OO													
Basin P													
Basin R													
Basin RR1													
Basin RR2													
Basin RR3													
Basin S													
Basin T													
Basin TT													
Basin U													
Basin UU2													
Basin UU3													
Basin Y													
Basin Z													
Basin ZZ													
Fresno's FMFCD Total													

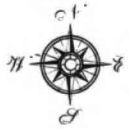
CITY OF FRESNO RECHARGE
MONTHLY REPORT (AC.FT.)
2015-2016

OTHER FRESNO RECHARGE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEAR TO DATE
Leaky Acres													
Woodward Park													
Copper River Country Club													
Big Dry Detention													
Fancher Basin (South)													
Chestnut Ave. Basin													
North Central Basin													
Kearney Basin													
Big Dry Creek West of Winery Ave.													
Delivery System Recharge Fresno													
Copper River Country Club total is the amount exceeding the Phillips Ditch entitlement of 77 ac ft per month (during FID's irrigation season).													
Basin BF Water comes from Chestnut Ave. Basin													
Fresno's Total Recharge													
Fresno's SWTP N/E & T-3													
Fresno's Total Usage													

EXHIBIT B

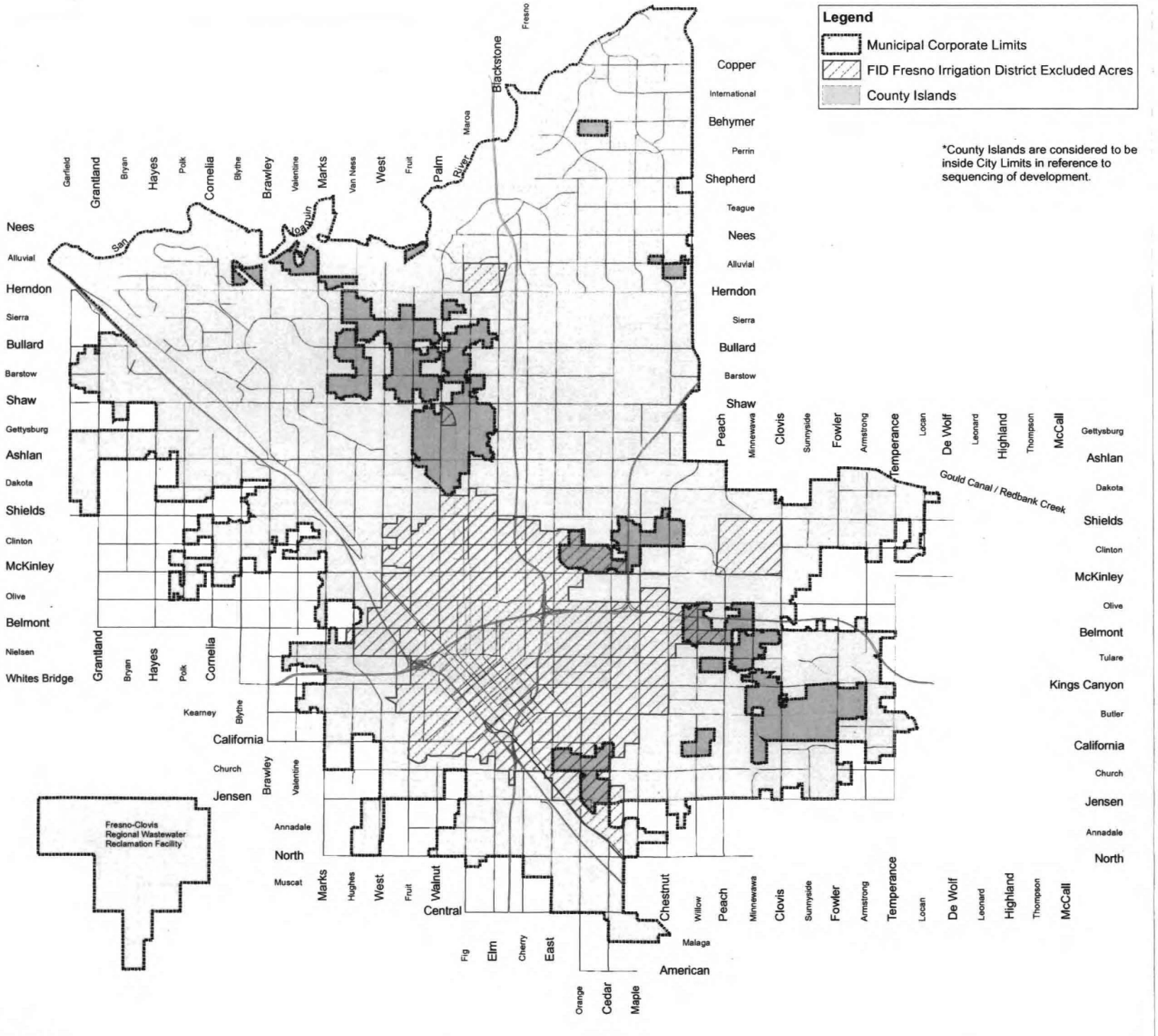
City of Fresno
Water Service Area Boundary
Exhibit "B"
December 13, 2016

"The City's Water Service Area consists of Included Acres and Excluded Acres, and on an annual basis City and District shall revised this Exhibit B map to show the total number of acres in each area as of the first day of March of each year."



Miles

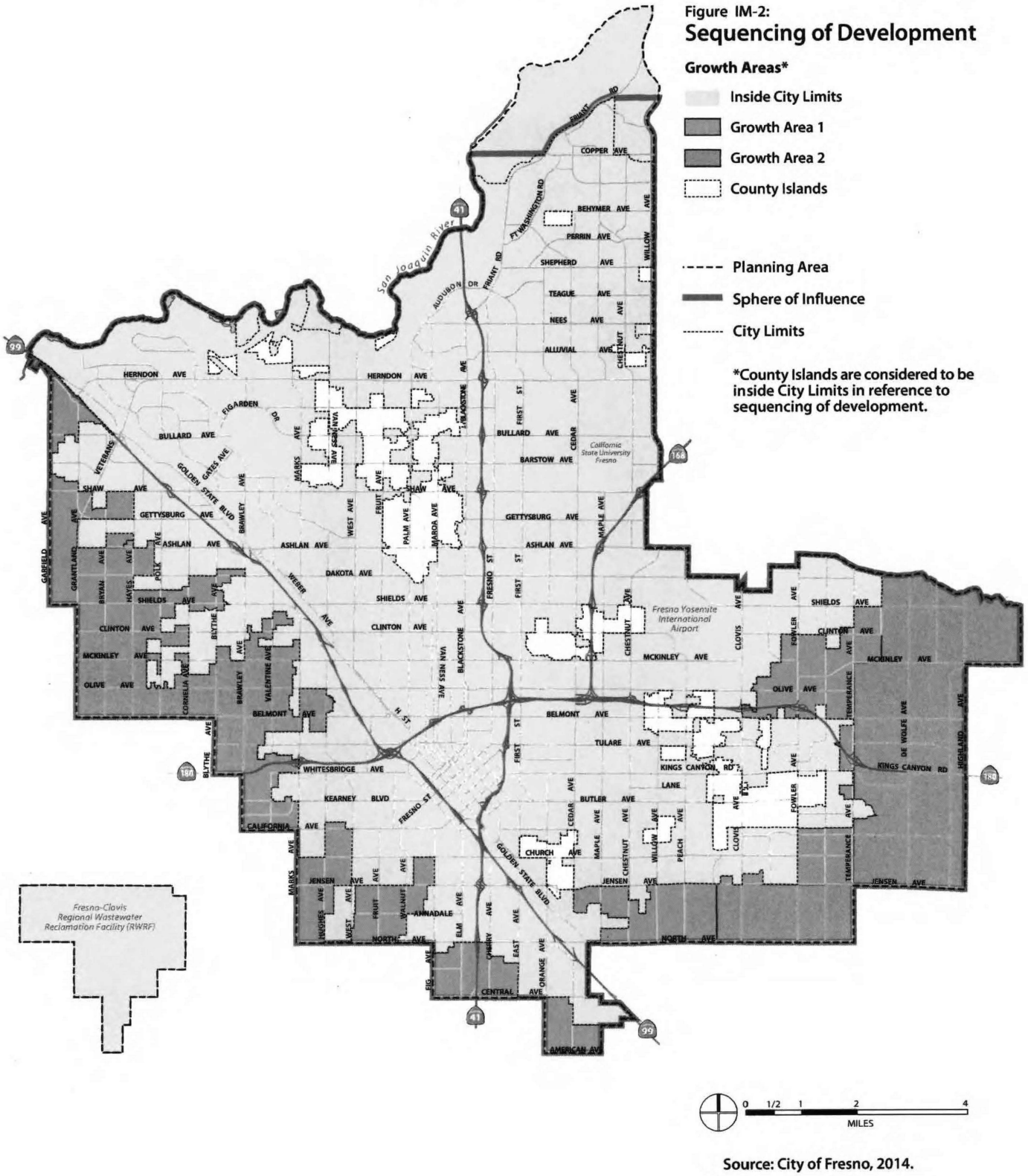
0 0.5 1 2 3



S:\USERS\PET\2016\Thomas Esqueda\Water Service Areas Map\Water Service Area Boundary Ex B Map.mxd

EXHIBIT C

EXHIBIT C



Source: City of Fresno, 2014.

EXHIBIT D

EXHIBIT D

The City will be responsible for paying the District for all costs associated with delivering water Out of Season Deliveries which will include but not limited to:

i. Staff time to deliver water (includes salary wage, labor burden and overhead.
ii. Cost to operate vehicles to operate and inspect the canal system.
iii. Power costs associated with running District's SCADA/Telemetry system, automated gate valves, flow meters, automated trash screens, etc.
iv. Repairs to the canals system which are caused by water running outside the normal irrigation season. Repairs may include but not limited to canal lining, gate replacement, structure replacement, earthwork (grading, dredging, etc.) weed treatment (aquatic or terrestrial), all-weather road maintenance, trash/debris removal, etc.

EXHIBIT E

EXHIBIT E

The Rescheduling Fee for each rescheduling request here under shall be equal to the last Friant carry over charge assessed for a water year prior to the date to the request.

47087

RECORDED IN OFFICIAL RECORDS OF FRESNO COUNTY, CALIFORNIA
AT 41 MIN. PAST 3 P.M.
JUN 24 1974
H. L. MASINI, County Recorder
FEE $

6316 PAGE 31

AGREEMENT BETWEEN FRESNO IRRIGATION DISTRICT AND CITY OF FRESNO FOR EXCHANGE OF RECYCLED WATER

This agreement entered into this 20th day of June 1974, by and between FRESNO IRRIGATION DISTRICT, a public corporation (herein called "District"), and the CITY OF FRESNO, a municipal corporation (herein called "City");

WITNESSETH:

WHEREAS, Fresno Irrigation District is the owner of water rights on the Kings River and a water distribution system for the distribution of irrigation waters for agricultural use within the District and has entered into contracts with the United States for an additional supply of water from the Friant-Kern Canal and for storage in Pine Flat Reservoir on the Kings River for the purpose of supplementing the water available for such use within the District; and

WHEREAS, the City of Fresno is located entirely within the exterior boundaries of the District and is the owner of a water distribution system used by City for delivering water to persons and lands both within and outside its City limits for municipal, industrial and domestic uses and is also the owner of a liquid waste treatment plant located within the District southwest of the city limits which is used for the treatment, percolation, purification, recycling and other disposition of liquid effluent from the City and intends to enlarge and improve said facilities and to produce by such treatment, percolation, purification and recycling, water which is of a quality suitable for agricultural use; and

WHEREAS, the entire area represented by the District and by the City is a water deficient area and the District is in need of additional waters for agricultural use and the City is in need of additional water for municipal, industrial and domestic uses; and

To be recorded without fee on behalf of Fresno Irrigation District. LC Gardner

WHEREAS, the amount of water available to the District for agricultural use may be increased by the use of water recycled by the City as above described and the amount of water available to the City for use in its water distribution system for municipal, industrial and domestic uses may be increased by the exchange of such recycled water for the use by District of additional Kings River and/or Friant-Kern Canal water in that portion of the District northeast of the City; and

WHEREAS, City is desirous of maintaining a water level under its liquid waste treatment plant that will provide for maximum efficiency in the operation of its said plant; and

WHEREAS, a greater beneficial use and more economical utilization of all of the waters available to both the District and to the City can be obtained by the use of such waters as herein provided and both parties believe it is in the best interests of all the landowners and inhabitants within the District and within the City to enter into such an agreement;

NOW, THEREFORE, it is mutually agreed as follows:

1. Approval by United States and State Water Quality Board. Immediately upon the approval of this contract by the parties hereto, it shall be presented to the United States, and also to the California Regional Water Quality Control Board, or its successor agency, for their approval and shall not become effective for any purpose until such approval has been obtained.

This contract shall be at all times subject to all of the terms and conditions of the City Bureau Contract, the District Bureau Contracts and the District Kings River Intra-Association Agreements and to the extent that any agreement contained herein is contrary to or inconsistent with any term or condition of those contracts or agreements, this contract shall be unenforceable. In the event the performance of any agreement contained herein shall become unenforceable or shall be in violation of any Federal,

State or local statute or ordinance or of any decision of any court of competent jurisdiction, the entire contract may be terminated by either party upon written notice mailed to the other party.

2. Definitions. For purposes of this agreement the following words and phrases shall be defined as follows:

(a) "Agricultural use" means the use of water primarily in the production of agricultural crops, including the irrigation of lands and underground water replenishment.

(b) "Recycled water" means water which has been treated and percolated into the underground water supply under the City's liquid waste treatment plant in the southwest portion of the District which is thereafter pumped from said underground water supply.

(c) "City Bureau Contract" means that certain contract between the United States and the City of Fresno providing for water service dated January 12, 1961.

(d) "District Bureau Contracts" means those certain contracts between the United States and Fresno Irrigation District more particularly described as follows:

Contract between the United States of America and Fresno Irrigation District Providing for the Payment of the District's Share of the Cost of Pine Flat Dam and Reservoir Allocated to Irrigation, dated December 23, 1963.

Contract for Operation and Maintenance of Irrigation Storage Space of Pine Flat Reservoir dated December 23, 1963.

Kings River Allocation Contract, dated December 23, 1963.

Conveyance and Covenants in Compromise and Settlement of Fresno Slough Claims, dated April 23, 1965.

Contract between the United States and Fresno Irrigation District Providing for Water Service, dated July 20, 1964.

(e) "District Kings River Intra-Association Agreements" means those certain contracts relating to Kings River and storage in Pine Flat Reservoir more particularly described as follows:

Water Right Indenture, dated May 3, 1927.

Administrative Agreement and Monthly Diversion Schedule dated May 3, 1927.

Agreement Supplementing and Amending Water Right Indenture Dated May 3, 1927, and Supplementing and Amending Administrative Agreement Dated May 3, 1927, Relating to Kings River Water Association, and Amended Monthly Diversion Schedule, dated June 1, 1949.

Agreement Admitting Kings River Water District As a Member of Kings River Water Association and Agreement Re: Centerville Bottoms Schedule, dated September 10, 1963.

Agreement Supplementing and Amending Water Right Indenture Dated May 3, 1927, and Administrative Agreement Dated May 3, 1927, Each as Amended and Supplemented June 1, 1949, Relating to Kings River Water Association, dated September 10, 1963.

3. Agreement to Deliver and Accept Recycled Water. During the term of this agreement City agrees to deliver and District agrees to accept from City recycled water pumped by City from the area under its liquid waste treatment plant in amounts and under the terms and conditions hereinafter provided. When so delivered to District said water shall become the property of the District to be used for agricultural purposes and for underground water replenishment in the southwest portion of the District as the District shall see fit.

4. Water Quality. The City shall not deliver to District or discharge into District's canals any such recycled water which is not of a quality suitable for all agricultural use or which shall be deleterious to plant or animal life and all water so delivered shall meet all the quality standards of the California Regional Water Quality Control Board, or its successor agency, for agriculture and irrigation use and any other federal, state or local agency having jurisdiction or control over water quality standards. City agrees at its expense to make such periodical tests to determine the quality of the water discharged into District's canals at the point where said water is so discharged as may be required by any such board or agency or as may be required by the District's manager and to submit the results

of such tests in writing to the District forthwith after such tests are made. City further agrees that any complaint that said recycled water does not meet the above standards, including but not limited to complaints from any such board or agency, the County of Fresno, any mosquito abatement district or any user of such recycled water, must be corrected and resolved to the satisfaction of District before any further discharge of water into said canals shall be made without the express consent of the District.

5. Exhibit A. A map showing the exterior boundaries of the District, the District's canal system, the city limits of the City of Fresno, the location of City's liquid waste treatment plant site, the exact locations at which City may discharge water into the District's canal system, the type and capacity of the discharge facilities by which each such discharge may be made, the location of observation wells as provided in Paragraph 9, and those portions of the District designated by the parties as the "easterly" and "westerly" portions of the District for purposes of this agreement shall be prepared by the District's engineering department and approved in writing upon said map by the authorized representatives of the District and the City. When so approved said maps shall be incorporated herein by reference as Exhibit A and shall become a part hereof. One duplicate so approved shall be kept in the office of the City and one in the office of the District. Said map may be amended in writing upon said map and reapproved in writing as above set forth.

6. Place and Time of Delivery. City will deliver all such water to the District during the District's irrigation season which may at the election of the District be extended to accommodate the recycled water received under this agreement. Said water delivered by the City to the District shall be discharged by the City into the District's Dry Creek Canal No. 77 and/or Houghton

Canal No. 78 at the locations approved by the District and shown on the map marked Exhibit A and at no other location or locations.

7. Amount to be Delivered. The City shall deliver to the District under this agreement, subject to District's acceptance as provided herein, recycled water pumped by the City, which shall be delivered at a minimum rate of delivery of 100,000 acre feet in each ten-year period of this contract, provided, however, such delivery will not exceed the amount of 30,000 acre feet in any one year except that such maximum may be increased upon agreement between the District's manager and the Director of Public Works of the City. At least 10 days prior to the first day of each calendar month during the term of this agreement City will submit to District in writing a schedule of the daily amount of such water proposed to be delivered to District at each discharge point during that month and the rate of flow indicated in cubic feet per second at which said water will be delivered. Upon receiving said schedule District's manager will approve the amount of such water the District is willing to accept at each said discharge point during each day of that month and thereafter City shall deliver to District the daily amount of such water so approved. Said daily deliveries shall be at a continuous and constant rate of flow during the entire 24 hour period of each said day. In no event shall the discharge into Dry Creek Canal No. 77 in any one month be in excess of one-half of the total amount delivered to District in that month or the discharge into the Houghton Canal No. 78 in any one month be more than two-thirds of the total amount delivered to the District in that month and in no event shall the rate of discharge of water into Dry Creek Canal No. 77 exceed 60 c.f.s. or the rate of discharge into Houghton Canal No. 78 exceed 120 c.f.s. No such discharges shall be made into District's canals until said discharges have been approved

gives immediate notice thereof to the District. In such event City shall use all reasonable effort to immediately restore the delivery of water to the level approved by District's manager as provided in paragraph 7. District's manager may refuse to agree to any such change in schedule or to accept water under such changed schedule if he reasonably determines that such change may result in damage to a District canal or to other property of the District or any other person or will interfere with the operation, alteration, repair or maintenance of the canal into which said discharge is to be made or will interfere with some other operation or function of the District.

9. Ground Water Level. City shall not pump said recycled water from the underground water reservoir in such a manner or to the extent that it will adversely affect the elevation of the water table in the area surrounding its liquid waste treatment plant as determined by the District. Such effect shall not be deemed to be adverse if the ground water level is not lowered below the gradients established by the District as existing on August 1 of the previous year. City agrees to monitor ground water levels in the area from which said recycled water is pumped on a monthly basis by means of observation wells located within an area surrounding its liquid waste treatment plant. The number and location of said wells shall be agreed upon by the City and the District, and when so agreed upon shall be shown on Exhibit A as provided in paragraph 5. Each month at the time City submits its schedule of proposed discharges, City shall supply District with the results of said observations and shall also supply District with a statement of the amounts discharged into District's canals during the previous month. Said schedule and said information shall be given to District upon a standard form approved by District's manager.

10. Construction and Maintenance of Facilities. All

discharge facilities to be used by City in discharging said water into said canals and suitable measuring devices required to measure the amount of water discharged into District's canals shall be constructed by City at its expense according to plans and specifications approved by District and shall thereafter be maintained in good operating and working condition by and at the expense of City. Said discharge facilities shall have a discharge capacity not greater than that shown on said map marked Exhibit A and shall be equipped with positive shut-off controls by which any and all discharges of water into District's canal system may be shut off immediately and at any time. City shall at all times protect said canals and their banks from any damage, injury or erosion at the locations of said facilities into said canals and any such damage or injury at such locations shall be repaired at the expense of City. If City fails to do so District shall be entitled to make said repairs and the expense thereof shall forthwith be reimbursed by City.

11. Use of Water Available to District. In consideration of the agreements of the City herein contained, District agrees that insofar as feasible and practical, it will make available from its Kings River water or from the water received by it under its Bureau Contracts an additional amount of water equivalent to 46% of the water received by it from the City under this agreement for agricultural use and for ground water replenishment in the easterly portion of the District as indicated on Exhibit A. The term "additional amount of water" as above used shall mean water in addition to the amount of water which would have been made available for use in that area if said recycled water had not been received by the District and used in the westerly portion of the District as indicated on Exhibit A. If the District shall determine that the use of said water in said area is not feasible or practicable it may, after discussion with the City, use such

water elsewhere. If in the future it is deemed desirable to do so, City, with the approval of District, may cause the dividing line between the easterly portion of the District and the westerly portion of the District to be moved to the west and the percentage of water to be made available in said easterly portion of the District to be increased in proportion to the increase in the area of land within said easterly portion.

12. District's Representative. Wherever it is provided in this agreement that District's manager shall do and act or exercise his discretion in respect to any particular matter said act and said exercise of discretion may be performed by any other representative of the District to whom such authority shall be delegated either by the District's Board of Directors or by said manager. In exercising his said discretion, the District's manager or his authorized representative shall weigh and balance the equities of the parties in respect to the interests of each and the necessities of District's operations in relation to those of the City. However, in any such case, his decision shall be final.

13. Ownership of District's Water Rights, Canals and Storage. Nothing contained in this agreement shall in any way affect District's ownership of its canal system or of its water right or its right to storage in Pine Flat Reservoir or give City any right or interest therein.

14. Expense of Performance. The performance of all terms and conditions of this agreement to be performed by City shall be at the expense of City and the performance of all terms of this agreement to be performed by District shall be at the expense of District.

15. Indemnity. City agrees to indemnify District and save District harmless of, from and against any loss, cost, expense, liability or attorney's fees incurred by District as the result of

any claim made by any third party because of the City's pumping from the underground water supply as above described or in any way arising out of the execution or performance of this agreement unless such loss, cost, expense or liability is caused by independent negligence on the part of the District in performing the terms and conditions of this agreement on its part to be performed.

16. Successors and Assigns. This agreement shall be binding upon the successors and assigns of the parties hereto provided that City's right to discharge water into District's canal system is not transferable or assignable and shall not pass to any successor in interest without the consent of District. This agreement is not made for the benefit of any person, firm, corporation or public entity not a party hereto and no person, firm, corporation or public entity except a party hereto or its successor or assign shall have any right to enforce said agreement under California Civil Code §1559 or otherwise.

17. Amendments. Except as otherwise provided herein this agreement may not be amended except by the written agreement of the parties hereto.

18. Term, Termination. The term of this contract shall be twenty years from its date, except that it may be cancelled upon mutual agreement between the parties hereto. The contract shall continue in effect after the end of said term except that it may be terminated thereafter by either party upon one year's written notice of such termination. Notwithstanding the foregoing, this contract may be terminated at any time, upon sixty days' written notice by either party, given on and because of substantial breach by the other party, which breach is not repaired or corrected before the end of said sixty-day period.

IN WITNESS WHEREOF, the parties hereto have executed this

agreement the day and year first above written.

FRESNO IRRIGATION DISTRICT

By Winston Strong
President

By Ardys T. Gorder
Secretary

ATTEST:

CITY OF FRESNO

Dahlia Aguilar
City Clerk Deputy

By F. W. Hanley
Chief Administrative Officer

State of California }
County of Fresno } ss.

On this 20th day of June in the year one thousand nine hundred and seventy-four, before me, Paul H. Willison a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared Winston Strong known to me to be the President and Ardys T. Gorder known to me to be the Secretary of the Fresno Irrigation District the corporation that executed the within instrument, and known to me to be the persons who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in said County, the day and year in this Certificate first above written.

OFFICIAL SEAL
PAUL H. WILLISON
NOTARY PUBLIC, CALIFORNIA
PRINCIPAL OFFICE IN
FRESNO COUNTY
My Commission Expires November 19, 1977

Paul H. Willison
Notary Public in and for said County and State

CORPORATION ACKNOWLEDGMENT
Kilner Stationery Co.
1916 Echo

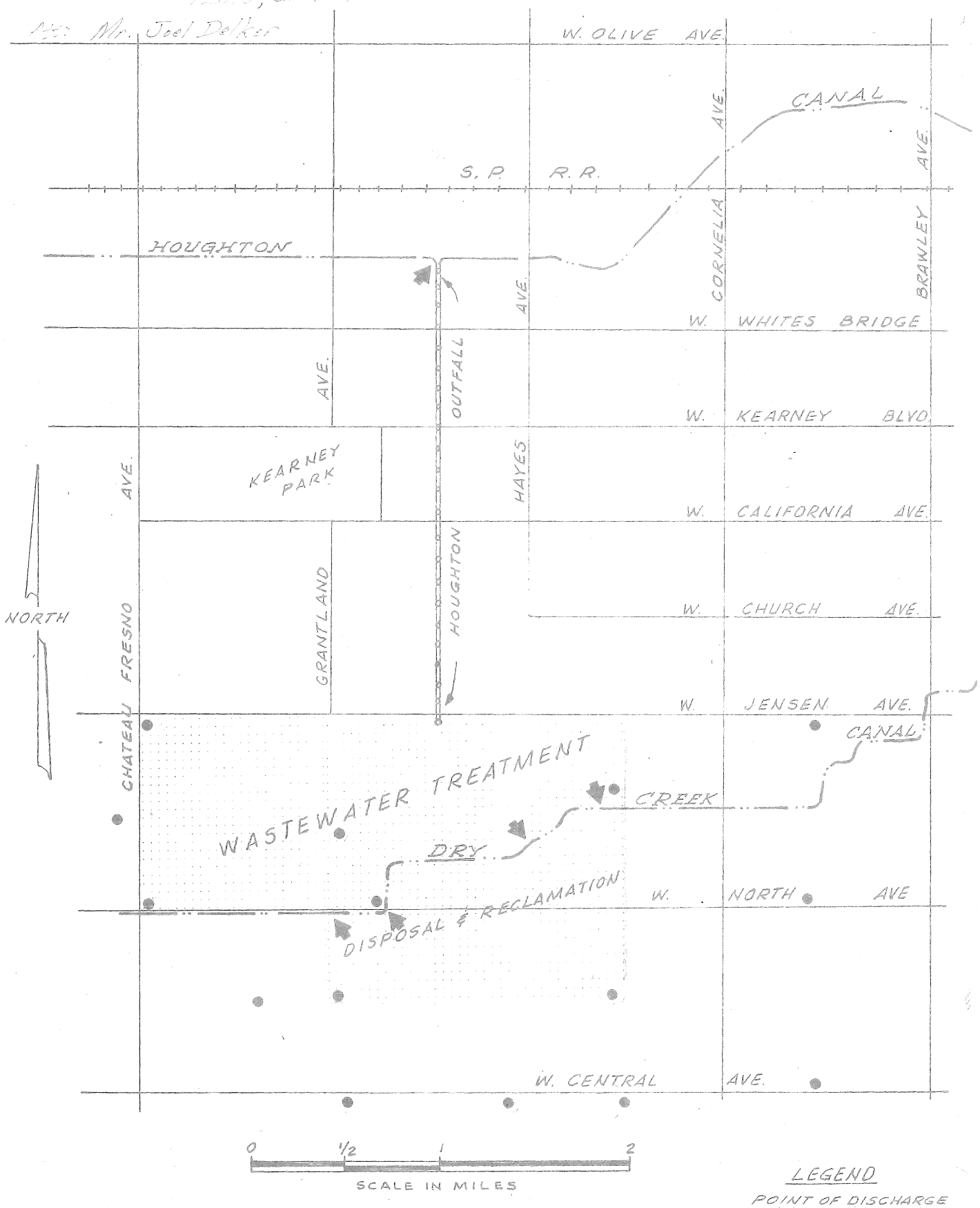
FORM K108

APPROVED AS TO FORM
SPENCER THOMAS, JR., City Attorney

By Richard Macomber
Senior Deputy

Mail to: City of Fresno c/o Waste Water Treatment Div.
5607 W. Jensen Avenue
Fresno, CA. 93706

Attn: Mr. Joel Dolker



LEGEND

POINT OF DISCHARGE City's recycled water into F.I.D. Canal

OBSERVATION WELLS

EXHIBIT A-1

J

Water Shortage Contingency Plan

City of FRESNO
Department of Public Utilities

2020 Water Shortage Contingency Plan

Final

JULY 2021 CITY OF FRESNO



Photo Credit: Downtown Fresno Partnership

WSC

City of FRESNO
Department of Public Utilities

CITY OF FRESNO

Final
2020 Water Shortage Contingency Plan

JULY 2021



Prepared by Water Systems Consulting, Inc.

WSC

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ACRONYMS & ABBREVIATIONS

AMI	advanced metering infrastructure
City	City of Fresno
CWC	California Water Code
DPU	Department of Public Utilities
DRA	Drought Risk Assessment
DWR	Department of Water Resources
FID	Fresno Irrigation District
FMC	Fresno Municipal Code
SWTF	Surface Water Treatment Facility
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water Storage Investment Program

1.1 Introduction

The Water Shortage Contingency Plan (WSCP) is a detailed plan on how the City of Fresno (City) intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time. The WSCP is used to provide guidance to the City's governing body and staff and the public by identifying response actions to allow for responsible management of any water shortage with predictability and accountability. Preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions due to extended drought and catastrophic supply interruptions.

The WSCP describes the following:

1. **Water Supply Reliability Analysis:** summarizes the City's water supply analysis and reliability and identifies any key issues that may trigger a shortage condition
2. **Annual Water Supply and Demand Assessment Procedures:** describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions
3. **Six Standard Shortage Stages:** establishes water shortage levels to clearly identify and prepare for shortages
4. **Shortage Response Actions:** describes the response actions that may be implemented or considered for each stage to reduce gaps between supply and demand as well as minimize social and economic impacts to the community
5. **Communication Protocols:** describes communication protocols under each stage to ensure customers, the public, and government agencies are informed of shortage conditions and requirements
6. **Compliance and Enforcement:** defines compliance and enforcement actions available to administer demand reductions
7. **Legal Authority:** lists the legal documents that grant the City the authority to declare a water shortage and implement and enforce response actions
8. **Financial Consequences of WSCP Implementation:** describes the anticipated financial impact of implementing water shortage stages and identifies mitigation strategies to offset financial burdens
9. **Monitoring and Reporting:** summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation, with results used to determine if additional shortage response actions should be activated or if efforts are successful and response actions should be reduced
10. **WSCP Refinement Procedures:** describes the factors that may trigger updates to the WSCP and outlines how to complete an update
11. **Special Water Features Distinctions:** identifies exemptions for ponds, lakes, fountains, pools, and spas, etc.
12. **Plan Adoption, Submittal, and Availability:** describes the process for the WSCP adoption, submittal, and availability after each revision

This WSCP was prepared in conjunction with the City's 2020 Urban Water Management Plan (UWMP) and is a standalone document that can be modified as needed. This document is compliant with the California Water Code (CWC) Section 10632 and incorporated guidance from the State of California Department of Water Resources (DWR) UWMP Guidebook.

Water purveyor planning for possible water supply shortages has become an increasingly important subject considering the drought conditions over the last several years. The City adopted its first WSCP in 1994 in response to the 1991 Assembly Bill 11X, which mandated all water purveyors with more than 3,000 connections develop a WSCP. The WSCP was revised as part of the 2005 UWMP and adopted by the City in 2008. The WSCP was further refined in 2016 during preparation of the 2015 UWMP and is being updated in 2021 as a standalone document, developed in parallel with the 2020 UWMP. The 2020 WSCP is still based on the original 1994 plan. The revisions are intended to meet new CWC requirements and streamline the plan's usefulness and enable the City to manage the necessary conservation measures to be enacted if a water shortage condition exists. The 2020 WSCP will be reviewed and adopted in conjunction with the 2020 UWMP.

The plan is intended to provide guidance, rather than absolute direction, for City action in response to water shortages and provide the City with options to responsibly manage water shortages.

1.2 Water Supply Reliability Analysis

This section is consistent with CWC Section 10632(a)(1) and describes the key findings of the water supply reliability analysis conducted pursuant to CWC Section 10635, which is presented in **Chapter 7** of the City's 2020 UWMP. As part of the 2020 UWMP, water suppliers must perform long-term (2025-2045) water service reliability assessment to evaluate reliability under normal, single dry year, and five-year consecutive dry year periods and a short-term (2021-2025) Drought Risk Assessment (DRA) to evaluate reliability under a five-year consecutive dry year period. Water supply reliability reflects the City's ability to meet the water needs of its customers with water supplies under varying conditions. The analysis considers plausible hydrological and regulatory variability, infrastructure capacity, climate conditions, and other factors that affect the City's water supply and demand.

The City's current water supply portfolio includes groundwater from the Kings Subbasin, surface water from the Central Valley Project Friant Division through a contract with the United States Bureau of Reclamation (USBR), and surface water from the Kings River through a contract with Fresno Irrigation District (FID), as well as recycled water produced at the Fresno-Clovis Regional Water Reclamation Facility and North Fresno Water Reclamation Facility. The City manages the surface water supplies and groundwater conjunctively such that surface water supplies are used more heavily for direct use and recharge during wet periods and groundwater is used more heavily during dry periods. Over the long term, the City aims to maximize recharge to store water for future use and help groundwater levels recover. Key issues that may create a shortage conditions include reduced surface water availability due to dry hydrologic conditions, reduction in groundwater due to contamination issues, or emergency conditions that reduce the City's water supply.

The water supply reliability analysis concluded that the City's supply portfolio is highly reliable and allows the City flexibility to use a majority of surface water when available in normal years and switch to a majority of groundwater in dry years, when surface water supplies are reduced.

The City is projected to meet potable demands with its existing supplies in all year types through conjunctive use of its groundwater and the City is projected to recharge water in most years to help store water for dry years.

1.3 Annual Water Supply and Demand Assessment

As established by CWC Section 10632.1, urban water suppliers must conduct an Annual Water Supply and Demand Assessment (Annual Assessment) and submit an Annual Water Shortage Assessment Report to DWR, with the first deadline July 1, 2022[1]. The Annual Assessment is an evaluation of the short-term outlook for supplies and demands for the current year and one projected single dry year conditions to determine whether the potential for a supply shortage exists and whether there is a need to trigger a WSCP shortage stage, appropriate response actions, compliance and enforcement actions, and communication protocols.

1.3.1 Key Data Inputs

Key data inputs and their sources for the Annual Assessments are summarized in **Table 1,** and described below**.**

Table 1. Key Data Inputs for the Annual Assessment

KEY DATA INPUT	DESCRIPTION	SOURCE
Customer demands	Estimates current year unconstrained demand plus a modest growth factor	Customer billing data, 2020 UWMP projections, input from City staff
Recharge demands	Estimates current year recharge demand	Surface water allocations, historical recharge, groundwater levels
State mandates	Reflects State orders and mandatory compliance with water use efficiency standards	Executive orders from the governor, orders and policies from the State Water Resources Control Board, input from City staff, or other sources
Surface water allocation	Reflects the City's available surface water supplies for treatment, recharge, and potential exchanges and transfers	Initial allocations from USBR and FID, typically available in April
Groundwater conditions	Reflects status of groundwater conditions	Production data, static water levels, and input from City staff
Infrastructure capacity	Reflects production and distribution capacity due to a variety of factors, including human-caused or natural catastrophic events	Production data, well production capacity, wells impacted by contamination, surface water treatment facilities' capacity, distribution system constraints, input from City staff

[1] For USBR contractors, the assessment is due by July 1 or within 14 days of receiving final USBR water allocation, whichever is later.

1.3.1.1 Customer Demands

Upcoming year customer demands will be estimated based on the previous year's demand, with increases to address: (1) near-term projected growth of customers; (2) unconstrained water use if the previous year included any water use restrictions; and (3) potential water losses not accounted for in the previous year's demand.

1.3.1.2 Recharge Demands

Upcoming year recharge demands will be estimated by (1) availability of surface water not used at the surface water treatment facilities (SWTFs) and (2) projected availability of recharge basins.

1.3.1.3 State Mandates

The City has historically been required by the State to reduce demand regardless of supply reliability at the given time. As described previously, compliance with State mandates for water use efficiency can be declared during drought or in preparation for future droughts, such as in response to the governor's drought declarations in the 2012–2016 drought with subsequent Executive Order B-37-16 and related legislation for Making Conservation a California Way of Life. The City may consider State mandates and mandatory compliance with water use efficiency standards in determining water shortage levels.

1.3.1.4 Surface Water

The City has contracts for surface water with USBR and FID. The available surface water is dependent on hydrology, and in dry years less surface water is available to the City. Final allocations from both USBR and FID are known in April of each year, following the rainy season. In April, the City works with FID to develop a delivery schedule of surface water supplies and submits it USBR. The surface water allocation and delivery schedule will determine the City's operation of its SWTFs for the year, recharge operations, and if it will engage in any exchanges or transfers of supplies. In dry years, when less surface water is available, the City will also plan for increased groundwater use to meet its demands.

1.3.1.5 Groundwater Conditions

Groundwater level and production trends will be compiled and considered by the City staff, or with a hydrogeologist, based on the following actions:

- Plot static groundwater levels on hydrographs to determine trends.
- Plot historic and projected production data to determine trends.
- Compare historic and projected groundwater levels against production data for average and dry years.

1.3.1.6 Infrastructure Capacity

Infrastructure capabilities and overall production will be analyzed to determine if a possible power outage or deficiency may occur or continue in the coming year due to a variety of factors, potentially including human-caused or natural catastrophic events. This analysis may include well replacement, evaluation of wells for possible contamination, SWTFs capacities, and other considerations.

1.3.2 Evaluation Criteria

Staff will use the key data inputs to develop and compare supply and demand projections to determine if water shortage actions may be necessary. A preliminary Annual Assessment template is included in **Attachment 1**. Note that supply projections will incorporate infrastructure constraints and an operational buffer factor of 10% will be added to the demand estimate to account for supply and demand projection uncertainties. The estimated amount of supply available versus the estimated demand will be compared with the water shortage condition triggers presented in **Table 2**. Various trigger conditions, which summarize specific evaluation criteria for each shortage level and can be used to determine a water shortage level, are described in the following sections. Triggers are based on current conditions, and the City will evaluate these triggers and modify them as needed.

A shortage emergency may be declared when it is demonstrated that conditions threaten the ability to provide water for public health, safety, and welfare of the community. Furthermore, compliance with State mandates for water use efficiency can be declared during drought or in preparation for future droughts, such as in response to the governor's drought declarations in the 2012–2016 drought with subsequent Executive Order B-37-16 and related legislation for "Making Conservation a California Way of Life".

Short-term and long-term supply shortages may be caused by constrained production capacity or natural or human-caused catastrophic emergencies, such as: power outages, winter storms, wildfires, earthquakes, structural failures, contamination, and bomb threats. These types of emergencies may limit the City's immediate ability to provide adequate water service to meet the requirements for human consumption, sanitation, and fire protection. Impacts of such emergencies vary in duration. Thus, consumption reduction measures and prohibitions may differ for short-term and long-term conditions or shortages.

1.3.3 Annual Assessment Procedures

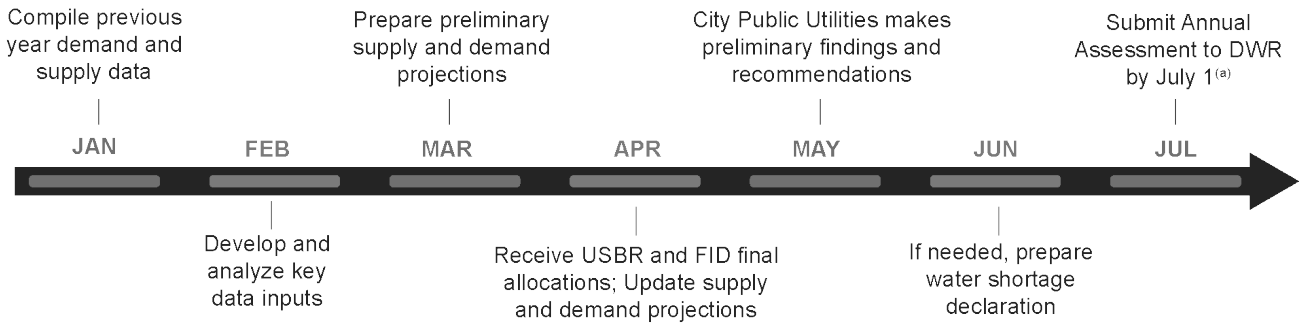
City staff will perform the Annual Assessment following initial allocations from USBR and initial projections for Kings River entitlements by FID, which is typically at the end of rainy season in April. The Annual Assessments are due to DWR by July 1 of each year[2] with the first Annual Assessment Report due to DWR by July 1, 2022. A preliminary annual assessment timeline is shown in **Figure 1.** The City may update the assessment after submission if key data inputs substantially change or other new information becomes available.

[2] For USBR contractors, the assessment is due by July 1 or within 14 days of receiving final USBR water allocation, whichever is later.

Steps to conduct the Annual Assessment are as follows:

1. Staff gathers the key inputs, compiles historical data, and analyzes potential supply and demand gaps.
2. Demand trends, water supply conditions, and production capacity are analyzed.
3. A hydrogeologist may be consulted to provide additional groundwater condition information.
4. City Public Utilities staff will review findings and, if necessary, determine a recommended level of conservation required at the implementation or termination of each stage that will then be brought to the City Manager or Mayor for approval.
5. The City Manager, or designee, will declare and implement the level of conservation required at the implementation or termination of each level, and the declaration shall remain in effect until the City Manager, or designee, so otherwise declares. If a conservation level declaration is made, the declaration shall be published at least once in a newspaper of general circulation.
6. The City will develop and/or implement appropriate communication protocols and applicable response actions.

Figure 1. Annual Assessment Approximate Timeline



[a] For USBR contractors, the assessment is due by July 1 or within 14 days of receiving final USBR water allocation, whichever is later.

1.4 Standard Water Shortage Levels

This section is consistent with CWC Section 10632(a)(2) and describes the City's water shortage levels. New to the 2020 UWMP, water suppliers must now consider six standard water shortage levels. Shortage levels indicate the gap between supply and demand compared to normal-year conditions. DWR standardized six shortage levels to provide a consistent regional and statewide approach to measure water supply shortage conditions. The six shortage levels correspond to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage in supplies compared to demands under normal conditions. However, a water supplier may use its own shortage levels if a crosswalk is included, relating its existing shortage levels to the six standard levels.

The City has elected to keep the previously established four water shortage stages from the 2016 WSCP and add a fifth stage to classify supply shortage greater than 50%. A crosswalk between the City's stages and DWR's standard levels is shown in **Figure 2**.

Figure 2. Water Shortage Stages Crosswalk

City of Fresno Shortage Stage	Percent Shortage Range	Standard WSCP Level	Percent Shortage Level
1	10%	1	10%
2	10 - 25%	2	20%
3	25 - 35%	3	30%
4	35 - 50%	4	40%
5	>50%	5	50%
		6	>50%

Although the water shortage stages are classified by the same percentages as the 2015 UWMP, the City has reevaluated the supply conditions and criteria to enter that stage to better reflect its supply portfolio in comparison to demand. **Table 2** lists the water shortage stages and the conditions that would trigger each stage. Any stage listed within the WSCP may be enacted by the City Manager, or designee, as deemed appropriate based on the water shortage condition.

Table 2. Water Shortage Contingency Plan Levels (DWR 8-1)

SHORTAGE LEVEL	PERCENT SHORTAGE[a]	WATER SHORTAGE CONDITION
0		No water shortage condition. Corresponds with year-round water use measures listed in Section 1.5.1 and demand reduction measures listed for "All" stages in Table 3.
1	0-10%	Stage 1 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **100%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 2 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
2	10-25%	Stage 2 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **90%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 3 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
3	25-35%	Stage 3 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **75%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 4 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
4	35-50%	Stage 4 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **65%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 5 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
5	>50%	Stage 5 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **50%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment.

[a] Shortage levels indicate the gap between supply and demand compared to normal-year conditions. The Annual Assessment incorporates a 10% buffer on top of projected demands for conservative planning.

[b] Water year types were defined 2006 San Joaquin River Restoration Settlement Agreement for USBR allocations and characterized in Section 6.2 of the City's 2020 UWMP.

1.5 Shortage Response Actions

The Fresno Municipal Code (FMC) contains sections on water conservation that are to take place under normal water supply conditions. Regulations in place under normal water supply conditions encourage smart water use and help the City manage its water supply. Some of those regulations include year-round outdoor water schedules; turf type restrictions; turf irrigation methods; and prohibition of willful or negligent water wasting, flood irrigating, washing hardscape with potable water, and frequent draining of pools. Additional details of these regulations can be found in FMC Section 6-520(a) (**Attachment 2**). These restrictions are mandated year-round by the City and must be observed. In addition to the normal restrictions on water usage, the City developed shortage response actions to implement during a water shortage on the City level and consumer level in order to reduce demands that are described in **Section 1.5.2** and detailed in **Table 3**.

In the event of a potential water shortage, the City will evaluate the cause of the shortage to help inform which response actions should be implemented. Depending on the nature of the water shortage, the City can elect to implement one or several response actions to mitigate the shortage and reduce gaps between supply and demand. The City has identified actions that fall within the demand reduction, supply augmentation, operational changes, and additional mandatory restrictions, as stated by DWR. It should be noted that all prohibitions listed for Stage 1 will apply to Stage 2 and, likewise, all restrictions that apply to Stage 2 will apply to Stage 3 and so on, until Stage 5 is reached. Also, due to the City's diverse supply portfolio, Stage 1 imposes only voluntary consumer reductions, while Stages 2–5 all include mandatory reduction actions. If necessary, the City may adopt additional actions not listed here in extreme circumstances.

1.5.1 Year-Round Measures

FMC Section 6-520(a) lists actions that are prohibited at all times, whether or not there is a shortage condition and include:

- Use of potable water to irrigate or water outdoor landscaping in a manner that causes runoff.
- Keep, maintain, operate, or use any water connection, hose, faucet, hydrant, pipe, outlet, or plumbing fixture which is not tight and free from leakage.
- Willfully or negligently waste water as defined in FMC Section 6-501.
- Sprinkle or irrigate any yard, ground, premise, or vegetation except as set forth in the City's Outdoor Water Use Schedule.
- Sprinkle or irrigate any yard, ground, premise, or vegetation, unless watering device used is controlled by a shutoff device or a person is in immediate attendance of the hose or watering device.
- Prohibit use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground, or other hard-surfaced areas, except where necessary for public health or safety.
- Use potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
- Irrigation of ornamental turf on public street medians with potable water, except where the turf serves a community or neighborhood function, there is incidental irrigation by an irrigation system designed to irrigate trees, or the turf is irrigated with recycled water.

- Irrigating outdoor landscapes with potable water during and within 48 hours after measurable rain.
- Serve drinking water other than upon request in eating or drinking establishments, including but not limited to, restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served or purchased.
- Irrigate landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- Automatically changing towels and linens in hotels and motels daily. Operators of hotels and motels shall provide guests the option of choosing not to have towels and linens laundered daily.
- Drain swimming pools more than once every three years, except as necessary to complete structural repairs or to comply with public health standards, as determined by the County Health Officer.
- Prohibit filling new or refurbished swimming pools without obtaining a pool fill permit from the City.
- Refill (top off) established swimming pools except during times when outdoor water use is allowed at the property address pursuant to the Outdoor Water Use Schedule

The City may update these year-round restrictions in the future as needed. For the latest permanent restrictions refer to FMC Section 6-520(a) (**Attachment 2**) and the latest WSCP Resolution (**Attachment 3**).

1.5.2 Demand Reduction

The City has identified a variety of demand reduction actions to offset supply shortages. Demand reduction measures are strategies intended to decrease water demand to close the gap between supply and demand. Demand reduction actions available to the City that may be considered during water shortage conditions are summarized in **Table 3**. Although it is difficult to estimate the volume of savings for each action, the City expects to meet required reductions through a combination of response actions in conjunction with outreach and communication efforts to the extent necessary to mitigate any impacts from a water shortage.

Table 3. Demand Reduction Actions by City (DWR 8-2)

SHORTAGE LEVEL	DEMAND REDUCTION ACTIONS	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP?[a]	ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT[b]
All	Expand Public Information Campaign	Not Applicable	Community outreach includes classroom presentations, outreach educational information, and water tours. Increase communication as drought stages increase.	Not Applicable
All	Improve Customer Billing	Not Applicable	Water bills show customer usage vs. average usage for the customer category. Increase customer notifications of high water use based on advanced metering infrastructure data as drought stages increase.	Not Applicable
All	Offer Water Use Surveys	Not Applicable	Use water leak surveys with all community members.	Not Applicable
All	Provide Rebates for Landscape Irrigation Efficiency	Not Applicable	The City offers rebates for micro-irrigation conversions, soil moisture sensors, smart irrigation controller, and rain sensors to improve efficiencies.	Not Applicable
All	Provide Rebates for Turf Replacement	Not Applicable	The City provides rebates for community members who wish to replace their turf with a drought-resistant garden.	Not Applicable
All	Provide Rebates on Plumbing Fixtures and Devices	Not Applicable	The City offers rebates on a variety of high-efficiency plumbing fixtures, such as washers, toilets, and urinals.	Not Applicable
All	Decrease Line Flushing	Not Applicable	The City uses NO-DES for regular pipe flushing to eliminate discharging water.	Not Applicable
All	Reduce System Water Loss	Not Applicable	The City has a comprehensive system water loss reduction program in place. Increase efforts to correct water system losses as drought stages increase.	Not Applicable
1	Decrease Line Flushing	0 to 100% of shortage gap	For dead-end flushing where the NO-DES truck cannot be used, reduce normal flushing time.	Not Applicable
1	Increase Water Waste Patrols	0 to 100% of shortage gap	Increase monitoring of AMI reporting and communication with customers; Conduct patrols based on public input.	Not Applicable
1	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Voluntary limits: Summer: three days/week Winter: one day/week	No
2	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: three days/week Winter: one day/week	Yes
3	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: two days/week Winter: one day/week	Yes
4	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: one day/week Winter: one day/week	Yes
4	Other — Prohibit use of potable water for construction and dust control	0 to 100% of shortage gap	Prohibit use of potable water for construction, compaction, dust control, street or parking lot sweeping, and building washdowns where non-potable or recycled water is sufficient.	Yes

SHORTAGE LEVEL	DEMAND REDUCTION ACTIONS	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP?[a]	ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT[b]
4	Other — Prohibit vehicle washing except at facilities using recycled or recirculating water	0 to 100% of shortage gap	Prohibit washing cars, boats, trailers, aircraft, or other vehicles, except at commercial or fleet vehicle-washing facilities using water recycling equipment.	Yes
4	Pools and Spas - Require covers for pools and spas	0 to 100% of shortage gap	Require covers for swimming pools when not in use.	No
4	Other	0 to 100% of shortage gap	Prohibit use of potable water for sewer system maintenance or fire protection training without prior approval by the City manager.	Not Applicable
4	Other	0 to 100% of shortage gap	Prohibit use of outdoor misters.	No
5	Landscape — Prohibit all landscape irrigation	0 to 100% of shortage gap	Prohibit outdoor irrigation year-round.	Yes
5	Moratorium or Net Zero Demand Increase on New Connections	0 to 100% of shortage gap	The City will temporarily limit or ban new water service connections within the service area.	Not Applicable

[a] Reduction in the shortage gap is estimated and can vary significantly.
[b] Refer to Section 1.7 for Penalties for Water Wastage.

1.5.3 Supply Augmentation

Given the consistent supply of groundwater through pumping, the City has no immediate plan to augment supply. However, the City could purchase additional USBR or FID surface water, if available. Also, the Cities of Fresno and Clovis have an agreement for interconnection of their potable water systems to provide service during emergencies and other times of hardship in either community. Although these options are discretionary and quantifying their ability to reduce the shortage gap can vary significantly, they are readily available if needed, as indicated in **Table 4**.

Table 4. Supply Augmentation & Other Actions (DWR 8-3R)

SHORTAGE LEVEL	SUPPLY AUGMENTATION METHODS AND OTHER ACTIONS BY WATER SUPPLIER	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP?	ADDITIONAL EXPLANATION OR REFERENCE
1 to 5	Transfers	As Needed	Purchase or exchange available USBR or FID surface water
1 to 5	Other Purchases	As Needed	Interconnection with City of Clovis for use in emergencies

1.5.4 Operational Changes

Operational changes to address a short-term water shortage may be implemented based on the severity of the reduction goal. The City can maximize its supply by implementing operational strategies and demand reduction measures. As part of the Annual Assessment process, the City will consider their operational procedures at the time of a shortage to identify changes that can be implemented to address water shortage on a short-term basis, including but not limited to:

- Utilization of a SWTF to treat pumped groundwater to offset lack of surface water supply
- Expansion of public information campaign to educate and inform customers of the water shortage emergency and required water savings
- Decrease line flushing to only on a compliant basis strictly using the currently operational NO DES truck
- Use water patrols and increase frequency of meter reading by recruiting staff from other departments if necessary
- Offer water use surveys
- Implementing or modifying drought rate structure or surcharge or water emergency tiered pricing, pursuant to the requirements of Proposition 218 and in accordance with California Law
- Prohibit any new permits for hydrant-construction or temporary construction meters.
- Monitoring construction meters and fire hydrant meters for efficient water use in the event that a meter identified wastes water.

- Moratorium on issuing any new building permit unless the: (a) Project is found by the City Manager, or designee, to be necessary for public health, safety. (b) Project will use recycled water for construction. (c) Project will not result in a net increase in non-recycled water use. (d) Project has adequate Conservation Offsets
- Suspending the consideration of annexation to its service area unless the annexation increases the water supply available more than the anticipated demands of the property to be annexed
- Reducing overhead in the short-term and mid-term by deferring non-critical Capital Improvement Plan projects and major maintenance expenditures, and in the long-term by adjusting operational and staffing levels and retail water rate structures to incorporate the reality of lower retail water sales than previously anticipated.
- Decrease in the level or, if need be, even a total interruption in the expenditures for the agency's facility replacement program. Non-critical replacement projects will have little or no impact on the agency or its customers and would only extend the master planned replacement schedule.

1.5.5 Emergency Response Plan

In addition to responding to drought conditions, the City's WSCP can be used to respond to emergency or catastrophic conditions that impact the availability of the City's water supplies, and/or the ability to deliver water within the City's service area. Potential events are listed below:

- Loss of surface water supply
- Loss of groundwater supply
- Area-wide electrical power failure
- Natural disaster — earthquake or flood

In the event of a supply interruption, there are several measures that could be taken that would mitigate the overall negative impacts of a water shortage. The following discussion indicates possible events and actions to maintain water service to the service area.

The City has an agreement with the City of Clovis that discusses an intertie system between the two cities that could provide service during emergencies and other times of hardship in either community. The agreement covers interconnections, including apportionment of capital costs, at two locations: Leonard Avenue at the Gould Canal alignment and Behymer Avenue at Willow Avenue. The Leonard interconnection was constructed and remains in place for emergency uses through manual operation. The agreement also provided for temporary deliveries from Fresno to northern Clovis through the Behymer connection through 2015. However, the Behymer interconnection has yet to be constructed.

The City also cooperates with the County of Fresno's Office of Emergency Services, and the WSCP is included in the County's Disaster Plan. The goal during any emergency scenario is to maintain water supply such that the health and safety of the community is protected.

In the event of contamination of either the surface or ground water supplies, the non-impacted water supply could be used more heavily or the intertie with the City of Clovis could be activated. Additionally, overall demand reduction and the use of other wells or treated surface water would help meet demands.

If a regional power outage were to occur, the City could use backup power generators to operate wells. This measure, in conjunction with demand reduction, could supply sufficient water for health and safety purposes. The City has more than 35 wells with backup power sources. The

City has budgeted for the installation of a backup generator for the Northeast Wastewater Reclamation Facility. The Southeast SWTF and T-3 SWTF are also equipped with backup power generators.

If a natural disaster occurs, in addition to the actions discussed above, the City will isolate any areas of the system that were compromised for emergency repairs and, potentially, use of the intertie with the City of Clovis. Implementing the WSCP could also occur to reduce demands.

For more information on actions during an emergency, refer to the City of Fresno's Risk and Resilience Assessment Report finalized in September 2020 (AARC Consultants, LLC, 2020) and the City of Fresno Emergency Response Plan finalized in March 2020 (AARC Consultants, LLC, 2020).

1.5.6 Seismic Risk Assessment and Mitigation Plan

Refer to Fresno County Multi-Jurisdictional Hazard Mitigation Plan implemented in May 2018, Annex E: City of Fresno attached in **Attachment 4**, for appropriate Seismic Risk Assessment and Mitigation Plan procedures.

1.5.7 Shortage Response Action Effectiveness

The City of Fresno has assessed its overall water reduction by evaluating the water usage trends that were discussed in SBX7-7 in conjunction with the American Water Works Association water loss calculator. See Chapters 5 and 4 of the 2020 UWMP, respectively, for additional information.

The overall decrease of water use per capita and compliance with the 2020 per capita water use target indicate that the reduction measures have been effective in the community. All of the City's customers are metered and the City will use these devices to monitor actual reductions in water use during enacted shortage levels compared to normal year conditions. This data allows the City to determine the effectiveness of the implemented shortage response actions. If reduction goals are not being met, the City Manager, or designee, can make the necessary decisions for corrective action to be taken.

1.6 Communication Protocols

The City's Department of Public Utilities (DPU) currently has a contract with JP Marketing to manage communication and outreach to the customers. The firm's services include strategic planning, creative concepts, public relations, marketing, promotion, research, advertising, media design, copywriting, event creation, and online services. The City also has a public information officer and communications team whose purpose is to communicate water shortage procedures or general utility information effectively and efficiently to the customers.

During normal supply conditions, the Water Division implements informational campaigns to customers that emphasize user-level changes in water use and overall mindfulness of water waste while promoting voluntary conservation. Over the past few years, DPU has increased use of social media to communicate with customers quickly and organically. The City uses Facebook, Twitter, and Instagram to promote water saving tips, notify of shortage conditions, and spotlight DPU employees to foster a sense of community centered around the water supply. The City strives to be proactive in communicating work strategy and conservation efforts with customers.

This WSCP includes a staged plan to communicate the declaration of a shortage stage, inform restrictions, and provide updates during a water shortage emergency. A summary of actions the City could potentially take during a specific shortage stage is outlined in **Table 5**.

Table 5. Communication Protocol During Water Shortage Conditions

SHORTAGE STAGE	ACTION
1	Information posted on the City's website
1	Social media posts (Facebook, Twitter, Instagram, and Nextdoor)
2	Information included in utility bill inserts on a regular basis
2	Promotion of rebates and water conservation services
2	Letters, postcards, and flyers mailed to customers impacted by water use regulations
2	Targeted outreach and technical assistance to highest water users in each use class
2	Engage City councilmembers with resources to share with constituents
3	Increased paid advertising — print, online, radio, TV, streaming, social media, etc.
3	Messaging printed directly on utility bills
3	Press releases to local media (online and print newspapers, TV, radio, etc.)
3	Assembly and promotion of the speaker's bureau for water shortage presentations for neighborhood groups, gardening clubs, homeowners' associations, churches, senior centers, neighborhood associations, business associations, community groups, property management companies, etc.
4	Increased coordination with the local landscaping industry, including water shortage information in their newsletters, publications, and facilities; local wholesale and retail nurseries; and irrigation supply stores
4	Signage posted at nurseries and irrigation supply stores
4	Outreach materials and drought notices mailed to the hospitality industry, including restaurants and lodging

Note: If a water shortage progresses through multiple stages all measures in the previous stage(s) are implemented in addition to current stage actions.

1.7 Compliance and Enforcement

The City has penalties for violation of the water use restrictions in **Table 3**. The City tracks customer usage through advanced metering infrastructure (AMI) in order to enforce water wastage during shortage conditions as detailed in **Section 1.10**. The fines are noted in **Table 6**. Penalties for water waste are based on FMC, Section 6-520(e).

Table 6. Penalties for Water Wastage

INCIDENT MONTH[(a)]	PENALTY AND FINE
1	$0 – Issued a Notice of Water Waste
2	$25
3	$50
4-12	$100
6	If a customer has more than six incident months of water wastage within a one-year period, the City may implement any or all of the following measures: • Require the customer to get a landscape evaluation, lawn water audit, and water budget, as appropriate, in order to learn efficient water use. This work shall be completed at the customer's expense by landscape irrigation auditors certified by the Irrigation Association. • Installation by the City of flow restrictors or termination of water service. • Require a customer to repair any defects in their watering system within 14 days of notice by the City.

Note:

[a] Number of incident months are based on a calendar year.

1.8 Legal Authorities

CWC Section 375 provides the City with the statutory authority to adopt and enforce water conservation restrictions, and CWC Sections 350 et seq. authorize the City to declare a water shortage emergency and impose water conservation measures when it is determined that the City may not be able to satisfy ordinary demands without depleting supplies to an insufficient level.

If necessary, the City will declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1. Once having declared a water shortage, the City is provided with broad powers to implement and enforce regulations and restrictions for managing a water shortage. For example, CWC section 375(a) provides the following:

> *"Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity."*

Water Code Section 375(a). CWC Section 375(b) grants the City with the authority to set prices to encourage water conservation.

Under California law, including CWC Chapter 3.3 and Chapter 3.5 of Division 1, Parts 2.55 and 2.6 of Division 6, Division 13, and Article X, Section 2 of the California Constitution, the City is authorized to implement the water shortage actions outlined in this WSCP. Prior to enacting a shortage level, the resolution providing the Council with authority to enact each level of the WSCP will be adopted. Resolutions to enact the WSCP can be adopted at any meeting of the City Council. The resolution providing the City Manager, or designee, with authority to enact each stage of the WSCP is included in **Attachment 6**.

The City shall also coordinate with any city or county within which it provides water supply services, as listed below, for the possible proclamation of a local emergency under California Government Code, California Emergency Services Act (Article 2, Section 8558).

1.9 Financial Consequences of WSCP

This section is in accordance with CWC Section 10632(a)(8) and describes the financial consequences of implementing the WSCP and potential mitigation strategies. The City anticipates reduced revenue while implementing the WSCP because of decreased water use by its customers and additional costs associated with implementing water use restrictions and associated reduction actions. The incurred cost may vary depending on the shortage stage and duration of the water shortage emergency. The cost of compliance may be tracked when a shortage is declared. The City may track the staff time and resources used to implement the WSCP, including reduced revenue, implementation and enforcement of shortage response actions, and communication and outreach efforts. Impacts of implementing the WSCP include:

- Impact of quantity of water sales on revenue
- Increased staff, salaries, and overtime required for implementing and enforcing restrictions
- Increased costs of new supplies, transfers, or other exchanges

In 2015, the mandatory conservation goal for the City was 28%, however the corresponding revenue reductions were less than 28% due to the City having a two-component water rate structure that includes the fixed “water meter service charge” for all service connections and a volumetric-based “water quantity charge.” Therefore, the reduction in revenues was affected by a lesser percentage than the overall total reduction in water use. In general, revenue impacts specified in the WSCP would be offset with a combination of the following:

- An increase in water commodity and service charges
- A reduction in annual operating expenses due to decreased demands
- Reserves currently earmarked for long range capital
- General tax fund revenues currently earmarked for future capital improvements

Methods to mitigate revenue/expenditure impacts are discussed in detail below.

1.9.1 Drought Rate Structures and Surcharges

At present, the City does not have in place a drought rate structure. The City plans to hire a rate consultant to review existing water rates and, if appropriate, develop new future water rates. As an additional task to this effort, the consultant will review, develop, and recommend a drought rate structure for the City’s consideration. With such a rate structure in place, should a water shortage take place, the City will be able to institute an alternate water rate structure that may

apply and change depending on the stage of drought that the community is experiencing. At this time, there are no details as to how the rate structure will be developed, but conceptually each of the five stages specified in the WSCP would have a water rate increase associated with it.

The use of this type of structure during a drought will minimize expenditure impacts that are incurred during a drought. The effects of the decrease in revenue due to the drought, with a corresponding increase in expenditure, will allow for the City to function without going into debt.

1.9.2 Use of Financial Reserves

The City of Fresno Water System maintains two reserve funding sources that can be used to meet a portion of the utility's revenue requirements during emergency or drought conditions. They are as follows:

- **Water Operating Reserves** – This is cash set aside in the Water Enterprise Fund that provides a "rainy day savings account" for unexpected cash flow shortages and large, unexpected expenses or losses. Normally, these reserves are not intended to be used to make up income shortfalls. However, in an emergency situation, they can be transferred to the Water Rate Stabilization Fund (see below) for transfer back to the Water Enterprise Fund to meet revenue requirements, including debt coverage ratios.
- **Water Rate Stabilization Fund** – Indentures from previous bond issuances required the establishment of the Water Rate Stabilization Fund. These funds can be drawn on to meet a portion of the utility's revenue requirements through unexpected low-revenue periods and may be applied to debt coverage ratio calculations to help avoid technical default of bond covenants and loan agreements.

In addition, the City maintains funding in the Emergency Reserve Fund for the purpose of meeting unforeseen emergencies (see Section 1212 of the City's Charter for more information). This funding may be used by an affirmative vote of at least five members of the City Council upon presentation of a statement declaring the reason for use of the funding. This funding would be used only if the Water System reserves were insufficient to meet revenue requirements.

1.9.3 Other Measures

If the funding mentioned above is not sufficient to compensate for loss of revenue during a water shortage, the City may temporarily suspend components of its operations and maintenance activities.

1.10 Monitoring and Reporting

As described in **Section 1.3**, the City will track its supplies and project demands annually as part of the Annual Water Supply and Demand Assessment, and, if conditions described in **Table 2** are projected, the City will enact its WSCP. Monitoring demands is essential to ensure the WSCP response actions are adequately meeting reductions and decreasing the supply/demand gap. This will help to analyze the effectiveness of the WSCP or identify the need to activate additional response actions.

The City currently has AMI technology to monitor customer water usage and uses its AMI system to automatically enforce demand reduction measures and restrictions. The AMI system is currently set up to monitor and enforce outdoor watering restrictions. The program monitors customer meter flows against an "excessive use" flowrate, which will vary based on the WSCP stage. The system flags customer meters exceeding the excessive use flowrate during a

day/time outside of permitted outdoor watering hours as excessive use and an incident of water waste. If a customer has one or more incidents of water waste during a month, the customer shall be issued a Notice of Water Waste and, if applicable, be charged fines and penalties. The City may expand this monitoring program in the future to monitor other uses beyond outdoor watering restrictions.

The City can also use the detailed water usage data to monitor customers' response and demand reduction due to restrictions for each stage in the WSCP. The many restrictions and prohibitions assigned to each stage in **Table 3** are inherently flexible so the City can implement certain the restrictions, monitor customer usage, and implement additional restrictions if the demand reductions are not sufficient to close the supply and demand gap. The City also intends to provide reporting to the State based on forthcoming regulations for monthly reporting of water production and other water uses, along with associated enforcement metrics.

1.11 WSCP Refinement Procedures

The City intends to use this WSCP as an adaptive management plan to respond to foreseeable and unforeseeable water shortages. The WSCP is used to provide guidance to the City's governing body and staff and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. To maintain a useful and efficient standard of practice in water shortage conditions, the requirements, criteria, and response actions need to be continually evaluated and improved on to make sure the WSCP provides the tools to maintain reliable supplies and reduce the impacts of supply shortages.

This 2020 WSCP accounts for the latest analysis of the City's robust supply portfolio in relation to demand and adjusted percentage reduction stages to reflect a more appropriate supply shortage that should trigger stages. This is a process that should be reevaluated annually and updated as necessary. Potential changes to the WSCP that would warrant an update include any changes to shortage level triggers, changes to the shortage level structure, and changes to the response actions. Any prospective changes to the WSCP would need to be presented at a public hearing; staff would obtain any comments and adopt the updated WSCP. The steps to formally amend the WSCP are discussed in **Section 1.13**.

Potential refinements will be documented and integrated into the next WSCP update. If new response actions are identified by staff or the public, these could be advertised as voluntary actions until they are formally adopted as mandatory.

1.12 Special Water Feature Distinction

CWC Section 10623 (b) requires that suppliers analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code. As listed in **Table 3 and Section 1.5.1**, there are separate requirements for decorative water features — including decorative fountains, lakes, or ponds — and for pools and spas. The City has separate response actions, enforcement actions, and monitoring programs for both decorative water features and pools and spas. Non-pool or non-spa water features may use or be able to use recycled water, whereas pools and spas must use potable water for health and safety considerations. Limitations to pools and spas may require different considerations compared to non-pool or non-spa water features.

1.13 Plan Adoption, Submittal and Availability

This WSCP update was prepared in tandem with the 2020 UWMP. The City held a public hearing and adopted the 2020 WSCP on July 15, 2021. A copy of the published Notice of Public Hearing is included in **Attachment 5** and a copy of the adopting resolution is included in **Attachment 6**. Before the public hearing, notices were published notifying the public of the date and time of the hearing.

Once the 2020 WSCP has been adopted, a copy will be submitted to DWR, the State Library, and the County of Fresno. Also, a hard copy will be made available for public reference at the City of Fresno Department of Public Utilities office at City Hall (located at 2600 Fresno Street) and the Water Division office (located at 1910 E. University Avenue). Additionally, an electronic copy will be uploaded to the City of Fresno website[1] and made available for public reference.

Based on DWR's review of the WSCP, the City will make any amendments in its adopted WSCP, as required and directed by DWR. If the City revises its WSCP after the UWMP is approved by DWR, then an electronic copy of the revised WSCP will be submitted to DWR within 30 days of its adoption.

[1] www.fresno.gov/Government/DepartmentDirectory/PublicUtilities/Watermanagement/importantdocuments.htm

References

AARC Consultants, LLC. (2020). *City of Fresno Department of Public Utilites Risk and Resilience Assessment for the America's Water Infrastructure Act 2018.* Fresno, California.

AARC Consultants, LLC. (2020). *City of Fresno Water Divsion All Hazards Emergency Response Plan.*

Attachment 1
Preliminary Annual Assessment Template

DWR ASSESSMENT TABLE TEMPLATE - EXAMPLE VALUES FOR 2021 SHOWN

City of Fresno
DWR Annual Water Supply and Demand Assessm
Supply and Demand Estimates

Current Year: <YEAR>
Updated: <DATE>

	Current Year	Following Year	
Demand Use Type	**2021**	**2022**	**Notes**
Single Family	60,666	61,272	1% annual increase from 2020
Multi-Family	19,030	19,221	1% annual increase from 2020
Commercial	17,141	17,312	1% annual increase from 2020
Industrial	5,786	5,844	1% annual increase from 2020
Landscape	9,583	8,680	1% annual increase from 2020; Reduced by increased recycled water use
Other	343	347	1% annual increase from 2020
Losses	9,664	9,760	1% annual increase from 2020
Recycled Water	1,912	2,911	Estimates per 2020 UWMP Table 7-4
M&I Demand Subtotal	**124,125**	**125,347**	
Operational Buffer (10%)	12,410	12,530	To account for supply and demand uncertainties
M&I Demand Total	**136,535**	**137,877**	
Groundwater Recharge	-	-	No recharge assumed due to low surface water supply availability
Total Demand	**136,535**	**137,877**	

Supply	**2021**	**2022**	
Groundwater, Sustainable Yield	73,062	73,644	Sustainable groundwater yield per 2020 UWMP Table 6-1
Groundwater, Allocated from Storage	-	-	Groundwater in storage built up over time from recharge and reduced pumping; Not used since supply is greater than demand
USBR Contract Allocation	17,612	19,025	Current Year: USBR Allocation = 20% plus 5,612 AF of carryover Following Year: Average of "Critical" year per 2020 UWMP Table 6-2
FID Contract Allocation	51,580	61,000	Current Year: FID Kings River Allocation = 26% Following Year: Average of "Critical" year per 2020 UWMP Table 6-3
Recycled Water, RWRF	1,802	2,801	Estimates per 2020 UWMP Table 6-6
Recycled Water, NFWRF	110	110	Estimates per 2020 UWMP Table 6-6
Total Supplies	**144,166**	**156,580**	

Supply vs. Demand	**2021**	**2022**
Supply minus Demand (AF)	**7,631**	**18,703**
Supply divided by Demand (%)	**106%**	**114%**

WATER SHORTAGE STAGE TEMPLATE - EXAMPLE VALUES FOR 2021 SHOWN

City of Fresno
DWR Annual Water Supply and Demand Assessment
Water Shortage Stage Comparison

Current Year: <YEAR>
Updated: <DATE>

2021 Water Supplies (AFY)

Supplies	Maximum Available Supplies	Projected Available Supplies
GW, Sustainable Yield	73,062	73,062
GW, from Storage	*Not Used*	
Surface Water	176,055	69,192
Recycled Water	1,912	1,912
Total	**251,029**	**144,166**

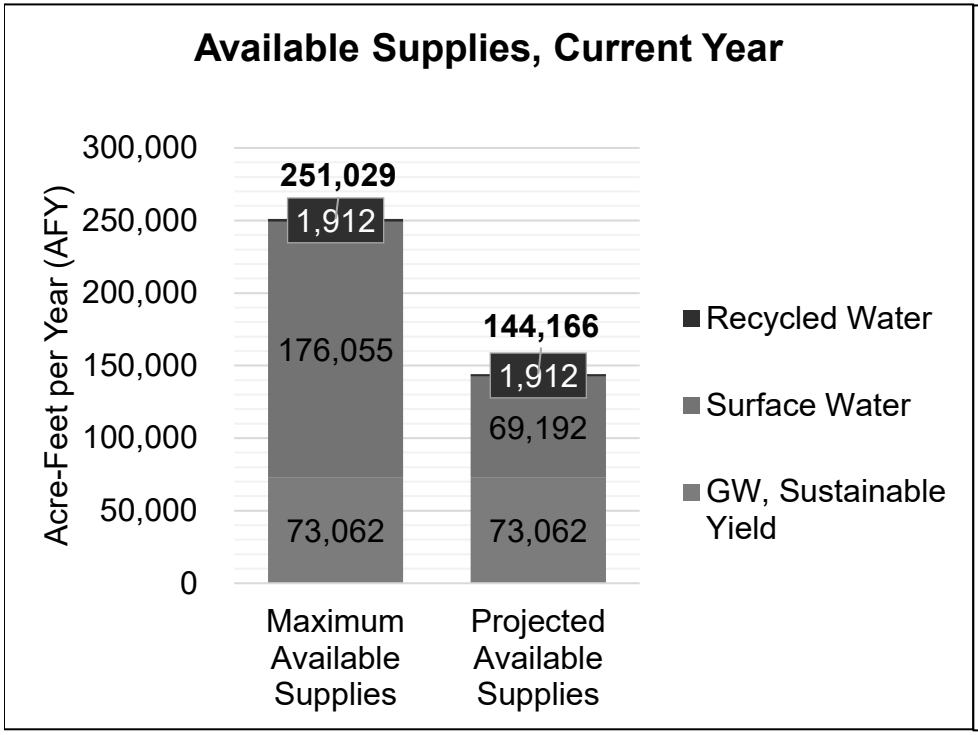
2021 Water Demands (AFY)

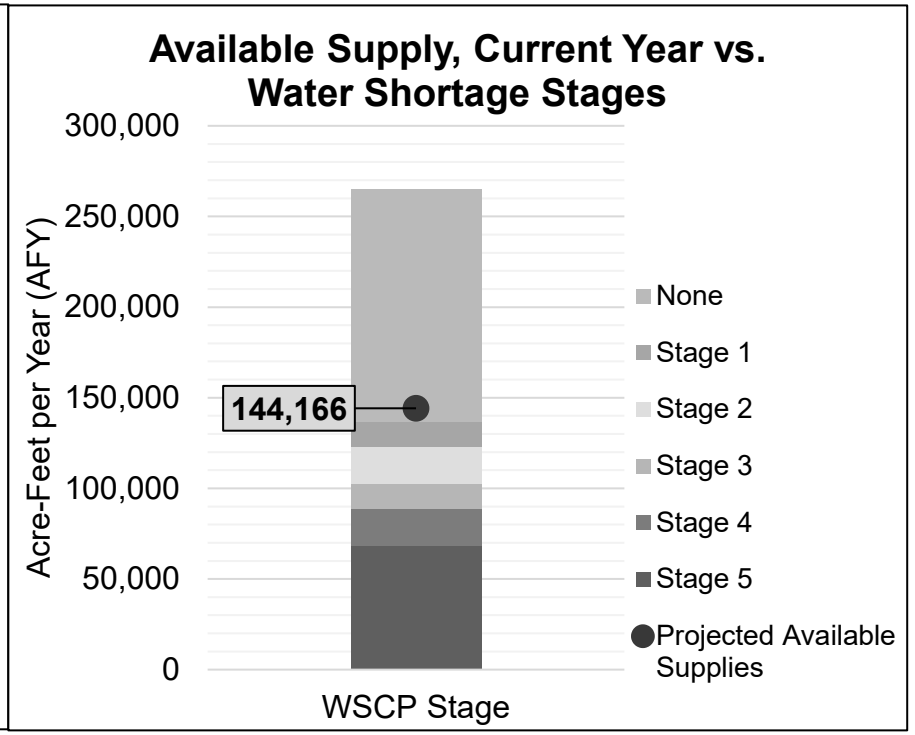
Demand Type	Estimated Demands
M&I	124,125
Buffer	12,410
Retail Subtotal	**136,535**
Recharge	0
Total	**136,535**

Note: Refer to seperate Supply and Demand projections table for assumptions.

Water Shortage Stages

WSCP Stage	Reduction Upper End	Reduction Lower End	(AFY) Upper End	(AFY) Lower End
None				136,500
Stage 1	0%	10%	136,500	122,900
Stage 2	10%	25%	122,900	102,400
Stage 3	25%	35%	102,400	88,700
Stage 4	35%	50%	88,700	68,300
Stage 5		> 50%	68,300	





Attachment 2
City of Fresno Municipal Code Chapter 6-520

SEC. 6-520. - WATER CONSERVATION.

(a) In the use of potable water supplied by the city, no customer shall do or permit any of the following:

(1) Use potable water to irrigate or water outdoor landscaping in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures,

(2) Keep, maintain, operate, or use any water connection, hose, faucet, hydrant, pipe, outlet, or plumbing fixture which is not tight and free from leakage,

(3) Willfully or negligently waste water,

(4) Flood any part of the premises of another,

(5) Sprinkle the premises of another so as to prevent the normal use thereof or unreasonably wet objects thereon which should not be subjected to a spray of water except as naturally caused by the elements or by action of the owner of the object,

(6) Sprinkle or irrigate any yard, ground, premise, or vegetation except as set forth in the City's Outdoor Water Use Schedule,

(i) Annual Exemptions. The following properties may submit an application for a one-year exemption to the Outdoor Water Use Schedule in effect at the time of the application:

a. Properties with multiple addresses, and

b. Properties with turfed or landscaped areas of two acres or larger, and

c. Properties without street addresses.

The owners of such properties shall submit a proposed modified Outdoor Water Use Schedule in writing to the Director or designee for approval or modification. The Director may approve a modified Outdoor Water Use Schedule for with more frequent watering or different watering days than allowed by the Outdoor Water Use Schedule in effect at the time the application for an exemption is submitted for consideration. If the Director determines the proposed exemption will adversely impact system water pressures in the service area, the proposed exemption will be denied. All Annual Exemptions approved by the Director shall automatically expire on December 31 of each year, and the property owners must re-apply for an exemption to the Outdoor Water Use Schedule.

(ii) Short-term Exemptions. The following properties may submit an application for an exemption from the Outdoor Water Use Schedule for a specific time period not to exceed one month.

a. Properties with new lawns not yet established.

b. Properties seeking to use water for a bona fide use, such as solar panel cleaning or other use necessary for health or preservation of property.

The owners of such properties shall submit a proposed modified Outdoor Water Use Schedule in writing to the Director or designee for approval or modification no less than 48 hours before the proposed non-compliant water usage. The Director may approve a modified Outdoor Water Use Schedule that may provide for more frequent outdoor water use or different outdoor water use days than allowed by the Outdoor Water Use Schedule in effect at the time the application for an exemption is submitted for consideration. If the Director determines the proposed exemption will adversely impact system water pressures in the service area, the proposed exemption will be denied. All Short-term Exemptions approved by the Director shall automatically expire on the date set forth on the Short-Term Exemption permit.

(7) Sprinkle or irrigate any yard, ground, premise, or vegetation unless the watering device used is controlled by an shut-off device, or a person is in immediate attendance of the hose or watering device,

(8) Wash any privately owned motor vehicle, trailer, or boat except from a bucket or in a commercial car wash, provided a hose equipped with a shut-off nozzle may be used for a quick rinse without causing water to flow onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures,

(9) Wash or rinse with a hose or watering device any sidewalk, driveway, parking area, tennis court, patio, or any other exterior paved area, except for public health and safety reasons at public gathering places, or

(10) Use potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

(11) Irrigate ornamental turf on public street medians with potable water, except where:

(i) The turf serves a community or neighborhood function, including but not limited to, recreational uses and civic or community events;

(ii) The turf is irrigated incidentally by an irrigation system primarily intended to irrigate trees;

(iii) The turf is irrigated with recycled water.

This prohibition does not include trees and shrubs on public medians, which may be irrigated.

(12) Irrigate outdoor landscapes with potable water during and within 48 hours after measurable rainfall.

(13) Serve drinking water other than upon request in eating or drinking establishments, including but not limited to, restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served or purchased.

(14) Irrigate landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

(15) Automatically change towels and linens in hotels and motels daily. Operators of hotels and motels shall provide guests the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.

(16) Drain swimming pools more than once every three years, except as necessary to complete structural repairs or to comply with public health standards, as determined by the County Health Officer. Residents with private swimming pools shall file a written application for a permit with the City of Fresno Water Division at least 48 hours prior to draining the pool. Any customer whose swimming pool is drained by order of the Department of Health for failure to maintain it properly will also be issued a notice of violation of the City of Fresno Municipal Code. The draining of pools for reasons of health and safety hazards as determined by the City of Fresno Water Division and/or the Department of Health is permitted. The application shall include the results of a pool water test conducted by an independent testing organization which shows a cyanuric acid level above 100 parts per million, total dissolved solids over 2,500 parts per million, or calcium over 450 parts per million, or stating the nature and duration of repairs to be made and the date on which the pool will be drained.

(17) Fill newly constructed or refurbished swimming pools without a pool fill permit from the City of Fresno Water Division.

(18) Refill (top off) established swimming pools except during times when outdoor water use is allowed at the property address pursuant to the Outdoor Water Use Schedule.

(b) Notwithstanding the foregoing, drip irrigation of community and residential fruit and vegetable gardens and fruit tr permitted any day of the week; for this subsection, "drip irrigation system" means a non-spray, low-pressure, and lc volume irrigation system in good working order utilizing emission devices with a flow rate of less than four gallons p hour, designed to slowly apply small volumes of water at or near the root zone of plants, when used primarily for ir of fruit and vegetable gardens and fruit trees; should any city water customer be cited for excessive water use, the customer may contact the Water Division and request an exemption from the Outdoor Water Use Schedule for a hc community garden that is irrigated with a drip irrigation system. Upon being contacted, the Water Division will sche visit to the subject property to inspect the garden and the drip irrigation system used to irrigate the garden. The Wa Division shall grant an exemption for home or community garden with the following conditions:

(1) The property must limit water use to an amount equal to, or less than, the average monthly water use for the single-family residential customer class. The monthly average water use for the single-family residential customer class is printed on monthly utility bills issued by the City.

(2) The drip irrigation system must be in good working order with no leaks, line breaks, or other deficiencies that will contribute to water waste. Exemptions shall be withheld until corrective action is taken to address system deficiencies.

(3) The drip irrigation system must be used primarily for the home or community garden, and not for other landscape on the property- Exemptions shall be withheld until the drip irrigation system for the home or community garden can be isolated from other landscape on the property.

(4) No flood irrigation will be allowed with the drip irrigation system, and water must remain on the subject property with no runoff to sidewalks, driveways, pavements, or adjacent properties.

(5) The home and community garden exemption is provided exclusively for drip irrigation systems only, and will not be allowed for other types of irrigation systems.

(6) This exemption shall only apply to properties ¼ acre or smaller. For properties greater than ¼ acre, the property owner may apply to the Director or designee for an exemption.

(c) Lawn sprinkling systems shall be properly designed, installed, maintained, and operated to prevent waste of water.

(d) Repealed.

(e) The provisions of this section are conditions of service.

(1) Each incident of Excessive Use as defined in section 6-501, or use of water inconsistent with the provisions of this section, is an incident of water waste.

(2) If a customer has one or more incidents of water waste during a month, as observed by City staff or as recorded by the City's water meter reading system, the customer shall be issued a Notice of Water Waste and, if applicable, charged a fine as set forth in the Master Fee Schedule. Such fines shall be added to the customer's monthly utility bill and shall be due and payable with that utility bill and subject to the FMC 6-106, Late Payment of Municipal Service Bills.

(3) Incident counts for water waste shall be monitored, recorded, documented and enforced on a monthly basis during the calendar year for individual customers, and the incident counts shall be reset January 1 of each year.

(4) If a customer performs or permits incidents of water waste more than six consecutive months, the water service to the customer may be terminated unless in the opinion of the Director such termination would result in an unreasonable risk to the health and safety of persons. If water service is terminated for

successive incident of water waste, the water service may only be restored upon execution of an agreement with the customer to adhere to the conditions of service described in this section.

(5) If a customer objects to a fine imposed for an incident of water waste pursuant to this section, the following appeal process may be used.

Step 1.

(a) Within thirty days of issuance of the utility bill including the fine, the customer may contact the Water Conservation Program to appeal an incident of water waste resulting in a fine with the staff person who initiated the enforcement measure. The staff person shall gather the facts about the incident.

(b) The customer may provide staff with evidence there was no incident of water waste, or of a bona fide reason for the incident of water waste, including evidence of a water leak, or another reasonable justification for the water use, within ten business days of the customer's first communication with the Water Conservation Program regarding the alleged incident of water waste.

(c) Within ten business days of the initiation of an appeal, staff shall provide the customer with documentation demonstrating the incident of water waste, if applicable.

(d) The staff will provide the facts and evidence related to the appeal to the Water Conservation Program Supervisor, who will determine whether to rescind the enforcement measure. The Water Conservation Program Supervisor will provide a written decision to the customer within fifteen business days of the customer's appeal, or receiving any applicable evidence from the customer, whichever comes later.

Step 2. If the customer is not satisfied with the decision of the Water Conservation Program Supervisor, they may appeal to the Director or designee within ten business days of the date of the Water Conservation Program Supervisor's decision. The Director or designee shall review the appeal and any evidence the customer previously submitted, and provide a written decision within thirty days of receiving the appeal.

Step 3. If the customer is not satisfied with the decision of the Director of Public Utilities, the customer may appeal to the City's Administrative Hearing Officer in the manner provided in Chapter 1, Article 4 of this code. Such decision shall be final.

(Orig. Ord. 4481; Am. Ord. 6486, 1964; Am. Ord. 73-120, § 6, eff. 8-16-73; Am. Ord. 77-99, § 1, eff. 9-23-77; Am. Ord. 78-74, §§ 1, 2, eff. 5-26-78; Am. Ord. 80-115, § 149, eff. 8-8-80; Am. Ord. 89-48, §§ 1, 2, eff. 4-18-89; Am. Ord. 89-77, § 1, eff. 6-7-89; Am. Ord. 89-102, § 1, eff. 9-22-89; Am. Ord. 90-72, § 1, eff. 8-24-90; Am. Ord. 90-97, § 1, eff. 10-12-90; Am. Ord. 91-104, § 1, eff. 10-18-91; Am. Ord. 91-112, § 1, eff. 11-22-91; Am. Ord. 93-14, § 1, eff. 2-23-93; Am. Ord. 93-20, § 2, eff. 4-30-93; Am. Ord. 2015-13, § 1, eff. 5-21-15; Am. Ord. 2015-29, § 1, eff. 8-27-15; Am. Ord. 2017-56, § 3, eff. 11-19-17; Am. Ord. 2018-45, § 1, eff. 8-10-18; Am. Ord. 2019-011, § 3, eff. 5-31-19).

Editor's note— The provisions in subsection 6-520(e) regarding the enforcement program for incidents of water waste are effective January 1, 2018.

Attachment 3
Water Shortage Resolution

RESOLUTION NO. 2019-073

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO AMEND THE WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act requires the City of Fresno (City) to describe its water conservation measures within its Water Shortage Contingency Plan (WSCP);

WHEREAS, the City adopted its current WSCP on June 23, 2016, as part of the City's 2015 Urban Water Management Plan (UWMP);

WHEREAS, the City Council adopted amendments to the WSCP on October 12, 2017;

WHEREAS, in response to water conservation mandates from the State of California and to provide flexibility to its customers, the City has prepared further amendments to the WSCP to update water conservation requirements and watering restrictions in different water conservation stages in the City of Fresno.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Fresno as follows:

1. The City hereby adopts the amended Water Shortage Contingency Plan, as attached in Tables 1-3 of Exhibit A herein.

2. Resolution 2018-253 shall be repealed on the effective date of this Resolution.

* * * * * * * * * * * * * *

Date Adopted: 4/11/2019
Date Approved: 4/16/2019
Effective Date: 4/16/2019

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, YVONNE SPENCE, MMC CRM, City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 11th day of April, 2019.

AYES : Arias, Bredefeld, Chavez, Esparza, Soria, Caprioglio
NOES : None
ABSENT : None
ABSTAIN : None

Mayor Approval: April 16th, 2019
Mayor Approval/No Return: N/A, 2019
Mayor Veto: N/A, 2019
Council Override Vote: N/A, 2019

YVONNE SPENCE, MMC CRM
City Clerk

By: Yvonne Spence
Deputy

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

By: Amanda B Freeman 04/18/19
Amanda B Freeman Date
Senior Deputy City Attorney

Attachment:
Exhibit A – Revised Water Shortage Contingency Plan, Tables 1-3

EXHIBIT A

Revised Water Shortage Contingency Plan

Table 1: Stages of Water Shortage Contingency Plan (WSCP)

Stage	Percent Supply Reduction	Water Supply Condition
1	10%	Stage 1 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the second of two consecutive years, the volume of surface water available to the City through USBR and FID is projected to be less than the long-term average and the reduction in supply, averaged over the consecutive years, is equal to 10% or greater, or • Groundwater contamination conditions exists (DDW required the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 10% loss in water production capacity, or • Localized groundwater cones of depression develop exceeding historic low water levels and, to avoid possible litigation with responsible parties of point source contaminant plumes, the City must shut down existing wells that result in a 10% loss in groundwater production capacity, or • A combination of the above mentioned circumstances or a disaster reduced the City's overall water supply or production capabilities by 10% or more. • After having been in a Stage 2 classification, the following water year results in a declaration by the jurisdictional authority in determining entitlements for the respective surface water supply of normal or above normal water deliveries; or the original trigger for a previous higher stage classification has been rectified to a point that is consistent with the above conditions for this stage.
2	10 - 25%	Stage 2 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the third of three consecutive years, the projected volume of surface water available to the City through USBR or FID is less than the long term average and the reduction in supply, averaged over the three consecutive years equals 10% or greater, or • The volume of surface water available to the City through FID is reduced by 25% of the long-term average, or • The volume of surface water available to the City through USBR is reduced by 25% of the long-term average, or • One-year change in average groundwater level in 30 key City wells exceeds 3 feet or two-year change in average groundwater level in 30 key City wells exceeds 6 feet and exceeds historic low groundwater levels, or • Groundwater contamination condition exists (DDW requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 25% loss in water production capacity, or • A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities

Stage	Percent Supply Reduction	Water Supply Condition
		by 25% or more. • After having been in a Stage 3 classification, the following water year results in a declaration by the jurisdictional authority in determining entitlements for the respective surface water supply of normal or above normal water deliveries on the Friant-Kern system; or the original trigger for a previous higher stage classification has been rectified to a point consistent with the above conditions for this stage.
3	25 to 35%	Stage 3 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the fourth of four consecutive years, the projected volume of surface water available to the City through USBR or FID is less than the long term average and the reduction in supply, averaged over the four consecutive years equals 10% or greater, or • The volume of surface water available to the City through FID is reduced by 35% of the long-term average, or • The volume of surface water available to the City through USBR is reduced by 35% of the long-term average, or • One-year change in average groundwater level in 30 key City wells exceeds 5 feet or two-year change in average groundwater level in 30 key City wells exceeds 10 feet and exceeds historic low groundwater levels, or • Groundwater contamination condition exists (DDW requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 35% loss in water production capacity, or • A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities by 35% or more. • After having been in a Stage 4 classification, the following water year results in a declaration by the jurisdictional authority in determining entitlements for the respective surface water supply of normal or above normal water deliveries on the Friant-Kern system; or the original trigger for a previous higher stage classification has been rectified to a point that is consistent with the above conditions for this stage.

Stage	Percent Supply Reduction	Water Supply Condition
4	35 - 50%	Stage 4 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the fifth of five consecutive years, the projected volume of surface water available to the City through USBR or FID is less than the long term average and the reduction in supply, averaged over the five consecutive years equals 10% or greater, or • The volume of surface water available to the City through FID is reduced by 50% of the long-term average, or • The volume of surface water available to the City through USBR is reduced by 50% of the long-term average, or • One-year change in average groundwater level in 30 key wells exceeds 7.5 feet or two-year change in average groundwater level in 30 key City wells exceeds 12 feet and exceeds historic low groundwater levels, or • Groundwater contamination condition exists (DDW requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 50% loss in water production capacity, or • A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities by 50% or more.

Table 2: Restrictions and Prohibitions on End Uses

(#)	Stage	Restrictions and Prohibitions	Additional Explanation or Reference	Penalty, Charge or Other Enforcement
a	1-4	Landscape – Limit landscape irrigation to specific times (Outdoor Water Use Schedule)	See Outdoor Water Use Schedule, Table 2a.	Yes See Table 3
b	1-3	Other	Prohibit car washing except with a bucket only (a hose equipped with a shut off nozzle may be used for a quick rinse)	Yes See Table 3
c	1-4	Other – Prohibit use of potable water for washing hard surfaces	Prohibit use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety	Yes See Table 3
d	1-4	Landscape – Prohibit certain types of landscape irrigation	Prohibit irrigating outdoor landscapes with potable water during and within 48 hours after measurable rainfall	Yes See Table 3
e	1-4	Landscape – Prohibit certain types of landscape irrigation	Sprinkle or irrigate any yard, ground, premise, or vegetation unless the watering device used is controlled by an automatic shut-off device, or a person is in immediate attendance of the hose or watering device	Yes See Table 3
f	1-4	Landscape – Prohibit certain types of landscape irrigation	Prohibit using potable water to irrigate or water outdoor landscaping in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures	Yes See Table 3
g	1-4	Landscape – Prohibit certain types of landscape irrigation	Prohibit irrigation of ornamental turf on public street medians with potable water, except where the turf serves a community or neighborhood function, it's irrigated incidentally by an irrigation systems designed to irrigate trees, or the turf is irrigated with recycled water	Yes See Table 3

h	4	Other	Prohibit car washing	Yes See Table 3
i	1-4	Other – Restaurants may only serve water upon request	No restaurant, hotel, café, cafeteria, or other public place where food is sold is served or offered for sale, shall serve drinking water to any customer unless expressly requested	Yes See Table 3
j	1-4	Landscape – Prohibit certain types of landscape irrigation	Irrigate landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development	Yes See Table 3
k	1-4	Water Features – Restrict water use for decorative water features, such as fountains	Prohibit use of potable water to clean, fill or maintain decorative fountains, lakes, or ponds unless such water is reclaimed	Yes See Table 3
l	4	Other – Prohibit use of potable water for construction and dust control	Prohibit use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where non-potable or recycled water is sufficient	Yes See Table 3
m	1-4	Other – Prohibit automatic linen service in hotels and motels	Prohibit automatically changing towels and linens in hotels and motels daily. Operators of hotels and motels shall provide guests the option of choosing not to have towels and linens laundered daily	Yes See Table 3
n	4	Other	Prohibit use of potable water for sewer system maintenance or fire protection training without prior approval by the City Manager	No
o	4	Other – Customers must repair leaks, breaks, and malfunctions in a timely manner	Prohibit allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break	Yes See Table 3

p	4	Other – Prohibit vehicle washing except at facilities using recycled or recirculating water	Prohibit washings cars, boats, trailers, aircraft, or other vehicles except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment	Yes See Table 3
q	1-4	Swimming Pools – Prohibit draining swimming pools more than once every three years	Prohibit draining swimming pools more than once every three years, except as necessary to complete structural repairs or to comply with public health standards, as determined by the County Health Officer	Yes See Table 3
r	1-4	Swimming Pools – Limit filling new or refurbished pools by requiring a pool fill permit	Prohibit filling new or refurbished swimming pools without obtaining a pool fill permit from the City	Yes See Table 3
s	1-4	Swimming Pools – limit filling (topping off) established pools to times and days permitted by the Outdoor Water Use Schedule	Prohibit filling (topping off) swimming pools during times when outdoor irrigation is allowed according to the Outdoor Water Use Schedule	Yes See Table 3
t	4	Pools and Spas – Require covers for pools and spas	Require covers for swimming pools when not in use	No
u	4	Other	Prohibit Use of Outdoor Misters	No

Table 2a: Outdoor Water Use Schedule

Stage	Summer (April 1 – October 31)	Summer Outdoor Water Use days	Winter (November 1 – March 31)	Winter Outdoor Water Use days	Outdoor Water Use Times
1	3 days/week recommended	Even addresses: Wednesday, Friday, Sunday Odd addresses: Tuesday, Thursday, Saturday	1 day/week recommended	Even addresses: Sunday Odd addresses: Saturday	Outdoor Water Use allowed 12:00 AM – 9:59 AM & 6:00 PM – 11:59 PM Outdoor Water Use is prohibited all days 10:00 AM – 6:00 PM
2	3 days/week	Even addresses: Wednesday, Friday, Sunday Odd addresses: Tuesday, Thursday, Saturday	1 day/week	Even addresses: Sunday Odd addresses: Saturday	
3	2 days/week	Even: Wednesday and Sunday Odd: Tuesday and Saturday	1 day/week	Even addresses: Sunday Odd addresses: Saturday	
4	1 day/week	Even addresses: Sunday Odd addresses: Saturday	No outdoor water use		

Table 3: Penalties for Incidents of Water Waste

Incident Month	Incident Fine	Enforcement Schedule
1	$0	The first month an incident of water waste is recorded during the calendar year, the City shall issue a Notice of Water Waste to the customer for the incident observed by City staff or as recorded directly by the City's water meter reading system.
2	$25	The second month an incident of water waste is recorded is recorded for a customer during the calendar year, the City shall assess a fine of $25 to the customer, and the fine shall be applied to the customer's monthly utility bill.
3	$50	The third month an incident of water waste is recorded for a customer during the calendar year, the City shall assess a fine of $50 to the customer, and the fine shall be applied to the customer's monthly utility bill.
4	$100	The fourth month an incident of water waste is recorded for a customer during the calendar year, the City shall assess a fine of $100 to the customer, and the fine shall be applied to the customer's monthly utility bill.
5 -12	$100	For the fifth month an incident of water waste is recorded during the calendar year, and every month thereafter for the remainder of the calendar year during which an incident of water waste is recorded, the City shall assess a fine of $100 to the customer, and the fine shall be applied to the customer's monthly utility bill.
After 6	N/A	If a customer has more than six consecutive months of documented water waste incidents, the water service to the customer may be restricted or terminated unless in the opinion of the Director such restriction or termination would result in an unreasonable risk to the health and safety of persons. If water service is terminated for excessive violations of the water waste provisions as defined herein, the water service may only be restored upon execution of an agreement with the customer to adhere to the conditions of service described in this section.

April 12, 2019

Council Adoption: 4/11/19
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR LEE BRAND

FROM: YVONNE SPENCE, MMC
City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of 4/11/19, Council adopted the attached Resolution No. 2019-073, entitled **Amending the City of Fresno Water Shortage Contingency Plan.** Item No. 3-B (3), File ID19-1472, by the following vote:

Ayes	:	Arias, Bredefeld, Caprioglio, Chavez, Esparza, Soria
Noes	:	None
Absent	:	None
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before April 22, 2019. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval

****

Thank you.

APPROVED/NO RETURN: _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 4-16-19
Lee Brand, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes	:	
Noes	:	
Absent	:	
Abstain	:	

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CITY CLERK'S OFFICE

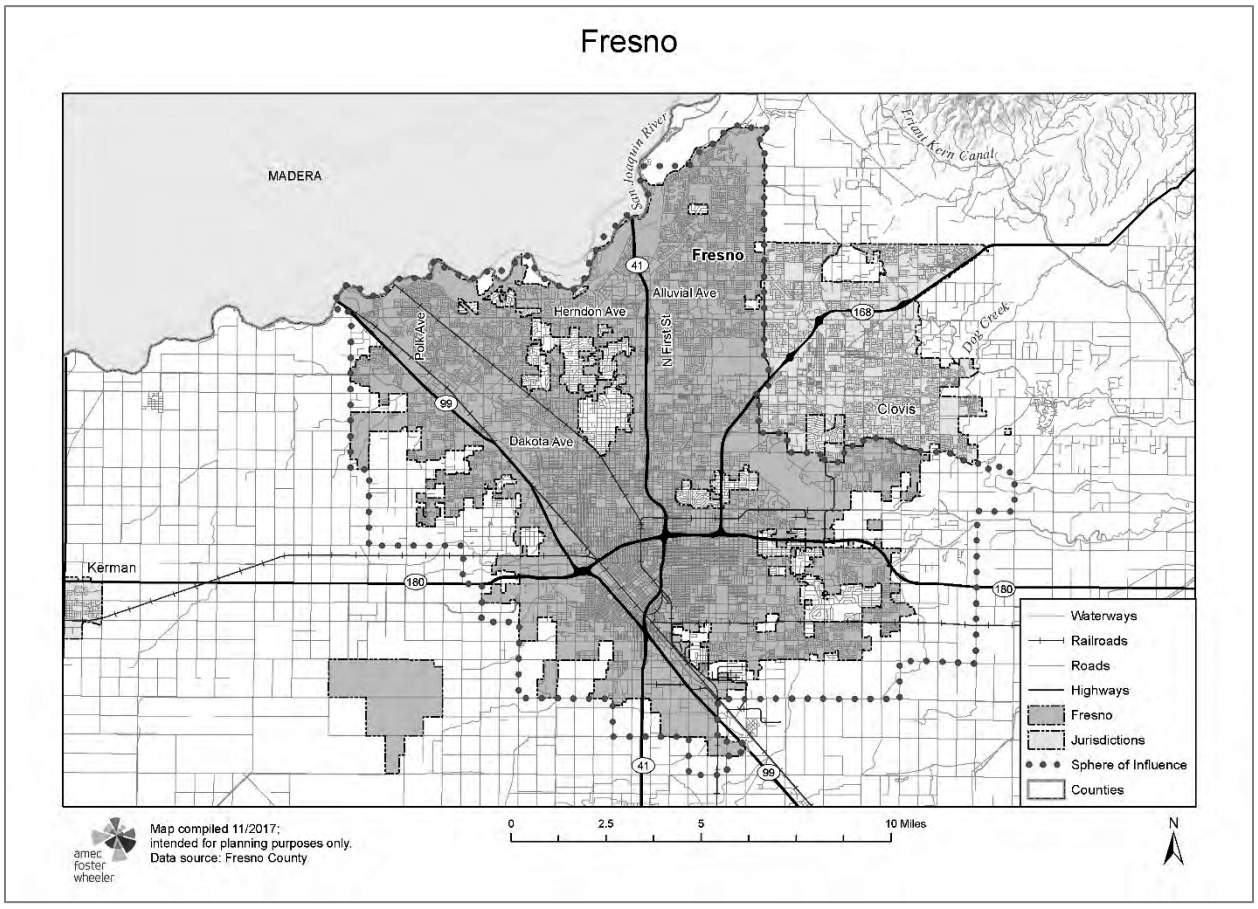
Attachment 4
Fresno County Multi-Jurisdictional Hazard Mitigation Plan, Annex E: City of Fresno

Reference the complete Fresno County Multi-Jurisdictional Hazard Mitigation Plan online:
https://www.fresno.gov/darm/wp-content/uploads/sites/10/2020/12/FresnoCountyHMPFinal.pdf

E.1 Community Profile

Figure E.1 displays a map and the location within Fresno County of the City of Fresno and its Sphere of Influence.

Figure E.1: The City of Fresno



E.1.1 Geography and Climate

The City of Fresno and its Sphere of Influence encompass a 100,400-acre area in central Fresno County. Over the past decade, the City has expanded into the northern, northwestern, and eastern reaches of its Sphere of Influence. Except for the deep channel of the San Joaquin River at the northern boundary of the City, Fresno's topography is generally level and slopes gently to the southwest. The upper San Joaquin River lies at the City's northerly boundary and has carved a deep channel, confining the river between steep bluffs that range from 20 to approximately 100 feet in height.

Fresno has a Mediterranean climate, averaging over 262 sunny days per year and little or no measurable precipitation from June through September. Annual rainfall typically totals 12-14 inches in episodic events lasting up to a few days at most. Fresno's prevailing winds are typically light and from the northwest.

Storms with strong weather disturbances (lightning and very agitated winds) may occur from autumn months through the spring, with the strength of the storm dependent upon temperature gradients between moving weather fronts.

Winter mornings in December and January approach freezing but only rarely reach as low as, or below, 32ºF; winter daytime high temperatures almost always approach or exceed 40ºF. Snowfall is an extremely rare and transient phenomenon; the last recorded snowfall in Fresno was ½ inch on December 20, 1998. The Tule fog, a thick ground fog that settles in the San Joaquin Valley from late fall through early spring, is the leading cause of weather-related accidents in California. In addition to causing visibility issues, "black ice" from precipitated fog may temporarily affect some roadways and bridges during the winter.

Summer daytime peak temperatures are high in Fresno. Some heat waves last over a week with daytime highs well over 100ºF and issuance of health advisories. Summer evenings provide for some cooling of 10-15ºF with the early morning daybreak hours cooling by 20-30ºF, depending on humidity (low humidity allows for more radiant cooling).

Geography and climate combine to create a general accumulation of air pollutants in the San Joaquin Valley (and in the City of Fresno) that occasionally result in unhealthy air quality conditions. Air quality problems are exacerbated by dust storms, human activities (e.g., vehicle emissions and fireplace and wood stove use), atmospheric photochemical processes, and forest fires from local and regional fires. The City has chronically failed to attain some of the national and state ambient air quality standards, but due to the efforts of the California Air Resources Board and the regional San Joaquin Valley Unified Air Pollution Control District, progress toward attainment of ozone (oxidant) and particulate matter standards is being made. Carbon monoxide standards were deemed to have been attained in the 1990s.

E.1.2 History

Development of what today is the City of Fresno began in 1871, when the Central Pacific Railroad chose the Fresno Station for its San Joaquin Valley rail line. The City soon became the County seat and the shipping and distribution hub for the region's agricultural industry. An economic boom across California in the 1880s helped transform Fresno from a village to a city, and helped drive its incorporation in 1885. Today, the City of Fresno is the center of trade, commerce, finance, and transportation for the San Joaquin Valley.

E.1.3 Economy

The most comprehensive economic data available for the City of Fresno comes from the U.S. Census Bureau by way of the American Community Survey (ACS). Select estimates of economic characteristics for the City of Fresno are shown in Table E.1.

Table E.1: City of Fresno's Economic Characteristics, 2015

Characteristic	City of Fresno
Families below Poverty Level	24.4%
All People below Poverty Level	29.8%
Median Family Income	$45,806
Median Household Income	$41,531
Per Capita Income	$19,465
Population in Labor Force	231,332
Population Employed*	198,113
Unemployment	14.3%

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/
*Excludes armed forces

Tables E.2 and E.3 show how the City of Fresno's labor force breaks down by occupation and industry based on 5-year estimates from the 2015 American Community Survey.

Table E.2: City of Fresno's Employment by Occupation, 2015

Occupation	# Employed	% Employed
Management, Business, Science and Arts Occupations	57,374	29.0
Management, Business, and Financial Occupations	*(20,767)*	*(10.5)*
Computer, Engineering, and Science Occupations	*(6,018)*	*(3.0)*
Education, Legal, Community Service, Arts, and Media Occupations	*(20,262)*	*(10.2)*
Healthcare Practitioner and Technical Occupations	*(10,327)*	*(5.2)*
Sales and Office Occupations	49,752	25.1
Service Occupations	41,528	21.0
Production, Transportation, and Material Moving Occupations	26,738	13.5
Natural Resources, Construction, and Maintenance Occupations	22,721	11.5
Total	**198,113**	**100.00**

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/

Table E.3: City of Fresno's Employment by Industry, 2015

Industry	# Employed	% Employed
Educational Services, and Health Care, and Social Assistance	48,557	24.5
Retail Trade	23,337	11.8
Arts, Entertainment, and Recreation, and Accommodation, and Food Services	20,643	10.4
Professional, Scientific, and Management, and Administrative and Waste Management Services	16,742	8.5
Manufacturing	14,869	7.5

Industry	# Employed	% Employed
Public Administration	12,030	6.1
Finance and Insurance, and Real Estate and Rental and Leasing	10,875	5.5
Other Services, Except Public Administration	10,710	5.4
Construction	10,586	5.3
Agriculture, Forestry, Fishing and Hunting, and Mining	10,446	5.3
Transportation and Warehousing, and Utilities	9,476	4.8
Wholesale Trade	7,158	3.6
Information	2,684	1.4
Total	**198,113**	**100.00**

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/

With the depressed real estate and construction market and economic recession toward the end of the 2000-2010 decade, unemployment rates increased to a peak of 18.0 percent in 2010. Since then, the unemployment rate has steadily decreased. The most recent annual data from the State of California Employment Development Department indicates that in 2016 there were 238,400 people in the City of Fresno labor force. Of these, 214,000 were employed; 24,400 were not. The unemployment rate was 10.2 percent.

E.1.4 Population

According to the California Department of Finance, Fresno's population was estimated to be 520,778 in 2016. Select demographic and social characteristics for the City from the U.S. Census Bureau's 2015 American Community Survey 5-year estimates are shown in Table E.4.

Table E.4: City of Fresno's Demographic and Social Characteristics, 2015*

Characteristic	City of Fresno
Gender/Age	
Male	49.2%
Female	50.8%
Median age	30.0
Under 5 years	8.9%
Under 18 years	29.5%
65 years and over	9.9%
Race/Ethnicity**	
White	52.2%
Asian	13.0%
Black or African American	7.9%
American Indian/Alaska Native	1.1%
Hispanic or Latino (of any race)	48.5%
Education	
High school graduate or higher	75.2%
Disability Status	
Population 5 years and over	11.75%

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/
*Based on a 2015 estimated population of 510,451
**Of the 95.4% reporting one race

For information about how some of these demographics affect social vulnerability and how they compare to other Fresno County jurisdictions, California, and the United States, see "Social Vulnerability" in Section 4.3.1 Fresno County Vulnerability and Assets at Risk of the main plan. A more in-depth look at the population of the City of Fresno, including the City's special needs populations, is available in the City of Fresno General Plan 2015-2023 Housing Element commissioned by the City of Fresno Development and Resource Management Department and prepared by MIG, Inc (available at www.fresno.gov/housingelement).

E.2 Hazard Identification and Summary

The City of Fresno's planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Fresno (see Table E.5). In the context of the plan's planning area, there are no hazards unique to Fresno.

Table E.5: City of Fresno—Hazard Summaries

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance
Agricultural Hazards	Limited	Highly Likely	Critical	Low
Avalanche	N/A	N/A	N/A	N/A
Dam Failure	Significant	Unlikely	Limited	Medium
Drought	Significant	Likely	Critical	High
Earthquake	Extensive	Occasional	Critical	Medium
Flood/Levee Failure	Significant	Occasional	Critical	High
Hazardous Materials Incident	Significant	Likely	Critical	High
Human Health Hazards:				
Epidemic/Pandemic	Extensive	Occasional	Critical	Medium
West Nile Virus	Limited	Highly Likely	Negligible	Low
Landslide	Limited	Unlikely	Negligible	Low
Severe Weather				
Extreme Cold/Freeze	Significant	Occasional	Negligible	Low
Extreme Heat	Extensive	Highly Likely	Limited	Medium
Fog	Extensive	Likely	Limited	Medium
Heavy Rain/Thunderstorm/ Hail/Lightning	Extensive	Highly Likely	Limited	Low
Tornado	Extensive	Occasional	Negligible	Low
Windstorm	Extensive	Likely	Limited	Medium
Winter Storm	Extensive	Highly Likely	Negligible	Low
Soil Hazards:				
Erosion	No Data	Likely	No Data	Low
Expansive Soils	No Data	Occasional	No Data	Low
Land Subsidence	Limited	Occasional	No Data	Low
Volcano	Extensive	Unlikely	Negligible	Low
Wildfire	Extensive	Highly Likely	Critical	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Magnitude/Severity
Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid **Significance** Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact

E.3 Vulnerability Assessment

The intent of this section is to assess the City of Fresno's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete during the original outreach process in 2009. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify related vulnerabilities unique to each jurisdiction. In addition, the City of Fresno's HMPC team members were asked to validate the matrix that was originally scored in 2009 based on the experience and perspective of each planning team member relative to the City of Fresno.

Each participating jurisdiction was in support of the main hazard summary identified in the base plan (See Table 4.1). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (See Table E.5). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard, and is based on the City of Fresno's HMPC member input from the Data Collection Guide and the risk assessment developed during the planning process (see Chapter 4 of the base plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table E.5 reflect the hazards that could potentially affect the City. Those of Medium or High significance for the City of Fresno are identified below. The discussion of vulnerability for each of the following hazards is located in Section E.3.2 Estimating Potential

Losses. Based on this analysis, the priority hazards (High Significance) for mitigation include drought, flood/levee failure, and hazardous materials incidents.

- dam failure
- drought
- earthquake
- epidemic/pandemic
- extreme heat
- flood/levee failure
- fog
- hazardous materials incidents
- wildfire
- windstorm

Other Hazards

Hazards assigned a Significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan, and are not assessed individually for specific vulnerabilities in this section. In the City of Fresno, those hazards ranked Low are as follows:

- agricultural hazards*
- human health hazards: West Nile Virus
- landslide
- severe weather: heavy rain/thunderstorm/hail/lightning, tornado
- soil hazards
- volcano
- extreme cold
- winter storm

Note on Agricultural Hazards*: Agricultural hazards are ranked Low in the City of Fresno than for the County overall (ranked High) because very little land in the City is used for agricultural purposes.

Additionally, the City's Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. **Avalanche** is considered Not Applicable (N/A) to the City of Fresno.

E.3.1 Assets at Risk

This section considers Fresno's assets at risk, including values at risk; critical facilities and infrastructure; historic, cultural, and natural resources; economic assets; and growth and development trends.

Values at Risk

The following data on property exposure is derived from the Fresno County 2017 Parcel and Assessor data. This data should only be used as a guideline to overall values in the City as the

information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table E.6 shows the 2017 values at risk broken down by property type for the City of Fresno.

Table E.6: 2017 Property Exposure for the City of Fresno by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value
Agricultural	76	53	$2,887,304	$2,887,304	$5,774,608
Commercial	6,110	24,004	$5,471,778,084	$5,471,778,084	$10,943,556,168
Exempt	1,012	3,881	$0	$0	$0
Industrial	2,575	5,630	$1,420,216,900	$2,130,325,350	$3,550,542,250
Multi-Residential	5,793	52,504	$2,416,885,833	$1,208,442,917	$3,625,328,750
Open Space	1	1	$150,882	$150,882	$301,764
Residential	113,468	117,771	$15,122,142,902	$7,561,071,451	$22,683,214,353
Unknown	2	2	$530,082	$530,082	$1,060,164
Total	**129,037**	**203,846**	**$24,434,591,987**	**$16,375,186,070**	**$40,809,778,057**

Source: Fresno County 2017 Parcel and Assessor data

Since the 2009 Plan, the City of Fresno has experienced notable increases in agricultural, commercial, and residential properties and property values at risk. Compared to improved values from the Fresno County Assessor's Office's 2007 Certified Roll Values, agricultural improved value has increased by 254.2 percent, commercial improved value has increased by 299.8 percent and total residential improved value has increased by 265.8 percent. Part of this dramatic increase in exposure of commercial and residential properties can be attributed to annexations of previously unincorporated County land that have occurred within the last decade.

Critical Facilities and Infrastructure

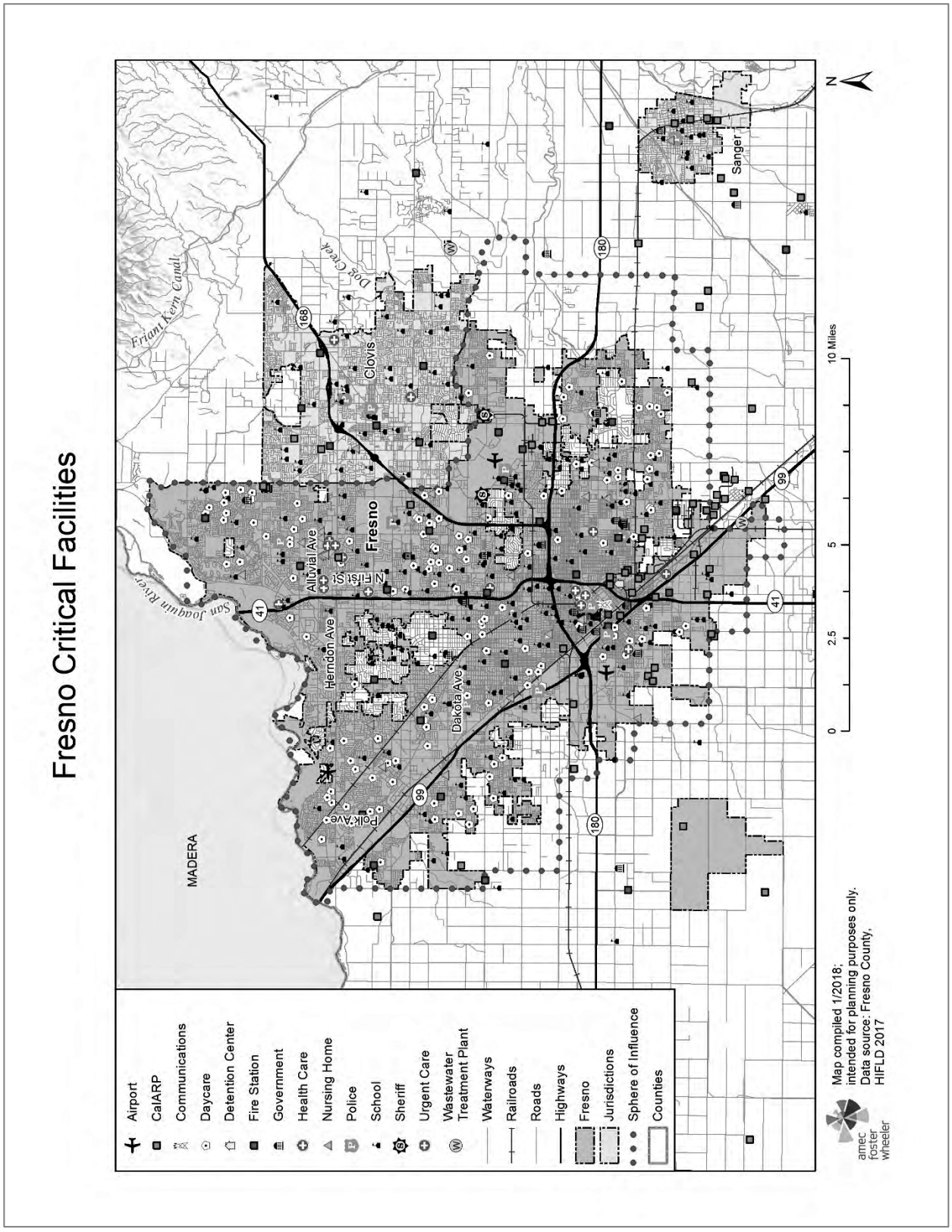
A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. An inventory of critical facilities in the City of Fresno from Fresno County GIS is provided in Table E.7 and mapped in Figure E.2.

Table E.7: City of Fresno's Critical Facilities

Critical Facility Type	Number
Airport	3
Behavioral Health	4
CalARP	28
Colleges & Universities	14
Communications	1
County Government	4
Courthouse	1
Daycare	155
Department of Agriculture	2
Department of Public Health	4
Department of Public Works	1
Department of Social Services	9
Detention Center	4
District Attorney	2
Fire Station	21
General Services	3
Health Care	12
Nursing Home	27
Police	10
School	183
Sheriff	3
Supplemental College	4
Urgent Care	4
Total	**499**

Source: Fresno County, HIFLD 2017

Figure E.2: City of Fresno's Critical Facilities



The list of specific critical facilities and community assets is maintained by the City of Fresno Police Department. The Fresno Urban Area Critical Infrastructure List is considered confidential and may be accessed through the Fresno Police Department Homeland Security Division.

Historic, Cultural, and Natural Resources

Historic and Cultural Sites

The Cultural Resource Facility located on the California State University, Bakersfield campus maintains a database, maps, and descriptive surveys of prehistoric sites in the Fresno area. Details of the locations are kept confidential due to the risk of theft or vandalism of artifacts. The general location of these sites is along the San Joaquin River and its bluffs, where permanent Native American settlements were established near a permanent water supply and seasonal salmon fishery.

The City of Fresno maintains a local official register of historic resources (available from the historic preservation officer in the City's Planning and Development Department). There are approximately 284 properties on the register. Twenty-one of the properties were demolished or destroyed by fire after being placed on the list, and three other properties have been relocated to sites outside the City of Fresno. The local register includes 31 properties that are on the National Register of Historic Places (see Table E.8).

Table E.8: City of Fresno's Properties on the National Register of Historic Places

Property Name	Address	Date Listed
Azteca Theater	836-840 F Street	4/21/2017
Bank of Italy	1015 Fulton Mall	10/29/1982
Brix, H. H., Mansion	2844 Fresno Street	9/15/1983
Einstein House	1600 M Street	1/31/1978
Forestiere Underground Gardens	5021 W. Shaw Avenue	10/28/1977
Fresno Bee Building	1555 Van Ness Avenue	11/1/1982
Fresno Brewing Company Office and Warehouse	100 M Street	1/5/1984
Fresno County Hall of Records	2281 Tulare Street	12/22/2011
Fresno Memorial Auditorium	2425 Fresno Street	5/10/1994
Fresno Republican Printery Building	2130 Kern Street	1/2/1979
Fresno Sanitary Landfill	West and Jensen Avenues	8/7/2001
Holy Trinity Armenian Apostolic Church	2226 Ventura Street	7/31/1986
Hotel Californian	851 Van Ness Avenue	4/21/2004
Kearney, M. Theo, Park and Mansion	7160 Kearney Boulevard	3/13/1975
Kindler, Paul, House	1520 E. Olive Avenue	10/29/1982
Maulbridge Apartments	2344 Tulare Street	5/6/1982
Meux House	1007 R Street	1/13/1975
Old Administration Building, Fresno City College	1101 University Avenue	5/1/1974
Old Fresno Water Tower	2444 Fresno Street	10/14/1971
Pantages, Alexander, Theater	1400 Fulton Street	2/23/1978
Physicians Building	2607 Fresno Street	11/20/1978

Property Name	Address	Date Listed
Rehorn House	1050 S Street	1/8/1982
Romain, Frank, House	2055 San Joaquin Street	1/11/1982
San Joaquin Light & Power Corporation Building	1401 Fulton Street	1/3/2006
Santa Fe Hotel	935 Santa Fe Avenue	3/14/1991
Santa Fe Passenger Depot	2650 Tulare Street	11/7/1976
Southern Pacific Passenger Depot	1033 H Street	3/21/1978
Tower Theatre	1201 N. Wishon Avenue	9/24/1992
Twining Laboratories	2527 Fresno Street	3/26/1991
Warehouse Row	722, 744, and 764 P Street	3/24/1978
YWCA Building	1660 M Street	9/21/1978

Source: National Register of Historic Places, www.nps.gov/nr/

Other historic resources in the City of Fresno include the following historic districts:

- The Porter Tract Historic District (45 homes)
- The Chandler Field/Fresno Municipal Airport Historic District (four historic structures)
- The Wilson Island Historic District (78 homes)
- The Huntington Boulevard Historic Districts (81 homes)

As comprehensive as the City's register may be, it does not include all properties in the City with potential historic or cultural significance. The list is continually being expanded as sites are discovered through routine analysis of proposed development areas and through proposed new listings of historic districts. The pool of potentially historic properties also changes through time, since federal law provides for a 50-year retrospective review, which now encompasses the post-World War II building boom era. Ten properties that were recommended for the City's register but were denied inclusion by the Fresno City Council are still recognized for their historic/cultural significance (heritage properties), which is taken into account when any actions are undertaken on them pursuant to provisions of the California Environmental Quality Act. (Three of these properties have been since been demolished.)

While a detailed assessment of seismic and flood risks for the listed properties in Fresno is currently beyond the available staff resources of the City's Historic Preservation Office, it can be generally assumed that most of the structures have not been seismically reinforced and that their masonry is vulnerable to strong ground shaking.

While many of the structures are in Fresno's old downtown and were built when this area was largely within the 100-year floodplain of the Fresno Stream Group, efforts by the Fresno Metropolitan Flood Control District in conjunction with the U.S. Army Corps of Engineers and the City of Fresno have provided for flood detention structures and ponding basins that have greatly reduced the size and extent of the floodplain in the downtown, helping to preserve these historic resources.

Natural Resource Areas

San Joaquin River Corridor

While the City maintains many community and neighborhood parks, its natural resources are primarily along the San Joaquin River. Owing to the year-round presence of water, the river bottom and bluffs host the richest aquatic and riparian forest biota in the City. It is in this area where migratory waterfowl and federally and state-listed endangered wildlife are most likely be encountered. These species include the valley elderberry longhorn beetle, the giant garter snake, and the American bald eagle (recently recommended for delisting from the National Endangered Species list).

Over past decades, land in the river corridor has been purchased and aggregated by state agencies (Department of Fish and Game, San Joaquin River Conservancy), by nonprofit groups (San Joaquin River Parkway Trust, Fresno Sportsmen's Club), and by the City and County (the City's Woodward Park and Milburn Unit, the County's Lost Lake Park). The ultimate goal of the San Joaquin River Conservancy Plan is to fashion a regional parkway with continuity of wildlife corridors and to manage it for joint recreational, habitat conservation, and floodplain protection uses.

Due to its location, this natural resource area is flood-prone. In some areas, this risk has been increased due to removal of massive amounts of sand and gravel (from mining), which lowered the ground surface over past decades. While the native riparian plants and animals have largely evolved with coping mechanisms for periodic severe flooding, any developed recreation facilities would be at risk. The face of the bluff is also very vulnerable to wildfire because of its vegetative overgrowth and nearly vertical slopes. Fire prevention efforts are difficult here because the soils are too unstable for vegetative removal projects or for irrigation that would keep the plants well-watered.

Vernal Pool Areas

In the northerly parts of the City, outside the river corridor, certain clay soils have the capacity to form impermeable hardpans and layers that do not allow rapid percolation of rainwater. During the rainy season, shallow vernal pools form that are populated by a host of specialized plants and animals. Many species associated with vernal pools are federally and state-listed species (e.g., the California tiger salamander, various types of fairy shrimp crustaceans, orcutt grass, button celery species, meadowfoam, and owl clover). Vernal pools are also heavily utilized by nonlisted species, such as migratory waterfowl, rodents, furbearing predators, and raptors that prey on other animals.

Wildfire is not considered a major risk to these natural communities, because they evolved with dry season fires as a common occurrence (the plants have very resistant seeds and the crustaceans and amphibians go into protected parts of their life cycles such as deep dormancy). Human encroachment through agriculture and land development is the greatest risk to vernal pool areas. If the clay layers are disrupted by "deep ripping" plowing, water cannot accumulate on the surface and the pools will not form. If the land is subjected to year-round irrigation, specially adapted

vernal pool species will be out-competed by other species. Conversion of land to urban development with structures, paving, lawns, pets, and people will destroy vernal pool natural communities.

Economic Assets

The City of Fresno's economic sector includes both private and public entities that have been compiled into clusters in order to identify key economic assets. These ten clusters, known as the Regional Job Initiative (RJI) clusters, are Advanced Manufacturing, Clean Energy, Construction, Food Processing, Healthcare, Info Processing (Call Centers, Logistics, and Distribution), Software Development, Tourism, and Water Technology. Among these clusters are major employers like Saint Agnes, Pelco, Gottschalks, and Ruiz Foods that both boost Fresno's economic growth and provide employment opportunities.

If a disaster struck the City, it could have a severe impact on Fresno's economic assets. Sectors of greatest concern include all the RJI clusters, but in particular Food Processing, which includes the agricultural industry, and Healthcare.

Growth and Development Trends

The City of Fresno is growing at a rapid pace. Its expansion from incorporation in 1885 to the present day (August 2017) is illustrated in Figure E.3. Even more growth is anticipated in the years to come, based on current trends.

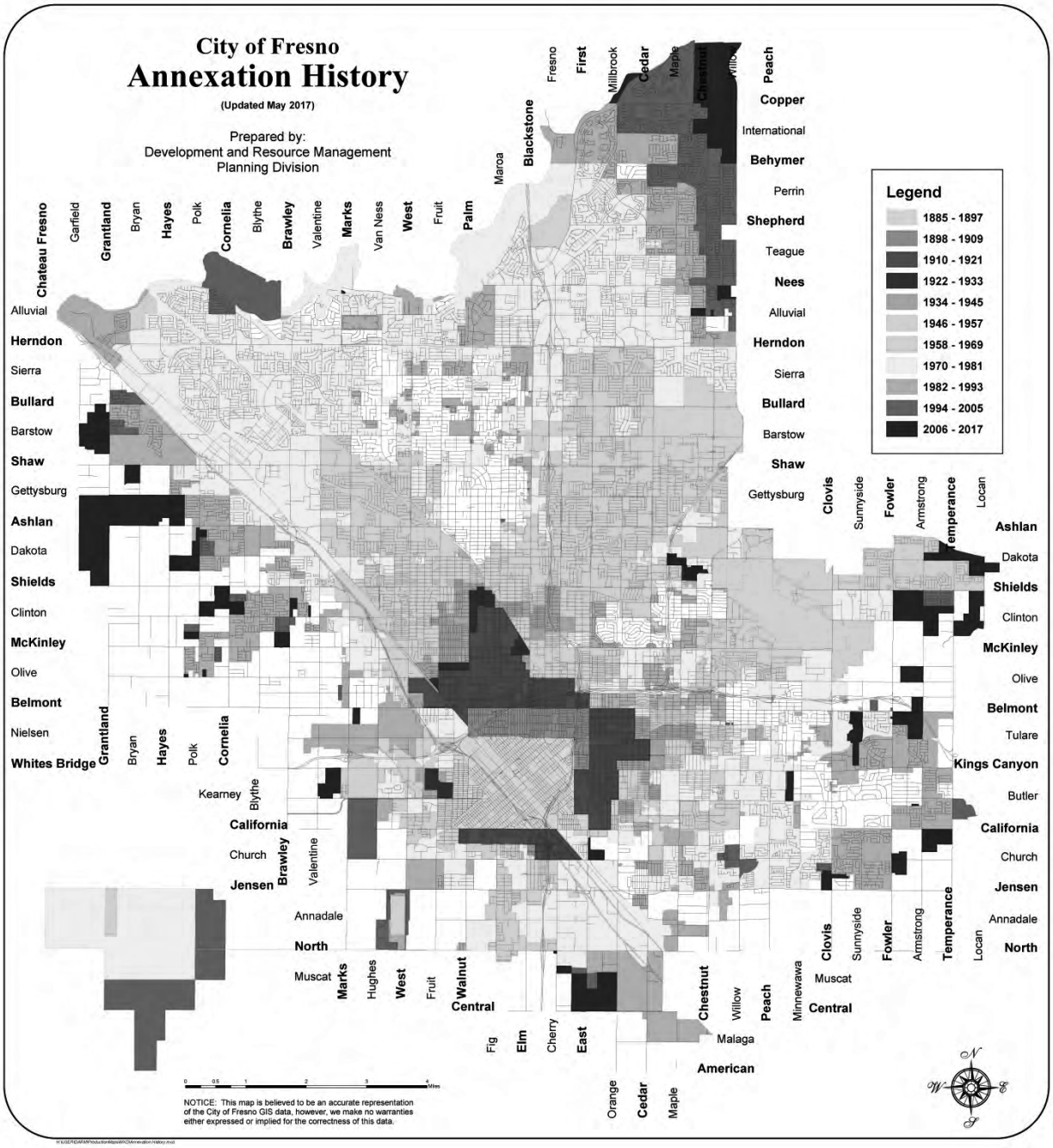
Table E.9 illustrates how the City has grown in terms of population and number of housing units between 2011 and 2017 alone.

Table E.9: City of Fresno's Change in Population and Housing Units, 2011-2017

2011 Population	2017 Population Estimate	Estimated Percent Change 2011-2017	2011 # of Housing Units	2017 Estimated # of Housing Units	Estimated Percent Change 2011-2017
498,664	525,832	+5,49	172,171	178,819	+3.86

Source: California Department of Finance, www.dof.ca.gov/Forecasting

Figure E.3: City of Fresno's Annexation History



Source: City of Fresno Development Department. This map is believed to be an accurate representation of the City of Fresno GIS data, however, we make no warranties either expressed or implied for the correctness of this data.

By December 31, 2035 (the "Horizon" year of the most recent Fresno General Plan), it is estimated that 771,000 people will reside in the Fresno Metropolitan Area (which would include County islands and areas inside the City's Sphere of Influence but not yet annexed). This figure of 771,000 would be 64 percent of the projected 2035 Fresno County population of 1,201,416 (State of California Department of Finance population projections).

As of August of 2017, the City of Fresno comprised 115.3 square miles of annexed (incorporated) land within its 161.8-square mile Sphere of Influence. Development had reached the natural and political northerly boundary of the City, the San Joaquin River, and began expanding to the west and southeast through conversion of rural residential and agricultural land. Within the Sphere of Influence, there continued to be "County islands" and partially urbanized fringe areas. An urban unification annexation program may reduce the numbers and sizes of these enclaves in the coming decade.

The Fresno General Plan made a concerted effort to revitalize the City's downtown by balancing new growth areas to geographically recenter the downtown. With construction of a major sewer trunk along the Grantland Avenue alignment and proposed construction of new wastewater and water treatment plants in the southeastern area, the City's future growth is expected to concentrate primarily to the west and southeast.

The Fresno Metropolitan Flood Control District (FMFCD) has commenced major flood control facility construction on Fancher Creek in the eastern portion of the City's Sphere of Influence. Since the Fresno General Plan was completed in December 2014, the FMFCD will compile technical studies and update its master service plan in conjunction with the City's land use plan for this new growth area.

The Fresno General Plan also directed that new development be more compact and that single-family residential densities be higher than the City's traditional 4± dwelling units/acre pattern for subdivisions. The recently adopted Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan and other plan amendments and projects in process (and proposed in the future) feature smaller lots, multi-story housing, multi-family units, and reduced setbacks.

Unless the cost of manufactured housing units would provide a substantial savings over site-built homes, it is not expected that the proportion of manufactured housing in the City of Fresno will greatly increase. It is possible that there will be some increase as producers of these units create models with appropriate roof pitches and other features to meet the City's design review standards.

More information about the City of Fresno's growth and current housing stock is available in the City of Fresno General Plan 2015-2023 Housing Element commissioned by the City of Fresno Development and Resource Management Department and prepared by MIG, Inc (available at www.fresno.gov/housingelement). More general information on growth and development in Fresno County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Fresno County Vulnerability and Assets at Risk of the main plan.

E.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards, where quantifiable, and/or where (through HMPC member input) it differs from that of the overall County.

Table E.6 above shows Fresno's exposure to hazards in terms of number and value of structures. Fresno County's parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern day building codes. No further information on vulnerable structures is available. Impacts of past events and vulnerability to specific hazards are further discussed below (see Section 4.1 Hazard Identification for more detailed information about these hazards and their impacts on Fresno County).

Agricultural Hazards

Agricultural hazards are ranked with a Low significance in the City of Fresno; lower than for the County overall (ranked High) because very little land in the City is used for agricultural purposes. Agricultural losses due to hazard events have greater economic impact on the small communities and rural areas of the County than on the City of Fresno. However, ornamental and garden plants in the City, and pets and incidental livestock kept within City limits, may become involved in any countywide responses to crop pests or infectious agents, because these urban plants and animals provide reservoirs for the diseases and crop pests that threaten the County's agriculture.

Dam Failure

The National Inventory of Dams lists five dams located in the City of Fresno, including the Redbank Creek Detention basin, Fancher Creek Detention, Friant Millerton Road Embankment A, Redbank, and Friant Dike 3.

Drought

Annual rainfall in the City of Fresno is typically 12-14 inches. This makes the region vulnerable to episodic drought and to chronic drawdown of aquifer levels (the U.S. Environmental Protection Agency has designated the groundwater below Fresno as a sole source aquifer). Water in this aquifer has historically flowed through permeable strata from north and northeast toward the south and west, but the aquifer has been so affected by drawdown that a "cone of depression" has been created, reversing the historic flow directions (the "groundwater gradient") in portions of west and south Fresno.

In the last 10 years the City of Fresno has made strides to reduce dependence on groundwater by setting a course to implement water plans, which include the Urban Water Management Plan, Recycled Water Waster Plan, and the recently adopted Water Capital Program. A surface water treatment plant is currently under construction in Southeast Fresno and should be completed by 2018. When operational, the plant will maximize use of Fresno's surface water allocations during

normal years and allow the City to reduce overuse of groundwater. Recycled water use will also grow in Fresno with the new recycled water mains now being constructed. The City has plans to use 25,000 acre-feet per year of recycled water for irrigating open spaces, parks, street medians and golf courses.

Earthquake

The seismic hazard in the City of Fresno is low relative to California coastal and mountain communities and is lower than in the Sierra and western areas of Fresno County. There are no known earthquake faults underlying Fresno, and the City has never been the epicenter of a known seismic event. However, Fresno is considered to have a moderate risk of earthquake damage due to the presence of major fault systems to the west, south, and east and due to Fresno's large population and number of buildings, critical facilities, and infrastructure and other development that could be vulnerable to more severe ground shaking.

Historically, Fresno has sustained very little damage from major earthquakes occurring on California's major faults: the Owens Valley earthquake of 1872 toppled an unreinforced masonry (brick) church steeple. More recent major earthquakes in the past four decades (with epicenters near Coalinga and the Bay Area) have resulted in perceptible tall building swaying in Fresno, minor injuries (attributable to shelved items falling), and slight damage (e.g., minor cracked plaster, etc.). To date, no soil liquefaction has been observed in Fresno from any seismic event.

The most serious impacts of an earthquake in Fresno would probably arise from damage to large dams in the Sierra Nevada on the upper reaches of the San Joaquin River very close to active Long Valley Caldera-related faults. Should either of the two most easterly (and largest) dams in this area be severely damaged or breached, the resulting sequential dam failures could cause floodwaters to overtop Friant Dam northeast of the City. While the dam failure inundation map for Friant shows that most of the flooded area would be expected in the northwest part of town (where the confining river bluffs are not as high), there are some residences and important infrastructure in the river channel itself that would be inundated and gravely damaged (or destroyed), including highway bridges and the inlet of the Friant-Kern Canal, which supplies Bureau of Reclamation surface water to the Fresno area and to other communities in the southern San Joaquin Valley.

Epidemic/Pandemic

Fresno's population includes many residents who have limited access to health care, with causes related to low household income levels, lack of insurance coverage, a limited number of primary health care facilities and acute care beds, a low ratio of public health and medical professionals to population, and language barriers. Highly communicable diseases tend to affect a large percentage of the City, perhaps due to large household size and the mobility of the population. If a highly communicable disease outbreak occurred that caused serious or life-threatening illness for most infected persons, health care and other public service systems would experience disruption or breakdown and would require outside intervention with resources from other communities, the state, or the federal government.

Extreme Cold/Freeze

Freeze events occur occasionally in Fresno, but impacts are greater to the agriculture industry in the County than to the City. In January 2007, overnight minimum temperatures fell below freezing between January 6 and 10. The event led to a presidential disaster declaration due to the estimated $710 million in agricultural damage in the Central and South Valley. The 2007 event occurred in another eight-year interval after the devastating citrus freezes of 1998 and 1990. The event caused frozen pipes in Fresno but little other property damage. The City also has a plan for freezing temperature events and opens warming centers. These centers are primarily geared toward the homeless population.

Extreme Heat

Fresno uses a local version of the California State Plan for Extreme Heat. This plan was used during the extreme heat event during the summer of 2006 and worked well. The City operates cooling centers, which are primarily geared toward the homeless. Public notification for extreme heat events is conducted through the Public Affairs office in coordination with Fresno County.

Expansive Soils

These types of soils occur in northern Fresno in the far northeastern portions of its Sphere of Influence (in the "Copper River" area). Expansive clay soils can cause cavitation over time and require special construction standards for foundations.

Flood

As noted in the preceding section, there is some flood risk to the City from San Joaquin River major dam failure inundation, but the more common flood risk, repetitively experienced in Fresno, is that of shallow "sheet" flooding from major precipitation events. Except for the San Joaquin River, streams in the Fresno-Clovis Metropolitan Area originate in the Sierra foothills to the east and extend into the valley floor west of State Route 99 by way of dual-use irrigation and storm runoff channels and disperse into numerous smaller irrigation canals. Overflow from these canals and urban stormwater from intense precipitation events is sent back to the San Joaquin River or to farmland southwest of Fresno via spillway channels.

In the City of Fresno, these canals and channels are under control of the Fresno Irrigation District, an independent public agency, but their use during storm events is shared by another independent district, the Fresno Metropolitan Flood Control District (FMFCD). The FMFCD was created to develop flood control facilities to prevent further repetitive losses created by the Fresno Stream Group and to provide an urban drainage network. This District is responsible for administering a Storm Drainage and Flood Control Master Plan. The City's municipal code supports these efforts by including a Drainage Fee Ordinance to ensure that grading and development comply with the FMFCD's Master Plan and standards and provide proportionate shares of storm drain and ponding basin infrastructure.

The City of Fresno's Floodplain Ordinance further coordinates and supports FMFCD efforts. This ordinance and the Fresno General Plan Safety Element policies require conformance to FEMA floodplain management policies and to those of California's Central Valley Flood Prevention Board (which regulates the designated floodway along the San Joaquin River channel). Still, in areas not completely developed to urban standards, areas where the urban drainage network is not yet completed, and in some County "island" areas (land within the City that the County has authority over), stormwater drainage facilities may not prevent localized shallow flooding during intense runoff events.

According to FEMA's 2016 Flood Insurance Study (FIS), the following major canals and ditches run through the City:

- **Central Canal** flows southwest through the southeastern part of the City of Fresno.
- **Dry Creek Canal** begins at the confluence of Mill Ditch and Herndon Canal, just downstream of North Millbrook Avenue, and flows southwest through the southwestern portion of the City.
- **Fancher Creek Canal** flows southwest along the eastern corporate limits of the City of Fresno and joins Central Canal at the southeast corner of the City.
- **Herndon Canal** begins at the confluence of Mill Ditch and Dry Creek Canal. It flows west through the center of the City of Fresno, then flows northwest through the northwestern part of the City.
- **Mill Ditch** flows west along East McKinley Avenue to its confluence with Herndon and Dry Creek Canals.

The FIS details the City of Fresno's flood history as follows:

In February 1884, flood flows from streams of the Fresno-Clovis group inundated the business section of the City of Fresno. Frequent flooding was a problem in the City throughout the 1880. Suburban areas of the City were flooded in spring 1920; the downtown area was inundated in 1923; flooding occurred in the Fig Garden area in 1936; and parts of the City, especially in the northeast section, were flooded in March 1938. Since the 1938 flood, which had an estimated discharge of 2,700 cubic feet per second (cfs) on Dry Creek at the Big Dry Creek Dam site, high flows occurred on that stream in December 1955 (3,800 cfs), January 1969 (5,700 cfs), and February 1969 (4,500 cfs). During December 1955, approximately 500 acres of agricultural and suburban land were flooded by overflow from irrigation canals, and damage, mostly to public facilities, totaled approximately $50,000. The largest and most damaging flood period was January and February 1969, when the combined discharges of Dry, Dog, Redbank, Fancher, and Mud Creeks flooded an estimated 14,500 acres and caused almost $4.7 million in damage. Most of the flooding was in the eastern and northeastern parts of the City. It occurred because many of the streams in the Fresno-Clovis group discharged floodwater into various irrigation canals, causing them to overflow.

Values at Risk

Following the methodology described in Section 4.3.2 Vulnerability of Fresno County to Specific Hazards, a flood map for the City of Fresno was created (see Figure E.4). Tables E.10 and E.11 summarize the values at risk in the City's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood.

Figure E.4: City of Fresno's 100- and 500-Year Floodplains

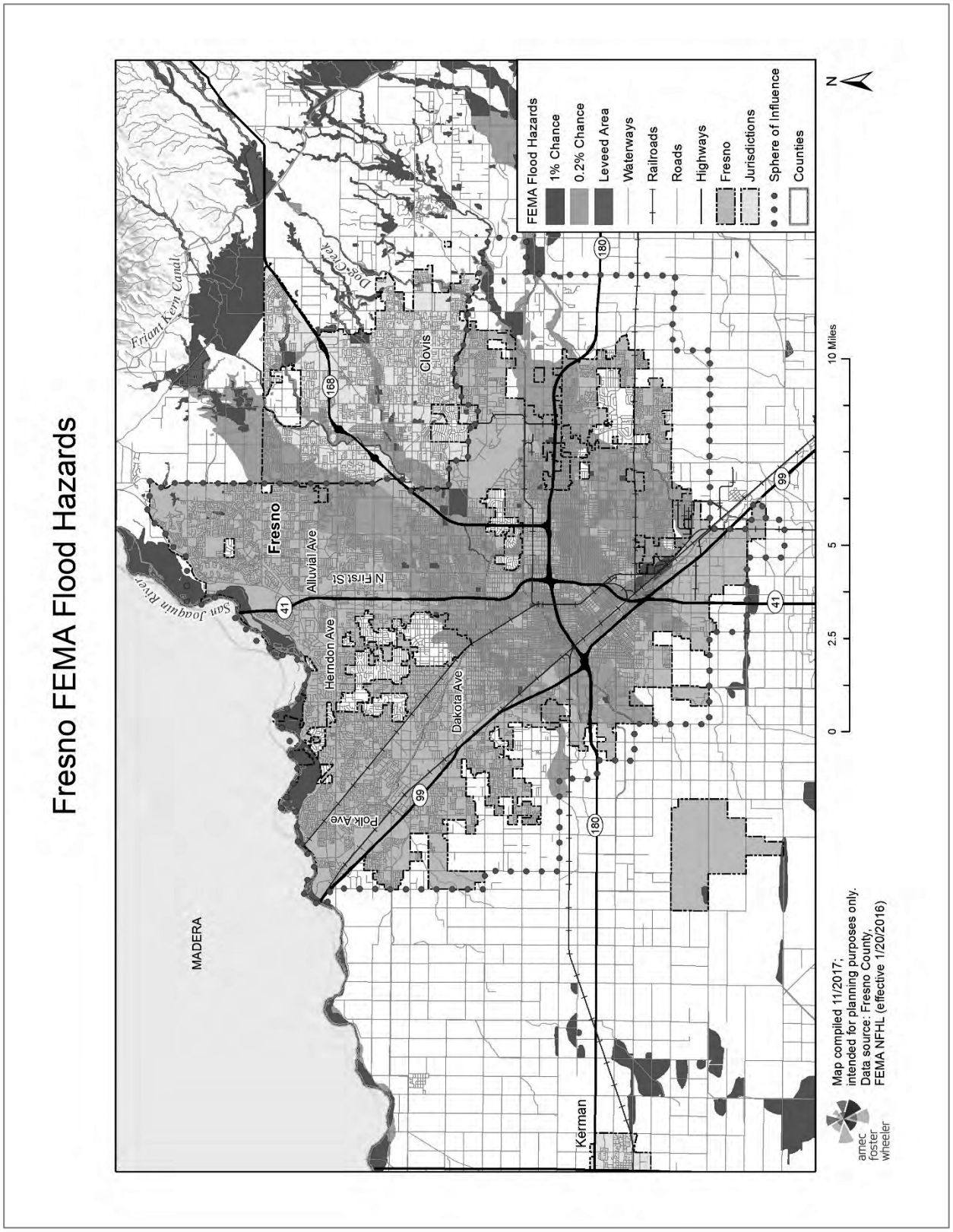


Table E.10: City of Fresno's FEMA 1% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	1	0	$60,933	$60,933	$121,866	$30,467
Commercial	23	210	$6,222,246	$6,222,246	$12,444,492	$3,111,123
Exempt	29	35	$0	$0	$0	$0
Industrial	70	107	$30,681,072	$46,021,608	$76,702,680	$19,175,670
Multi-Residential	11	84	$2,529,983	$1,264,992	$3,794,975	$948,744
Residential	97	120	$23,269,875	$11,634,938	$34,904,813	$8,726,203
Total	**231**	**556**	**$62,764,109**	**$65,204,716**	**$127,968,825**	**$31,992,206**

Sources: Fresno County 2017 Parcel and Assessor data; FEMA 2009 FIRM

Table E.11: City of Fresno's FEMA 0.2% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	29	29	$746,974	$746,974	$1,493,948	$373,487
Commercial	2,814	9,030	$1,574,492,657	$1,574,492,657	$3,148,985,314	$787,246,329
Exempt	381	1,404	$0	$0	$0	$0
Industrial	745	1,435	$309,126,790	$463,690,185	$772,816,975	$193,204,244
Multi-Residential	2,299	20,013	$797,001,401	$398,500,701	$1,195,502,102	$298,875,525
Residential	31,581	32,817	$2,677,387,750	$2,677,387,750	$5,354,775,500	$1,338,693,875
Total	**37,849**	**64,728**	**$5,358,755,572**	**$5,114,818,267**	**$10,473,573,839**	**$2,618,393,460**

Sources: Fresno County 2017 Parcel and Assessor data; FEMA 2009 FIRM

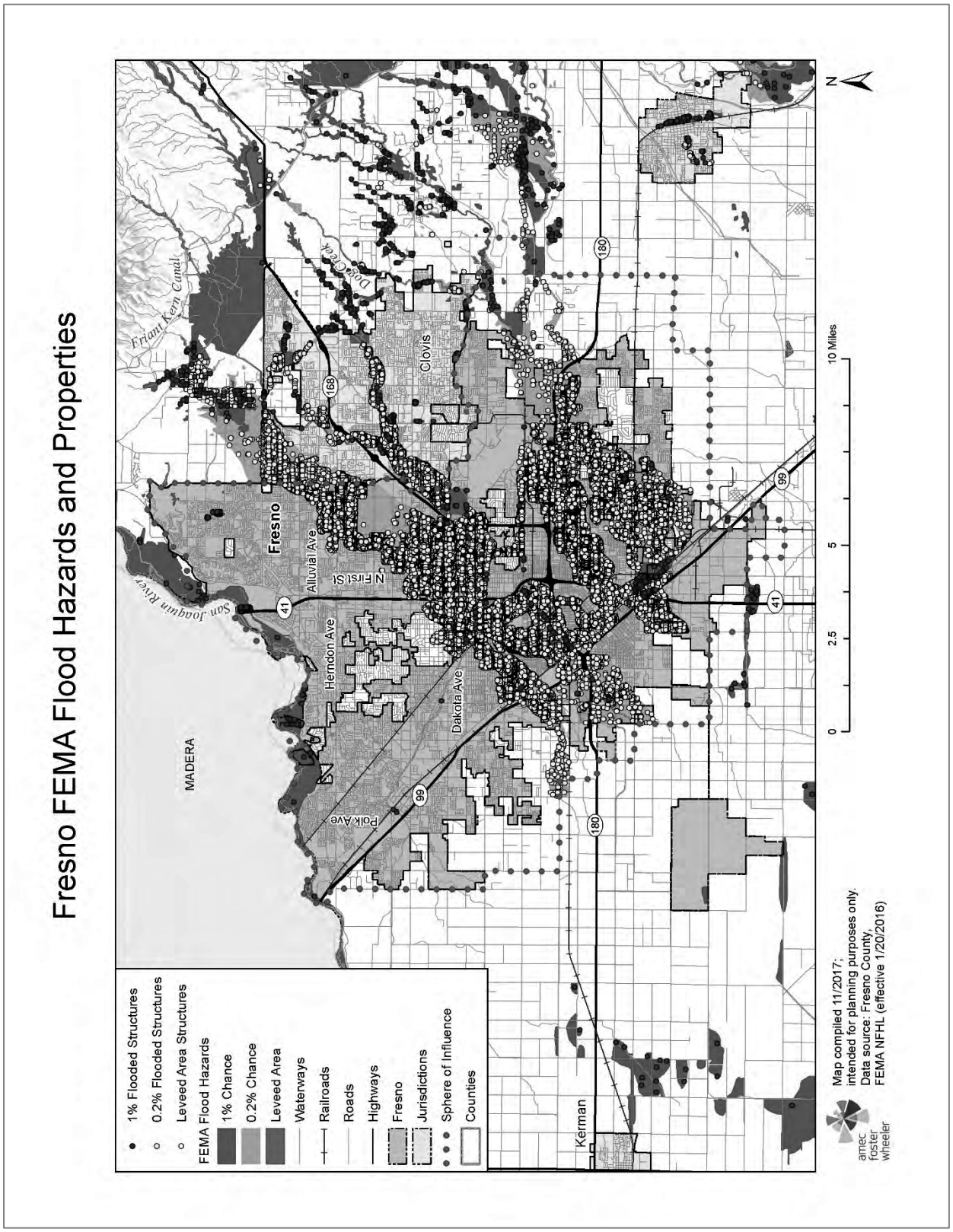
Based on this analysis, the City of Fresno has significant assets at risk to the 100-year and greater floods. There are 231 improved parcels within the 100-year floodplain for a total value of roughly $128 million, including building and content value. An additional 37,849 improved parcels valued at roughly $10.5 billion fall within the 500-year floodplain.

Applying the 25 percent damage factor as described in Section 4.3.2, there is a 1 percent chance in any given year of a 100-year flood causing roughly $32.0 million in damage in the City of Fresno and a 0.2 percent chance in any given year of a 500-year flood causing roughly $2.65 billion in damage (combined damage from both floods).

Properties at risk to flooding are shown in relation to the mapped floodplains in Figure E.5.

Limitations: This model may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage. Also, the assessed values are well below the actual market values. Thus, the actual value of assets at risk may be significantly higher than those included herein.

Figure E.5: City of Fresno's Properties at Risk in the 100- and 500-Year Floodplains



In addition to the 100-year and 500-year floodplains mapped by FEMA, the California Department of Water Resources maintains Best Available Maps (BAM) which include the floodplains in the Sacramento and San Joaquin River Basins, based on a study performed in 2002 by the U.S. Army Corps of Engineers (USACE). Though limited to the San Joaquin River as a flood source and thus not as comprehensive as the FEMA FIRM, the USACE study shows additional differentiation in flood risk by modeling the 200-year floodplain (the flood with a 0.5 percent annual chance of occurring). Table E.12 summarizes the values at risk by property type within the 200-year floodplain and loss estimates to the 200-year storm using the same methodology described above.

Table E.12: City of Fresno's FEMA 0.5% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	1	0	$60,933	$60,933	$121,866	$30,467
Commercial	3	139	$4,322,495	$4,322,495	$8,644,990	$2,161,248
Exempt	5	5	$0	$0	$0	$0
Residential	18	19	$12,103,507	$6,051,754	$18,155,261	$4,538,815
Total	**27**	**163**	**$16,486,935**	**$10,435,182**	**$26,922,117**	**$6,730,529**

Sources: Fresno County 2017 Parcel and Assessor data; CA DWR BAM; USACE

Based on this analysis, there are 27 parcels within the 200-year floodplain valued at nearly $10.5 million. Applying the 25 percent damage factor, there is a 0.5 percent annual chance of a 200-year flood causing $6.73 million in damage in the City of Fresno.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Fresno joined the National Flood Insurance Program (NFIP) on December 1, 1982. In addition to providing insurance for properties at risk of flooding, the program collects and publishes statistics on flood-related losses in participating jurisdictions.

NFIP insurance data for the City of Fresno indicates that as of March 30, 2017, there were 323 flood insurance policies in force in the City with $99,316,700 in coverage. This coverage represents a decline of nearly 200 policies over the last decade. Of the 323 policies, 277 were residential (267 for single-family homes) and 46 were nonresidential. 56 of the policies were in A zones (including A01-30, AE, AO, and AH), and the remaining 267 policies were in B, C, and X zones. Policies in B, C, and X zones have increased slightly over the past decade, while policies in the 100-year floodplain have dramatically declined.

There have been 81 historical claims for flood losses totaling $765,183; 73 were for residential properties; 37 were in A zones and 36 were in B, C, or X zones; and 54 were pre-FIRM structures (17 of the 19 post-FIRM structures with reported losses were in a B, C, or X zone). According to the FEMA Community Information System accessed 9/17/2018 there was one Repetitive Loss and no Severe Repetitive Loss properties located in the jurisdiction.

Population at Risk

Using parcel data from the County, the digital flood insurance rate map, population at risk was calculated for the 100-year and 500-year floods based on the number of residential properties at risk and the U.S. Census Bureau 2016 estimate for the average number of persons per household (3.17). The following are at risk to flooding in the City of Fresno:

- 100-year flood—342 people
- 500-year flood—107,400 people
- **Total flood**—107,742 people

Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. Table E.13 lists the critical facilities in the City's 100- and 500-year floodplains.

Table E.13: Critical Facilities in the 100- and 500-Year Floodplains: City of Fresno

Critical Facility Type	100-Year Floodplain	500-Year Floodplain
Airport	-	1
Behavioral Health	-	1
CalARP	1	12
Colleges & Universities	-	5
Communications	-	1
County Government	-	2
Daycare	-	52
Department of Agriculture	-	2
Department of Public Health	-	2
Department of Social Services	-	6
District Attorney	-	1
Fire Station	-	7
General Services	-	3
Health Care	-	1
Nursing Home	-	12
Police	-	5
School	-	68
Urgent Care	-	2
Total	**1**	**183**

Source: Fresno County, HIFLD 2017

Hazardous Materials Incident

The following are the primary concerns for the City of Fresno related to hazardous materials release:

- Train derailments

- Kinder-Morgan pipeline
- Chevron petroleum pipelines
- Storage facilities

There are 28 CalARP hazardous materials facilities located in the City of Fresno. As detailed in Table E.14, there are 62 critical facilities located within a half mile of a CalARP facility.

Table E.14: Critical Facilities within ½ mile of CalARP Facility: City of Fresno

Critical Facility Type	Count
Colleges & Universities	1
Communications	1
County Government	4
Courthouse	1
Daycare	11
Department of Public Health	2
Department of Social Services	4
Detention Center	4
District Attorney	2
Fire Station	4
Health Care	3
Nursing Home	4
Police	1
School	17
Sheriff	1
Supplemental College	1
Urgent Care	1
Total	**62**

Source: Fresno County, HIFLD 2017

For more information on this hazard please refer to the main plan, Section 4.

Severe Weather: Fog

The risk and vulnerability factors for fog in the City is not unique from the County at large. Please refer to the main plan's discussion of the fog hazard in section 4.

Severe Weather: Windstorm

Fresno's prevailing winds are typically light and from the northwest. High wind conditions are occasionally created by strong weather fronts. Occasionally, there are funnel clouds of low intensity. Past structural damage has been light, infrequent, and very limited in geographic extent. Injuries have been extremely rare. Most of this damage has occurred secondary to large trees being blown over. The City's design wind load, the level of wind force that new structures are required to be engineered to withstand, is 70 mph.

Soil Hazards: Land Subsidence

Despite long-term over-drafting of groundwater that has lowered the static water table under Fresno by as much as 100 feet over the past century, ground level subsidence has not been noted in the vicinity of the City (this is probably due to the geologic strata underlying the City, which features layers of clay and hardpan interleaved with sand and gravel layers).

Wildfire

Similar to many areas of the County, Fresno has high temperatures in the summer with low rainfall creating fire hazard conditions. There is some wildfire risk in the San Joaquin River Bluff area in northern Fresno due to vegetation and steep slopes.

Following the methodology described in Section 4.3.2 Vulnerability of Fresno County to Specific Hazards, a wildfire map for the City of Fresno was created (see Figure E.6). An analysis was performed using GIS software to determine where populations, values at risk, and critical facilities are located within wildfire threat zones. Table E.15 shows the values at risk in the moderate wildfire threat zone (there are no values at risk in the high or very high threat zones). There are not any critical facilities in wildfire threat zones in the City of Fresno.

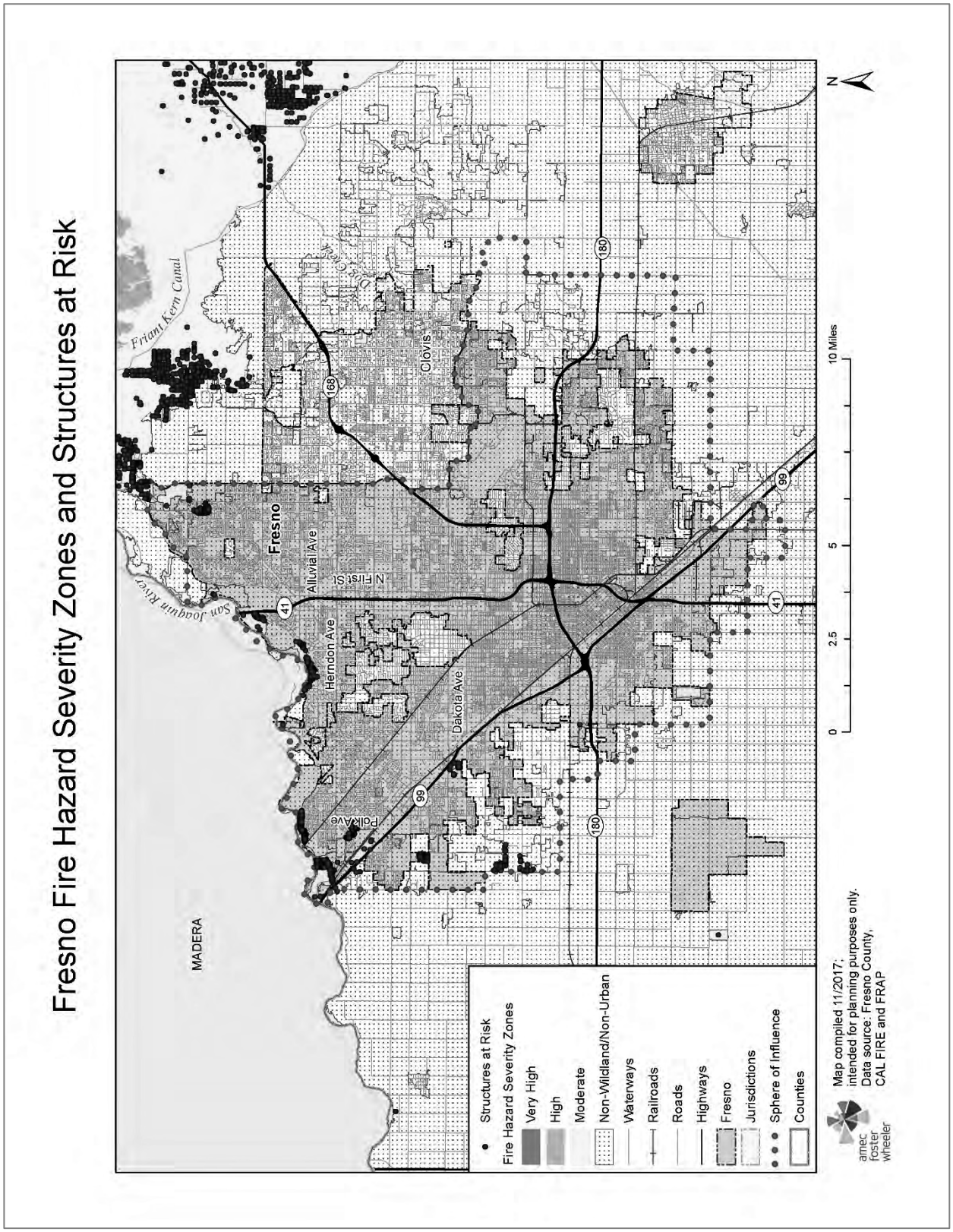
Table E.15: Values at Risk to Wildfire (Moderate Threat) in the City of Fresno

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value
Agricultural	1	0	$60,933	$60,933	$121,866
Commercial	13	36	$24,379,836	$24,379,836	$48,759,672
Exempt	12	13	$0	$0	$0
Industrial	4	4	$2,105,480	$3,158,220	$5,263,700
Multi-Residential	1	16	$255,200	$127,600	$382,800
Residential	772	779	$180,172,709	$90,086,355	$270,259,064
Total	**803**	**848**	**$206,974,158**	**$117,812,944**	**$324,787,102**

Sources: Fresno County 2017 Parcel and Assessor data

Based on this analysis, the City of Fresno's moderate wildfire threat affects 2,450 people and 803 improved parcels valued at roughly $324,787,102. Almost all of the parcels at risk are in the San Joaquin River corridor, where development is very restricted due to flood risk and bluff instability. Other parcels are in industrial areas along the western edge of the City, where the City's weed abatement ordinances (requiring vegetation control by April) would reduce the wildfire risk.

Figure E.6: City of Fresno's Wildfire Threat



E.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Amec Foster Wheeler consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The City of Fresno's updated capabilities are summarized below.

E.4.1 Regulatory Mitigation Capabilities

Table E.16 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Fresno.

Table E.16: City of Fresno's Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General Plan	Yes	The Fresno General Plan has a Noise and Safety Element with policies for wildland fire hazards, seismic/geologic hazards, storm drainage and flood control, hazardous materials, airport safety, and emergency response
Zoning Ordinance	Yes	Fresno Municipal Code Chapter 15; Zoning Ordinance has requirements related to health and safety (e.g., dwelling unit density controls, building setbacks for fire protection, masonry walls along major streets)
Subdivision Ordinance	Yes	Fresno Municipal Code Chapter 15 requires multiple points of access for ingress/egress, fire protection provisions, etc.
Development Permit (formerly Site Plan Review) requirements	Yes	Required for all nonresidential development projects and multi-family projects over two units; required for duplexes in some zone districts; plot plan review required for even single-family residential construction
Growth Management Ordinance	Yes	Fresno Municipal Code Chapter 12 provides for extension of urban infrastructure and services including sewer treatment, water supply, and fire protection
Floodplain Ordinance	Yes	Fresno Municipal Code Chapter 13 (local building codes) includes the Flood Damage Prevention Ordinance
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	- Within the Zoning Ordinance, there is a Bluff Preservation Overlay district with requirements for soil stability analysis and setbacks from the San Joaquin bluff edge

Regulatory Tool	Yes/No	Comments
		- Pretreatment Ordinance and environmental control program for wastewater system to prevent and abate any hazardous material releases
Building Code	Yes	Version: 2016 California Building Code with a few City modifications: fire sprinkler ordinance, swimming pool ordinance, and security ordinance
Fire Department ISO Rating	Yes	Rating: 3
Erosion or Sediment Control Program	Yes	The Bluff Preservation Ordinance, as well as grading plan review and stormwater pollution prevention plans, which are required for all development projects through project conditions and CEQA review
Stormwater Management Program	Yes	In conjunction with Cal-EPA, Regional Water Quality Control Board, and Fresno Metropolitan Flood Control District
Capital Improvements Plan	Yes	Public Works Department and Department of Public Utilities formulate and administer these plans
Economic Development Plan	Yes	Fresno Redevelopment Agency and Economic Development Division of the Planning and Development Department
Local Emergency Operations Plan	Yes	Ratified by City Council in 2005 and last updated in 2015
Flood Insurance Study or other engineering study for streams	Yes	FEMA Flood Insurance Study, 2005

Fresno General Plan (Adopted December 18, 2014)

The Fresno General Plan is a blueprint of how the City anticipates directing and managing growth while minimizing potential impacts for existing and future generations. It provides long-range planning strategies for the continued development, enhancement, and revitalization of the Fresno Metropolitan Area. The plan goals are the guiding principles and provide the framework for the objectives and policies that can be found in the plan elements. The following general plan goals directly or indirectly mitigate hazards identified in this plan:

- **Goal 9**—Promote a city of healthy communities and improve quality of life in established neighborhoods.
  - *Emphasize supporting established neighborhoods in Fresno with safe, well maintained, and accessible streets, public utilities, education and job training, proximity to jobs, retail services, health care, affordable housing, youth development opportunities, open space and parks, transportation options, and opportunities for home grown businesses.*
- **Goal 12**— Resolve existing public infrastructure and service deficiencies, make full use of existing infrastructure, and invest in improvements to increase competitiveness and promote economic growth.
  - *Emphasize the fair and necessary costs of maintaining sustainable water, sewer, streets, and other public infrastructure and service systems in rates, fees, financing and public investments to implement the General Plan. Adequately address accumulated deferred maintenance, aging infrastructure, risks to service continuity, desired standards of service to meet quality-of-life goals, and required infrastructure to support growth, economic competitiveness and business development.*
- **Goal 16**— Protect and improve public health and safety.

Some of the elements of the General Plan also contain objectives and policies relevant to protecting human health and safety (e.g., supporting objectives and policies in the Public Utilities and Services Element direct that amendments to construction and fire codes to reduce the level of risk to life and property from fire commensurate with the City's fire suppression capabilities and that fire and police services be provided). Because the Noise and Safety Element is the portion of the General Plan most relevant to hazard mitigation, select objectives and policies are extracted and included below.

The Noise and Safety Element

The Noise and Safety Element seeks to reduce deaths, injuries, illnesses, damage to property, and economic and social dislocation that could result from hazards. Of specific relevance to this plan, it addresses seismic and geologic conditions, flooding, hazardous materials, and emergency response.

Seismic and Geologic Hazards

NS-2. Objective: Minimize risks of property damage and personal injury posed by geologic and seismic risks.
NS-2-a. Policy: Seismic Protection. Ensure seismic protection is incorporated into new and existing construction, consistent with the Fresno Municipal Code.
NS-2-b. Policy: Soil Analysis Requirement. Identify areas with potential geologic and/or soils hazards, and require development in these areas to conduct a soil analysis and mitigation plan by a registered civil engineer (or engineering geologist specializing in soil geology) prior to allowing on-site drainage or disposal for wastewater, stormwater runoff, or swimming pool/spa water.
NS-2-c. Policy: Landfill Areas. Require proposed land uses on or near landfill areas to be designed and maintained to comply with California Code of Regulations, Title 27, Section 21190, Post Closure Land Use.
NS-2-d. Policy: Bluff Preservation Overlay Zone. Per the requirements of the Bluff Preservation Overlay Zone District and Policy POSS-7-f (Chapter 5, Parks and Open Space), the following standards shall be applicable for property located within the Bluff Preservation zone: • Require proposed development within 300 feet of the toe of the San Joaquin River bluffs to undertake an engineering soils investigation and evaluation report that demonstrates that the site is sufficiently stable to support the proposed development, or provide mitigations to provide sufficient stability; and • Establish a minimum setback of 30 feet from the San Joaquin River bluff edge for all buildings, structures, decks, pools and spas (which may be above or below grade), fencing, lighting, steps, etc. o An applicant may request to reduce the minimum setback to 20 feet from the bluff edge if it can be demonstrated, to the satisfaction of the City's Building Official and the Planning Director, that the proposed building, structure, deck, pool and/or spas (which may be above or below grade), fencing, steps, etc., will meet the objectives of the Bluff Preservation Overlay Ordinance. In no case shall the setback be reduced to less than 20 feet.

Flooding Hazards

NS-3. Objective: Minimize the risks to property, life, and the environment due to flooding and stormwater runoff hazards.
NS-3-a. Policy: Stormwater Drainage and Flood Control Master Plan. Support the full implementation of the FMFCD Storm Drainage and Flood Control Master Plan, the completion of planned flood control and drainage system facilities, and the continued maintenance of stormwater and flood water retention and conveyance facilities and capacities. Work with the FMFCD to make sure that its Storm Drainage and Flood Control Master Plan is consistent with the General Plan.

NS-3-b. Policy: Curb and Gutter Installation. Coordinate with Fresno Metropolitan Flood Control District (FMFCD) to install curbing, gutters, and other drainage facilities with priority to existing neighborhoods with the greatest deficiencies and consistent with the Storm Drainage and Flood Control Master Plan.
NS-3-c. Policy: Dual Use Facilities. Support multiple uses of flood control and drainage facilities as follows: • Use, wherever practical, FMFCD facilities for groundwater management and recharge; and • Promote recreational development of ponding basin facilities located within or near residential areas, compatible with the stormwater and groundwater recharge functions.
NS-3-d. Policy: Landscaped Buffer. City will support the development of FMFCD ponding basins including the landscaping and irrigation for the top one third of the side sloped areas consistent with the FMFCD Basin Design Criteria.
NS-3-e. Policy: Pollutants. Work with FMFCD to prevent and reduce the existence of urban stormwater pollutants pursuant to the requirements of the National Pollution Discharge Elimination Systems Act.
NS-3-f. Policy: Flooding Emergency Response Plans. Work with responsible agencies to update emergency dam failure inundation plans, evacuation plans and other emergency response plans for designated flood-prone areas, including the San Joaquin river bottom.
NS-3-g. Policy: Essential Facilities Siting Outside of Floodplains. Avoid siting emergency response and essential public facilities, such as fire and police stations, within a 100-year floodplain, unless it can be demonstrated that the facility can be safely operated and accessed during flood events.
NS-3-h. Policy: Runoff Controls. Implement grading regulations and related development policies that protect area residents from flooding caused by urban runoff produced from events that exceed the capacity of the Storm Drainage and Flood Control Master Plan system of facilities. Place all structures and/or flood-proofing in a manner that does not cause floodwaters to be diverted onto adjacent property, increase flood hazards to other property, or otherwise adversely affect other property.
NS-3-i. Policy: New Development Must Mitigate Impact. Require new development to not significantly impact the existing storm drainage and flood control system by imposing conditions of approval as project mitigation, as authorized by law. As part of this process, closely coordinate and consult with the FMFCD to identify appropriate conditions that will result in mitigation acceptable and preferred by FMFCD for each project. *Commentary: The City recognizes the expertise and significant role of the FMFCD, and will give the highest deference to its recommendations for mitigation measures, consistent with applicable law.*
NS-3-j. Policy: National Flood Insurance Program. Continue to participate in the National Flood Insurance Program (NFIP) by ensuring compliance with applicable requirements. Review NFIP maps periodically to determine if areas subject to flooding have been added or removed and make adjustments to the Land Use Diagram Figure LU-1.
NS-3-k. Policy: 100-Year Floodplain Policy. Require developers of residential subdivisions to preserve those portions of development sites as open space that may be subject to 100-year flood events, unless the flood hazard can be substantially mitigated by development project design.
NS-3-l. Policy: 200-Year Floodplain Protection. Promote flood control measures that maintain natural conditions within the 200-year floodplain of rivers and streams and, to the extent possible, combine flood control, recreation, water quality, and open space functions. Discourage construction of permanent improvements that would be adversely affected by periodic floods within the 200-year floodplain, particularly in the San Joaquin river bottom.
NS-3-m. Policy: Flood Risk Public Awareness. Continue public awareness programs to inform the general public and potentially affected property owners of flood hazards and potential dam failure inundation. Remind households and businesses located in flood-prone areas of opportunities to purchase flood insurance.
NS-3-n. Policy: Precipitation Changes. Work with FMFCD to evaluate the planned and existing stormwater conveyance system in light of possible changes to precipitation patterns in the future.

Hazardous Materials

NS-4. Objective: Minimize the risk of loss of life, injury, serious illness, and damage to property resulting from the use, transport, treatment, and disposal of hazardous materials and hazardous wastes.
NS-4-a. Policy: Processing and Storage. Require safe processing and storage of hazardous materials, consistent with the California Building Code and the Uniform Fire Code, as adopted by the City.
NS-4-b. Policy: Coordination. Maintain a close liaison with the Fresno County Environmental Health Department, Cal-EPA Division of Toxics, and the State Office of Emergency Services to assist in developing and maintaining

hazardous material business plans, inventory statements, risk management prevention plans, and contingency/emergency response action plans.
NS-4-c. Policy: Soil and Groundwater Contamination Reports. Require an investigation of potential soil or groundwater contamination whenever justified by past site uses. Require appropriate mitigation as a condition of project approval in the event soil or groundwater contamination is identified or could be encountered during site development.
NS-4-d. Policy: Site Identification. Continue to aid federal, State, and County agencies in the identification and mapping of waste disposal sites (including abandoned waste sites), and to assist in the survey of the kinds, amounts, and locations of hazardous wastes.
NS-4-e. Policy: Compliance with County Program. Require that the production, use, storage, disposal, and transport of hazardous materials conform to the standards and procedures established by the County Division of Environmental Health. Require compliance with the County's Hazardous Waste Generator Program, including the submittal and implementation of a Hazardous Materials Business Plan, when applicable.
NS-4-f. Policy: Hazardous Materials Facilities. Require facilities that handle hazardous materials or hazardous wastes to be designed, constructed, and operated in accordance with applicable hazardous materials and waste management laws and regulations.
NS-4-g. Policy: Hazmat Response. Include policies and procedures appropriate to hazardous materials in the City's disaster and emergency response preparedness and planning, coordinating with implementation of Fresno County's Hazardous Materials Incident Response Plan.
NS-4-h. Policy: Household Collection. Continue to support and assist with Fresno County's special household hazardous waste collection activities, to reduce the amount of this material being improperly discarded.
NS-4-i. Policy: Public Information. Continue to assist in providing information to the public on hazardous materials.

Emergency Response

NS-6. Objective: Foster an efficient and coordinated response to emergencies and natural disasters.
NS-6-a. Policy: County Multi-Jurisdiction Hazard Mitigation Plan. Adopt and implement the Fresno County Multi-Jurisdiction Hazard Mitigation Plan and City of Fresno Local Hazard Mitigation Plan Annex. *Commentary: The federal Disaster Mitigation Act of 2000 requires that cities, counties, and special districts have a Local Hazard Mitigation Plan to be eligible to receive FEMA hazard mitigation funds. Cities and counties can adopt and use all or part of a regional multi-jurisdictional plan, such as the one prepared by Fresno County, in lieu of preparing all or part of a Local Hazard Mitigation Plan.*
NS-6-b. Policy: Disaster Response Coordination. Maintain coordination with other local, State, and Federal agencies to provide coordinated disaster response.
NS-6-c. Policy: Emergency Operations Plan. Update the City's Emergency Operations Plan periodically, using a whole community approach which integrates considerations for People with access and functional needs in all aspects of planning.
NS-6-d. Policy: Evacuation Planning. Maintain an emergency evacuation plan in consultation with the Police and Fire Departments and other emergency service providers, which shows potential evacuation routes and a list of emergency shelters to be used in case of catastrophic emergencies. Commentary: The evacuation plan will be flexible in order to consider many scenarios and multiple modes of transportation beyond private automobiles. It will provide special provisions for disadvantaged populations, such as those with physical disabilities or those with low or very low incomes, and for areas with fewer resources through neighborhood emergency preparedness programs.
NS-6-e. Policy: Critical Use Facilities. Ensure critical use facilities (e.g. City Hall, police and fire stations, schools, hospitals, public assembly facilities, transportation services) and other structures that are important to protecting health and safety in the community remain operational during an emergency. • Site and design these facilities to minimize their exposure and susceptibility to flooding, seismic and geological effects, fire, and explosions. • Work with the owners and operators of critical use facilities to ensure they can provide alternate sources of electricity, water, and sewerage in the event that regular utilities are interrupted in a disaster.
NS-6-f. Policy: Emergency Vehicle Access. Require adequate access for emergency vehicles in all new development, including adequate widths, turning radii, hard standing areas, and vertical clearance.

NS-6-g. Policy: Emergency Preparedness Public Awareness Programs. Continue to conduct programs to inform the general public, including people with access and functional needs, of the City's emergency preparedness and disaster response procedures.

Fresno Flood Plain Ordinance

The City of Fresno's Flood Plain Ordinance was revised in the late 1990s and formally adopted by the Fresno City Council on September 20, 2005. (In late 2007, the Fresno Municipal Code was republished with its chapters somewhat reorganized. There was no change in the text of the Flood Plain Ordinance at that time, but due to the reorganization of its content, its most recent adoption effective date is January 17, 2008.) The Fresno Flood Plain Ordinance is Article 6 of Chapter 11 of the Fresno Municipal Code.

The purpose of this ordinance is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, and sewer lines; and streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- Ensure that potential buyers are notified that property is in an area of flood hazard; and
- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

In order to accomplish its purposes, the ordinance includes the following methods and provisions:

- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction
- Control filling, grading, dredging, and other development which may increase flood damage
- Prevent or regulate the construction of flood barriers which will unnaturally divert flood water or which may increase flood hazards in other areas
- Control the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters

This ordinance applies to all areas of special flood hazards within the jurisdiction of the City as identified by FEMA's Flood Insurance Study for Fresno County, California and incorporated areas dated September 30, 2005, with accompanying Flood Insurance Rate Maps, and all subsequent amendments and/or revisions. It appoints the building official to administer, implement, and enforce the ordinance by granting or denying development permits in accord with its provisions.

This ordinance includes the following standards of construction related to special flood hazard areas:

- Anchoring
- Construction materials and methods
- Elevation and floodproofing
- Residential construction
- Nonresidential construction
- Flood venting
- Standards for utilities
- Standards for subdivisions
- Standards for manufactured homes
- Standards for recreational vehicles
- Floodways
- Standards for storage of materials and equipment

In conjunction with Fresno's Drainage Fee Ordinance (Fresno Municipal Code Chapter 12, Article 19), which requires local grading and development to conform to the Fresno Metropolitan Flood Control District Master Drainage Plan and to provide proportionate shares of drainage infrastructure, the Fresno Flood Plain Ordinance and its preceding Flood Damage Prevention Ordinance have reduced flood damage losses in the City.

National Flood Insurance Program/Community Rating System

The City of Fresno joined the National Flood Insurance Program (NFIP) on December 1, 1982. It has been a member of the Community Rating System (CRS) since October 1, 1992. The City's Floodplain Administrator duties are assigned to the building official. The Building and Safety Division of the Planning and Development Department works to improve the City's CRS rating, which determines the price paid for flood insurance policies issued in the jurisdiction. The rating is based on detailed biannual audits conducted by FEMA and/or a designee agency (currently, the California Department of Water Resources). The primary means of improving and maintaining a good CRS rating is through administration of the Fresno Flood Plain Ordinance. As part of its efforts to improve its community rating, the City of Fresno has hosted periodic FEMA Region IX NFIP/CRS training.

The City's current CRS rating from October 2016 is Class 8, which reflects the loss of two class levels in the most recent audit.

San Joaquin River Bluff Preservation Ordinance, 1980

After an interagency San Joaquin River Reconnaissance Plan was completed in the late 1970s, the City of Fresno adopted the San Joaquin River Bluff Specific Plan to preserve this important open space and habitat feature and to safeguard the bluff face, which is the most unstable geologic feature in the City. The San Joaquin River Bluff Specific Plan was later subsumed by the 1988 Bullard Community Plan, which carried forward protective policies for this area of Fresno.

The regulation of land use, development, and grading in this portion of Fresno is ongoing pursuant to the Bluff Preservation Ordinance. This ordinance, part of the City's zoning regulations, delineates an overlay zone district along the river bluff (the Bluff Preservation Overlay District), established allowable and prohibited land uses, and set forth conditions and requirements for using or modifying property in the district. The regulations of the district are deemed to be necessary for the preservation of the special qualities of the bluffs and for the protection of the health, safety, and general welfare of owners and users of property in the area.

The Bluff Preservation Ordinance is administered by the Fresno Development and Resource Management Department through its special permit process and grading plan checks. Anyone applying for a building permit is required to submit a site plan review with accompanying soil investigation and evaluation report (prepared by an appropriately licensed professional engineer or registered geologist). The Department's Code Enforcement Division also conducts periodic surveillance of bluff properties for grading and construction done without permits and institutes abatement actions when these conditions are discovered.

Hazardous Material Incident Safeguards

The Fresno Fire Department works with Fresno County Environmental Health to review hazardous material business plans that detail flammable, explosive, toxic, and otherwise hazardous materials used by businesses in the City. The Fire Department has its own permitting requirement for liquid and gaseous fuel tanks to ensure that they are installed and maintained safely. The City's Hazardous Materials Response Unit (housed in a City fire station) maintains the capability to quickly characterize material releases and spills, to evaluate risks to life and property, and to implement appropriate controls and evacuation measures.

Fire Prevention Policy

The City of Fresno has some of the most progressive and effective fire prevention policies and regulations in the nation relating to water supply (fire flow) required for development, ingress and egress from developed buildings and subdivisions, on-site automatic fire suppression systems (sprinkler and on-site private hydrants), building addressing to facilitate rapid emergency response, marking of unsafe buildings (those older structures with hazardous conditions or a lack of water supply), and instant aid/mutual aid with adjacent fire departments belonging to Fresno County special districts and the City of Clovis.

In addition to its extensive network of well-trained and well-equipped firefighting stations, the Fresno Fire Department has a Fire Prevention Bureau, under supervision of the City's fire marshal, to administer regulations adopted and referenced by the Fresno Municipal Code Chapter 6, Article 5 relating to fire prevention. The Fire Prevention Bureau carries out these responsibilities by conducting routine inspections of all public and commercial buildings, performing detailed development permit and construction plan checks, and investigating arson.

Another component of the City's overall fire protection program is the administration of its public nuisance ordinances to require properties to be kept clean and free of flammable debris and to annually abate weeds and overgrown vegetation before these materials can dry out in the spring to pose a wildfire hazard (Fresno Municipal Code Chapter 10, Article 6 relating to public nuisance abatement). The Planning and Development Department Code Enforcement Division and Department of Public Utilities Community Sanitation Division coordinate their efforts to enforce the nuisance abatement regulations and provide cleanup services when property owners do not take care of matters themselves.

City of Fresno Emergency Operations Plan, 2015, Updated 2015

The City of Fresno Emergency Operations Plan (EOP) addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, excessive heat/cold, power outages, and national security emergencies in or affecting the City of Fresno. The Plan, which was updated in 2015, does the following:

- Establishes the emergency management organization required to mitigate any significant emergency or disaster affecting the City of Fresno.
- Identifies the policies, responsibilities, and procedures required to protect the health and safety of City communities, public and private property, and the environment from natural or technological disasters.
- Establishes the operational concepts and procedures associated with initial response operations to emergencies, the extended response operations, and the recovery process.

The EOP is designed to establish the framework for implementation of the California Standardized Emergency Management System/National Incident Management System for the City of Fresno, which is located within the California Governor's Office of Emergency Services' Mutual Aid Region V. It is intended to facilitate multi-agency and multi-jurisdictional coordination, particularly between the City of Fresno and the Fresno County Operational Area, including special districts and state agencies, in emergency operations. This plan will be used in conjunction with the Fresno County EOP and the State of California Emergency Plan. The plan is designed to guide the reader or user through each phase of an emergency: preparedness, response, recovery, and mitigation.

Other Plans and Policies

Other hazard mitigation-related policies and plans in place in and observed by the City of Fresno include the following:

- California Code of Regulations Title 23 administrative law for development and use of land in designated floodway areas along the San Joaquin River administered by the Central Valley Flood Protection Board, staffed by the California Department of Water Resources.
- Standards for constructing and maintaining drainage basins and ponds to prevent mosquito breeding and to provide for mosquito control district access for inspection and abatement activities (jointly promulgated by the Planning and Development Department and Public Works Department in fall of 2005).
- Dam failure inundation plans prepared and administered by the U.S. Bureau of Reclamation, the U.S. Army Corps of Engineers, Fresno Metropolitan Flood Control District, Southern California Edison, and Pacific Gas and Electric Company.
- The California Environmental Quality Act, overseen by the Fresno City Attorney's Office and administered by several City departments, requires consideration of health and safety impacts as they may relate to projects, which are defined as any action that may result in a change in the physical environment and that would include public facilities, and private development, and even adoption/amendment of land use plans and ordinances. An analysis of every project is conducted by the appropriate City department (the Development and Resource Management Department does the bulk of these analyses). Inquiries regarding project sites and features are distributed to departments and outside agencies that may have knowledge of, or which may regulate, aspects of the proposed project. The information obtained from these requests for comment and from other staff research is compiled into an informational document for decision-makers and the public. The information is also used to develop a list of mitigation actions to reduce or abate potential adverse impacts of the project. For those projects which may involve federal funds or require federal approvals, a parallel National Environmental Policy Act assessment is also prepared by the City.
- The Development and Resource Management Department administers regulations in the California Building Code and in Uniform Electrical, Plumbing, and Mechanical Codes as those codes are modified through adoption by the state and City. Plan check and inspection activities of the Department ensure structural soundness and compliance with seismic and other regulations.

E.4.2 Administrative/Technical Mitigation Capabilities

Table E.17 identifies the personnel responsible for activities related to mitigation and loss prevention in Fresno.

Table E.17: City of Fresno's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Planning and Development Department (planners), Department of Public Utilities (engineers), Public Works Department (engineers), Fresno Metropolitan Flood Control District (engineers)
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Planning and Development Department (engineers), Department of Public Utilities (engineers), Public Works Department (engineers), Fresno Metropolitan Flood Control District (engineers)
Planner/engineer/scientist with an understanding of natural hazards	Yes	Planning and Development Department (planners and engineers), Department of Public Utilities (engineers), Public Works Department (engineers), Fresno Metropolitan Flood Control District (engineers)
Personnel skilled in GIS	Yes	Planning and Development Department, Department of Public Utilities, Public Works Department, Information Services Department
Full time building official	Yes	Planning and Development Department
Floodplain administrator	Yes	Planning and Development Department
Emergency manager	Yes	Fresno Fire Department
Grant writer	Yes	Planning and Development Department, Police Department, Public Works Department, Fire Department
Other personnel	Yes	California registered geologist (Department of Public Utilities), California registered environmental health specialist (Planning and Development Department), licensed water and wastewater treatment operators
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	State Emergency Alert System is coordinated by emergency management team through the National Weather Service
Other	Yes	Emergency notification of San Joaquin River bottom residents in conjunction with the U.S. Bureau of Reclamation and Fresno County

E.4.3 Fiscal Mitigation Capabilities

Table E.18 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table E.18: City of Fresno's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	Geographically restricted to designated portions of Fresno based on area income
Capital improvements project funding	Yes	Budgeted out of utility fees and often related to issuance of bonds; City also obtains grants, shares of state gas tax and sales taxes, ballot measure tax revenue, etc.
Authority to levy taxes for specific purposes	Yes	Subject to California Proposition 218 restrictions on new and increased assessments
Authority to levy fees and fines, and to recover costs through lien processes, for nuisance abatement	Yes	Subject to an appeal process that involves administrative law judges retained by the City
Fees for water, sewer, gas, or electric services	Yes	Water, sewer, solid waste, code enforcement (cleanup)

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Impact fees for new development	Yes	Master Fee Schedule as originally chartered under the City's Urban Growth Management Ordinance
Incur debt through general obligation bonds	Yes	Would need vote of the taxpayers to enact.
Incur debt through special tax bonds	Yes	Special Assessment Districts that issue debt and incur the debt but the City only administers
Incur debt through private activities	Yes	The City has the capability of doing them and have in the past
Withhold spending or public infrastructure investment in hazard prone areas	Yes	The Department of Public Utilities retains jurisdiction over water and sewer services and determines its appropriate service areas with risk to facilities being one of the factors leading to a decision not to extend services to River bottom properties

E.4.4 Mitigation Outreach and Partnerships

The Fresno Department of Public Utilities, in conjunction with other agencies, provides water conservation and stormwater quality protection public information programs. The Fire Department provides personal preparedness outreach for heat and freeze emergencies and shelter-in-place information for hazardous materials emergencies. Additionally, the City has developed public service announcements for smoke detector battery life, canal safety, and fireworks safety.

The City's Joint Information System disseminates information in Spanish, and the City can obtain translation services for other languages when necessary. A Joint Information Center plan is an annex to the City of Fresno Emergency Operations Plan and provides comprehensive guidance for early warning notification in all languages and specifically the Americans with Disabilities Act (ADA) community.

Preparedness Exercises afford the opportunity to include the City of Fresno ADA Committee. Members of the committee and volunteers from the ADA community role play for realistic first responder training.

E.4.5 Other Mitigation Efforts

- The City is a certified StormReady community through the National Weather Service.
- The Fire Department, Police Department, and Solid Waste Division are nationally accredited.
- The City has installed security systems for the wastewater treatment facility and for its surface water treatment plant. Generators are installed in critical groundwater pumping stations and these facilities are secured.

E.4.6 Opportunities for Enhancement

Based on the capabilities assessment, the City of Fresno has several existing mechanisms in place that already help to mitigate hazards. In addition to these existing capabilities, there are also opportunities for the City to expand or improve on these policies and programs to further protect

the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Fresno will lead to more informed staff members who can better communicate this information to the public. In addition, the City could work to improve the CRS rating through additional floodplain management program enhancements. This could further lower the cost of flood insurance for residents.

E.5 Mitigation Strategy

E.5.1 Mitigation Goals and Objectives

The City of Fresno adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies. The Public Works Department may utilize the hazard information when implementing Capital Improvement projects and the Planning and Development Department may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As noted in Chapter 7 Plan Implementation, the HMPC representatives from Fresno will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Continued Compliance with the National Flood Insurance Program

In addition to the mitigation actions identified herein the City will continue to comply with the National Flood Insurance Program as specified in General Plan Policy NS-3-j: *"National Flood Insurance Program. Continue to participate in the National Flood Insurance Program (NFIP) by ensuring compliance with applicable requirements."*

E.5.2 Completed 2009 Mitigation Actions

The City of Fresno did not complete any of the mitigation actions identified in the 2009 plan. However, implementation is in progress for several of these actions and will be continued as part of the mitigation strategy for this plan update.

E.5.3 Mitigation Actions

The planning team for the City of Fresno identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how each action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and schedule are also included.

In addition to implementing the mitigation actions below the City of Fresno will be participating in the county-wide, multi-jurisdictional action of developing and conducting a multi-hazard seasonal public awareness program. The county-wide project will be led by the County in

partnership with all municipalities and special districts. The City agrees to help disseminate information on hazards provided by the County. More information on the action can be found in the base plan Chapter 5 Mitigation Strategy (see Section 5.3.3 Multi-Jurisdictional Mitigation Actions, Action #1. Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program).

1. Establish Post-Disaster Action Plan for City Continuity of Operations Plan

Hazard(s) Addressed: Multi-Hazard: dam failure, earthquake, flood, severe weather, wildfire, hazardous materials

Issue/Background: Establish a post-disaster action plan to be part of the City of Fresno Continuity of Operations Plan (COOP) that will include the following elements:

- Procedures for public information
- Post-disaster damage assessment
- Grant writing
- Code enforcement
- Redundant operations

The plan will also include annexes from local businesses and large employers to improve economic and employment recovery. The plan will also identify a mechanism for the City to help businesses without COOPs develop a COOP to be incorporated, as an annex, into the City's Emergency Operations Plan.

Other Alternatives: No action

Responsible Office: City of Fresno Emergency Preparedness Officer

Priority (High, Medium, Low): High

Cost Estimate: $150,000

Potential Funding: Local funds, grants

Benefits (Avoided Losses): This will improve response/recovery during an event through pre-planning. A City COOP and local business COOPs will reduce the impact of a disaster to the local economy and employment.

Schedule: Long term

Status: 2009 project, implementation in progress

2. Improve the City's Capabilities for Sheltering Animals in a Disaster

Hazard(s) Addressed: Multi-Hazard: dam failure, earthquake, flood, severe weather, wildfire, hazardous materials

Issue/Background: During a disaster, not only do people need to be rescued, but their pets do also. Hurricane Katrina showed the nation that shelters do not typically allow pets, so pets may be left behind when their owners evacuate. The care of the animals left behind falls to local animal shelters. Currently, the SPCA Animal Shelter does not have the supplies to handle a large scale animal emergency. The City has approximately 18,000 licensed dogs. If a disaster occurred, they would only be able to house a small percentage of them. Overcrowding of animals usually causes diseases and loss of animal life. Purchasing new cages would alleviate some of the overcrowding created by a disaster.

Other Alternatives: Ask other agencies for supplies, if they have them available.

Responsible Office: City of Fresno Emergency Preparedness Officer

Priority (High, Medium, Low): High

Cost Estimate: $50,000

Potential Funding: General fund

Benefits (Avoided Losses): This will cut down on the spread of disease and animal loss during an emergency or disaster.

Schedule: Short term

Status: 2009 project, implementation in progress

3. Train and Certify City Inspectors to Conduct Post-Disaster Damage Assessment

Hazard(s) Addressed: Multi-Hazard: dam failure, earthquake, flood, severe weather, wildfire, hazardous materials

Issue/Background: City inspectors play a vital role in post-disaster building assessment and damage assessment. Pre-training and certification is vital in response and recovery to reduce loss of life, relocate populations, and ensure the rebuilding of local economies.

Other Alternatives: No action

Responsible Office: City of Fresno Emergency Preparedness Officer and Planning and Development Department

Priority (High, Medium, Low): High

Cost Estimate: $250,000

Potential Funding: Grants

Benefits (Avoided Losses): This will improve response/recovery during an event through pre-training and certification of individuals responsible for performing assessment of structures and facilities impacted by disasters. Certification will also allow qualified staff to mobilize with the State of California Office of Emergency Services (Region 5) Urban Search and Rescue Task Force.

Schedule: Long term

Status: 2009 project, implementation not yet started

4. Implement a Flood Awareness Program for the Public

Hazard(s) Addressed: Flood

Issue/Background: The City needs a program to educate flood-prone property owners along the San Joaquin River and in frequent annual flooding areas about the flood threat and how best to prepare, mitigate, and insure their properties.

Other Alternatives: No action

Responsible Office: City of Fresno Emergency Preparedness Officer and Planning and Development Department

Priority (High, Medium, Low): Medium

Cost Estimate: $15,000/year

Potential Funding: General fund, grants

Benefits (Avoided Losses): This will prevent the loss of human life and economic and property losses.

Schedule: Long term

Status: 2009 project, implementation not yet started

5. Southwest Fresno – Recycled Water Distribution System Construction

Hazard(s) Addressed: Drought

Issue/Background: In 2009, the State of California adopted a recycled water policy establishing a mandate to increase the use of recycled water in California by 200,000 acre-feet per year by 2020 and an additional 300,000 acre-feet per year by 2030. The Recycled Water Master Plan prepared by the City of Fresno, Department of Public Utilities (DPU), identifies opportunities to assist with compliance of this law by reducing groundwater pumping and replacing groundwater with recycled water for non-potable purposes (i.e. outdoor irrigation, dust control, fountains, etc.). On April 11, 2013, the Council adopted the Recycled Water Master Plan and associated environmental documents.

In 2017, the DPU commissioned a 5 MGD Tertiary Treatment Facility at the Fresno-Clovis Regional Wastewater Treatment Facility. DPU is currently constructing a Recycled Water Distribution System in Southwest Fresno to deliver recycled water to parks, cemeteries, schools, agricultural uses, etc., to offset potable water irrigation demands. This will help mitigate drought by enabling the use of recycled water for certain uses instead of tapping potable water supplies.

Other Alternatives: DPU has a Water Shortage Contingency Plan (WSCP) which was updated in the City of Fresno's 2015 Urban Water Management Plan to manage water shortages including drought conditions. The WSCP consists of four stages allowing the City to ultimately reduce its water demand to a level commensurate with the water supplies available to a maximum reduction of 50 percent.

Responsible Office: City of Fresno Department of Public Utilities

Priority (High, Medium, Low): High

Cost Estimate: $75,000,000

Potential Funding: California State Water Resources Control Board – Clean Water State Revolving Fund

Benefits (Avoided Losses): Reduced ground water pumping by using recycled water for non-potable purposes.

Schedule: Ongoing with completion in 2019

Status: New project

6. Sustainable Groundwater Management Act Compliance including Groundwater Sustainability Planning and Implementation

Hazard(s) Addressed: Drought

Issue/Background: The Kings subbasin underlays the City of Fresno and like many groundwater basins throughout the State, this subbasin is in overdraft condition with underground aquifers adversely impacted by overuse. Such impacts include significant decline in water storage and water levels, degradation of water quality, and land subsidence resulting in the permanent loss of storage capacity. The Sustainable Groundwater Management Act (SGMA) provides for the establishment of local Groundwater Sustainability Agencies (GSAs) to manage groundwater sustainability within groundwater subbasins defined by the California Department of Water Resources (DWR). The City of Fresno has become a joint power authority of the North Kings Groundwater Sustainability Agency, other members of the Agency include the County of Fresno, City of Kerman, City of Clovis, Biola Community Services District, Garfield Water District and International Water District. As a member of the North Kings GSA, the City of Fresno is required to participate in the development and implementation, no later than January 31, 2020, of a

Groundwater Sustainability Plan (GSP) to ensure a sustainable yield of groundwater, without causing undesirable results. Failure to comply with that requirement could result in the State asserting its power to manage local groundwater resources. Participation in the North Kings GSA and the implementation of a GSP will allow the City to maintain sustainable groundwater supplies while providing insurance against periods of long-term drought, a high significance hazard for the City of Fresno.

Other Alternatives: None, compliance required by law, failure to meet requirements will result in State intervention and oversight.

Responsible Office: City Engineer and North Kings GSA

Priority (High, Medium, Low): High

Cost Estimate: Varies by GSA for preparation of the required GSP. Further expenses are anticipated to be accrued for the planning and construction of groundwater recharge projects.

Potential Funding: Property owner assessments along with grant funding opportunities from the State.

Benefits (Avoided Losses): Preparation and implementation of the GSP by the respective GSAs will result in the management of groundwater in a manner that is sustainable and avoids undesirable results as defined by the California State Department of Water Resources.

Schedule: GSAs must complete and submit the required GSP to DWR by January 31, 2020, which is to be fully implemented and result in sustainability of the groundwater basin, with no undesirable effects, by the year 2040.

Status: New project in 2018

Attachment 5
Notice of Public Hearing

Notice of Public Hearing

City of Fresno

Draft 2020 Urban Water Management Plan,

Draft 2020 Water Shortage Contingency Plan, &

Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed"

The City of Fresno (City) will hold a public hearing at 10:05 A.M. on Thursday, July 15, 2021, at the City Council Chambers at the City Hall located at 2600 Fresno Street to receive public comments on the City's Draft 2020 Urban Water Management Plan (2020 UWMP), the City's Draft 2020 Water Shortage Contingency Plan (2020 WSCP), and a Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" (Addendum). The Draft 2020 UWMP addresses current and projected water supply availability and reliability and provides a comparison with current and projected water demands through the year 2045. The Draft 2020 WSCP details the City's potential actions in response to a severe water shortage or water supply emergency. Sections 1.3, 1.4, 1.5, and 1.8 of the Draft 2020 WSCP were revised from a version of the document that was previously released on Monday, July 28, 2021. The Draft Addendum discusses the City's reduced reliance on the Sacramento-San Joaquin River Delta surface water.

Interested citizens are invited to make public comments on the three documents at the public hearing. Services of an interpreter and additional accommodations such as assistive listening devices can be made available. Requests for accommodations should be made more than five working days but no later than 48 hours prior to the scheduled hearing. Please contact Mr. Peter Maraccini at 559-621-1603 or Peter.Maraccini@Fresno.gov.

The three documents will be made available for public review starting July 1, 2021. Physical copies of the three documents can be found at the following Fresno County Libraries: Central Library (2420 Mariposa St.), Woodward Park Regional Library (944 E Perrin Ave.), Betty Rodriguez Regional Library (3040 N Cedar Ave.), and Sunnyside Regional Library (5566 E Kings Canyon Rd.). Electronic copies of the three documents are available online at https://www.fresno.gov/publicutilities/about-dpu/plans-reports-resources/. Documents can be provided in alternate formats upon request.

Comments may be submitted by calling Utilities Planning & Engineering at 559-621-1603, by writing to Mr. Peter Maraccini, Utilities Planning & Engineering Division, 2101 G Street

Bldg. A, Fresno, CA 93706, or by emailing at Peter.Maraccini@Fresno.gov. All written comments must be received no later than July 14, 2021, at 11:59 P.M.

Attachment 6
Resolution Approving the WSCP

RESOLUTION NO. 2021-197

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT THE 2020 WATER SHORTAGE CONTINGENCY PLAN AND AUTHORIZE THE CITY MANAGER TO DECLARE THE APPROPRIATE WATER CONSERVATION STAGES AND IMPLEMENT THE ASSOCIATED SHORTAGE RESPONSE ACTIONS

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Sections 10610, et seq., requires every urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) and update said plan at least once every five years; and

WHEREAS, Water Code Section 10632 requires every urban water supplier to prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its UWMP; and

WHEREAS, the WSCP details intended City actions to respond to water shortages; and

WHEREAS, as an urban water supplier, the City of Fresno has prepared a WSCP that complies with the requirements of the Urban Water Management Planning Act; and

WHEREAS, the City consulted with, and requested comments from, regional water related agencies such as the County of Fresno, Fresno Irrigation District, the City of Clovis, etc., as required by Water Code Section 10641; and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft 2020 WSCP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library,

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021, and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft 2020 WSCP would be held in Council Chambers at which time public comment on the plan would be received, as required by Water Code Section 10642; and

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the 2020 WSCP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts the 2020 Water Shortage Contingency Plan.

2. The City Manager, or designee, is hereby authorized and directed to file the City of Fresno 2020 Water Shortage Contingency Plan with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

3. The City Manager, or designee, is hereby authorized to declare the appropriate Water Conservation Stages outlined in the 2020 Water Shortage Contingency Plan and implement the associated shortage response actions specified for the appropriate Water Conservation Stage in the Water Shortage Contingency Plan.

* * * * * * * * * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, BRIANA PARRA, Interim City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 15th day of July, 2021.

AYES :Arias, Esparza, Karbassi, Maxwell, Chavez
NOES :None
ABSENT :Bredefeld, Soria
ABSTAIN :None

Mayor Approval: July 19th, 2021
Mayor Approval/No Return: N/A, 2021
Mayor Veto: N/A, 2021
Council Override Veto: N/A, 2021

BRIANA PARRA, CMC
Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-197, entitled ***RESOLUTION – **Adopting 2020 Water Shortage Contingency Plan and authorizing the City Manager to declare the appropriate water conservation stages and implement the associated shortage response actions (Subject to Mayor's veto).** Item 10:05 A.M. (4), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes :
Noes :
Absent :
Abstain :

RECEIVED
2021 JUL 19 P 4:52
CITY OF FRESNO
CITY CLERK'S OFFICE

K

Outreach Events

2015 Outreach Events		
Date	Name of Event	Description
Jan	"Creating a Water-wise Landscape: Seven Steps to Follow our Climate"	Landscape Workshop by Susan Stiltz as SPEAKER for City employees at City Hall 2600 Fresno St 93721.Distribute literature E. Social media: sent email with flier to City employees. Contact: Melany Felton. LITERATURE
Jan	Fresno Chinese New Year Parade	Outreach booth providing water saving info & rebate information
March	Spring Festival - Clovis Botanical Garden	Outreach booth providing water saving info & rebate information
April	Home Depot - Riverpark Kid's Day Spring Event	Hands on activity for kids, drought tolerant plants planting, literature for adults
April	America's Party for the Planet	Outreach booth providing water saving info & rebate information
April	Sequoia Middle School Outdoor Club	Outreach booth providing water saving info & rebate information
May	Spring Fling - Master Gardener	Provided literature for event held at Garden of the Sun
May	Madden Library Water-wise Plant Exchange event	Water wise garden speaker, materials handed out
May	Water-Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
June	Kids Water Camp	Large one day event, hands on activites, educational for kids 3rd grade (all elementary schools invited to participate)
July	Fresno Home Remodeling & Decorating Show	Fresno Fairgrounds 3 day event. Outreach booth with visual displays & information
Sept	Carnaval Children's Festival	Mosqueda Center Outreach booth, providing water saving information & rebates
Sept	Fresno State partnership	Susan Hawksworth extended education. Began planning for Feb classes with landscape specialists
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information
Nov	Fresno Fall Improvement Show	Inspiration Park Grand opening
Nov	Inspiration Park Grand opening	Outreach booth providing water saving info & rebate information

2016 Outreach Events		
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days

March	Spring Into Your Garden	Outreach booth providing water saving info & rebate information. Visual displays
April	Water Planet Day	Outreach booth providing water saving info & rebate information. Visual displays
April	8th Annual Water-Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
May	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual displays
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Dec	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Orchard St. & Grant Ave

2017 Outreach Events		
Jan	Hmong New Year	Outreach booth providing water saving info & rebate information. Hmong translator & printed materials in Hmong
Feb	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Hildago Elementary 3550 E Thomas 93702
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
March	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Leavenworth Elementary School, 4420 E Thomas

April	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Webster Elementary School, 2600 E Tyler 93701
April	9th Annual Water-Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
April	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information
May	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Slater Elementary school 4472 N Emerson 93705
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual displays
Oct	Make A Difference Day @ Chukchansi Park	Outreach booth providing water saving info & rebate information. Visual displays
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event

2018 Outreach Events		
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event
March	Spring Into Your Garden Festival	Outreach booth providing water saving info & rebate information. Visual displays
April	10th Annual Water Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
May	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days

Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual Display
Sept	Central California Women's Conference	Outreach booth providing water saving info & rebate information. Visual Display
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual Display
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event

2019 Outreach Events		
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event
March	Spring Into Your Garden Festival	Outreach booth providing water saving info & rebate information. Visual displays
April	Outreach booth @ Manchester Mall	Outreach booth providing water saving info & rebate information. Visual displays
April	Party for the Planet @ Chaffee Zoo	Outreach booth providing water saving info & rebate information. Visual displays
May	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
May	11th Annual Water Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual displays
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event

2020 Outreach Events
All Outreach Suspended

L

Notification Letters

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Shay Bakman
Bakman Water Company
PO Box 7965
Fresno, CA 93747

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Bakman:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Scott Redelfs
City of Clovis Public Utilities
155 N. Sunnyside Ave
Clovis, CA 93611

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Redelfs:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Bill Stretch
Fresno Irrigation District
2907 South Maple Ave
Fresno, CA 93725

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Stretch:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

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2101 G Street, Bldg. A
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559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Peter Sanchez
Fresno Metropolitan Flood Control District
5469 East Olive Ave
Fresno, CA 93727

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Sanchez:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

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2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Steven White
Fresno County Public Works
2220 Tulare St, 6th Floor
Fresno, CA 93721

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. White:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Jason Phillips
Friant Water Authority
4969 E. McKinley Ave, Suite 201
Fresno, CA 93727

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Phillips:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Nick Keller
Garfield Water District
PO Box 337
Clovis, CA 93613

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Keller:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
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Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Moises Ortiz
Malaga County Water District
3580 South Frank Street
Fresno, CA 93725-2511

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Ortiz:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Kassy D. Chauhan, PE
North Kings Groundwater Sustainability Agency
2907 S. Maple Avenue
Fresno, CA 93725

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mrs. Chauhan:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Jason Franklin
Pinedale County Water District
480 West Birch Ave
Pinedale, CA 93650

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Franklin:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Michael P. Jackson, PE
United States Bureau of Reclamation South-Central California Area Office
1243 N Street
Fresno, CA 93721-1813

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Jackson:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

Notice of Public Hearing

City of Fresno

Draft 2020 Urban Water Management Plan,

Draft 2020 Water Shortage Contingency Plan, &

Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed"

The City of Fresno (City) will hold a public hearing at 10:05 A.M. on Thursday, July 15, 2021, at the City Council Chambers at the City Hall located at 2600 Fresno Street to receive public comments on the City's Draft 2020 Urban Water Management Plan (2020 UWMP), the City's Draft 2020 Water Shortage Contingency Plan (2020 WSCP), and a Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" (Addendum). The Draft 2020 UWMP addresses current and projected water supply availability and reliability and provides a comparison with current and projected water demands through the year 2045. The Draft 2020 WSCP details the City's potential actions in response to a severe water shortage or water supply emergency. Sections 1.3, 1.4, 1.5, and 1.8 of the Draft 2020 WSCP were revised from a version of the document that was previously released on Monday, July 28, 2021. The Draft Addendum discusses the City's reduced reliance on the Sacramento-San Joaquin River Delta surface water.

Interested citizens are invited to make public comments on the three documents at the public hearing. Services of an interpreter and additional accommodations such as assistive listening devices can be made available. Requests for accommodations should be made more than five working days but no later than 48 hours prior to the scheduled hearing. Please contact Mr. Peter Maraccini at 559-621-1603 or Peter.Maraccini@Fresno.gov.

The three documents will be made available for public review starting July 1, 2021. Physical copies of the three documents can be found at the following Fresno County Libraries: Central Library (2420 Mariposa St.), Woodward Park Regional Library (944 E Perrin Ave.), Betty Rodriguez Regional Library (3040 N Cedar Ave.), and Sunnyside Regional Library (5566 E Kings Canyon Rd.). Electronic copies of the three documents are available online at https://www.fresno.gov/publicutilities/about-dpu/plans-reports-resources/. Documents can be provided in alternate formats upon request.

Comments may be submitted by calling Utilities Planning & Engineering at 559-621-1603, by writing to Mr. Peter Maraccini, Utilities Planning & Engineering Division, 2101 G Street Bldg. A, Fresno, CA 93706, or by emailing at Peter.Maraccini@Fresno.gov. All written comments must be received no later than July 14, 2021, at 11:59 P.M.

McClatchy

Beaufort Gazette
Belleville News-Democrat
Bellingham Herald
Bradenton Herald
Centre Daily Times
Charlotte Observer
Columbus Ledger-Enquirer
Fresno Bee
The Herald - Rock Hill
Herald Sun - Durham
Idaho Statesman
Island Packet
Kansas City Star
Lexington Herald-Leader
Merced Sun-Star
Miami Herald
el Nuevo Herald - Miami
Modesto Bee
Raleigh News & Observer
The Olympian
Sacramento Bee
Fort Worth Star-Telegram
The State - Columbia
Sun Herald - Biloxi
Sun News - Myrtle Beach
The News Tribune Tacoma
The Telegraph - Macon
San Luis Obispo Tribune
Tri-City Herald
Wichita Eagle

AFFIDAVIT OF PUBLICATION

Account #	Order Number	Identification	Order PO	Amount	Cols	Depth
59161	92995	Print Legal Ad - IPL0030763		$861.84	2	5.31

Attention: City of

City of Fresno Dept. Public Utilities
2101 G Street Bldg A
Fresno, CA 93706

PUBLIC NOTICE

Notice of Public Hearing

City of Fresno
Draft 2020 Urban Water Management Plan,

Draft 2020 Water Shortage Contingency Plan, &

Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed"

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IPL0030763
Jul 1 2021

COUNTY OF DALLAS
STATE OF TEXAS

The undersigned states:

McClatchy Newspapers in and on all dates herein stated was a corporation, and the owner and publisher of The Fresno Bee.
The Fresno Bee is a daily newspaper of general circulation now published, and on all-the-dates herein stated was published in the City of Fresno, County of Fresno, and has been adjudged a newspaper of general circulation by the Superior Court of the County of Fresno, State of California, under the date of November 28, 1994, Action No. 520058-9.
The undersigned is and on all dates herein mentioned was a citizen of the United States, over the age of twenty-one years, and is the principal clerk of the printer and publisher of said newspaper; and that the notice, a copy of which is hereto annexed, marked Exhibit A, hereby made a part hereof, was published in The Fresno Bee in each issue thereof (in type not smaller than nonpareil), on the following dates.

No. of Insertions: 1

Beginning Issue of: 07/01/2021

Ending Issue of: 07/01/2021

Isabel Capps

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: 07/01/2021

Amanda Grisham

Notary Public in and for the state of Texas, residing in Dallas County

AMANDA DAWN GRISHAM
My Notary ID # 132031326
Expires May 30, 2023

Extra charge for lost or duplicate affidavits.
Legal document please do not destroy!

McClatchy

Beaufort Gazette
Belleville News-Democrat
Bellingham Herald
Bradenton Herald
Centre Daily Times
Charlotte Observer
Columbus Ledger-Enquirer
Fresno Bee
The Herald - Rock Hill
Herald Sun - Durham
Idaho Statesman
Island Packet
Kansas City Star
Lexington Herald-Leader
Merced Sun-Star
Miami Herald
el Nuevo Herald - Miami
Modesto Bee
Raleigh News & Observer
The Olympian
Sacramento Bee
Fort Worth Star-Telegram
The State - Columbia
Sun Herald - Biloxi
Sun News - Myrtle Beach
The News Tribune Tacoma
The Telegraph - Macon
San Luis Obispo Tribune
Tri-City Herald
Wichita Eagle

AFFIDAVIT OF PUBLICATION

Account #	Order Number	Identification	Order PO	Amount	Cols	Depth
59161	95606	Print Legal Ad - IPL0031437		$861.84	2	53 L

Attention: City of

City of Fresno Dept. Public Utilities
2101 G Street Bldg A
Fresno, CA 93706

PUBLIC NOTICE

Notice of Public Hearing

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Draft 2020 Urban Water Management Plan,

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IPL0031437
Jul 8 2021

COUNTY OF DALLAS
STATE OF TEXAS

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The Fresno Bee is a daily newspaper of general circulation now published, and on all-the-dates herein stated was published in the City of Fresno, County of Fresno, and has been adjudged a newspaper of general circulation by the Superior Court of the County of Fresno, State of California, under the date of November 28, 1994, Action No. 520058-9.
The undersigned is and on all dates herein mentioned was a citizen of the United States, over the age of twenty-one years, and is the principal clerk of the printer and publisher of said newspaper; and that the notice, a copy of which is hereto annexed, marked Exhibit A, hereby made a part hereof, was published in The Fresno Bee in each issue thereof (in type not smaller than nonpareil), on the following dates.

No. of Insertions: 1

Beginning Issue of: 07/08/2021

Ending Issue of: 07/08/2021

Isabel Capps

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: 07/08/2021

Amanda Grisham

Notary Public in and for the state of Texas, residing in Dallas County

AMANDA DAWN GRISHAM
My Notary ID # 132031326
Expires May 30, 2023

Extra charge for lost or duplicate affidavits.
Legal document please do not destroy!

M

Adopting Resolutions

RESOLUTION NO. 2021-196

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Sections 10610, et seq., requires every urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) and update said plan at least once every five years; and

WHEREAS, the City adopted its current UWMP on June 23, 2016; and

WHEREAS, the requirements of an UWMP are to generally: (1) assess current and projected water supplies, (2) evaluate water demand and customer types, (3) evaluate reliability of water supplies, (4) compare demand and supply projections for a 20-year period, and (5) detail response actions in the event of a water shortage; and

WHEREAS, as an urban water supplier, the City of Fresno has prepared the UWMP to comply with the requirements of the Urban Water Management Planning Act; and

WHEREAS, the City consulted with, and requested comments from, regional water related agencies such as the County of Fresno, Fresno Irrigation District, the City of Clovis, etc., as required by Water Code Section 10641; and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft 2020 UWMP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library, Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021, and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft 2020 UWMP would be held in Council Chambers at which public comment on the plan would be received, as required by Water Code Section 10642; and

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the 2020 UWMP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts the 2020 Urban Water Management Plan.

2. The City Manager, or designee, is hereby authorized and directed to file the City of Fresno 2020 Urban Water Management Plan with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

* * * * * * * * * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, BRIANA PARRA, Interim City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 15th day of July, 2021.

AYES :Arias, Esparza, Karbassi, Maxwell, Chavez
NOES :None
ABSENT :Bredefeld, Soria
ABSTAIN :None

Mayor Approval: July 19th, 2021
Mayor Approval/No Return: N/A, 2021
Mayor Veto: N/A, 2021
Council Override Veto: N/A, 2021

BRIANA PARRA, CMC
Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-196, entitled ***RESOLUTION – Adopting 2020 Urban Water Management Plan (Subject to Mayor's veto).** Item 10:05 A.M. (3), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes	:	
Noes	:	
Absent	:	
Abstain	:	

RECEIVED
2021 JUL 19 P 4:52
CITY OF FRESNO
CITY CLERK'S OFFICE

RESOLUTION NO. 2021-197

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT THE 2020 WATER SHORTAGE CONTINGENCY PLAN AND AUTHORIZE THE CITY MANAGER TO DECLARE THE APPROPRIATE WATER CONSERVATION STAGES AND IMPLEMENT THE ASSOCIATED SHORTAGE RESPONSE ACTIONS

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Sections 10610, et seq., requires every urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) and update said plan at least once every five years; and

WHEREAS, Water Code Section 10632 requires every urban water supplier to prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its UWMP; and

WHEREAS, the WSCP details intended City actions to respond to water shortages; and

WHEREAS, as an urban water supplier, the City of Fresno has prepared a WSCP that complies with the requirements of the Urban Water Management Planning Act; and

WHEREAS, the City consulted with, and requested comments from, regional water related agencies such as the County of Fresno, Fresno Irrigation District, the City of Clovis, etc., as required by Water Code Section 10641; and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft 2020 WSCP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library,

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021, and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft 2020 WSCP would be held in Council Chambers at which time public comment on the plan would be received, as required by Water Code Section 10642; and

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the 2020 WSCP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts the 2020 Water Shortage Contingency Plan.

2. The City Manager, or designee, is hereby authorized and directed to file the City of Fresno 2020 Water Shortage Contingency Plan with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

3. The City Manager, or designee, is hereby authorized to declare the appropriate Water Conservation Stages outlined in the 2020 Water Shortage Contingency Plan and implement the associated shortage response actions specified for the appropriate Water Conservation Stage in the Water Shortage Contingency Plan.

* * * * * * * * * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, BRIANA PARRA, Interim City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 15th day of July, 2021.

AYES :Arias, Esparza, Karbassi, Maxwell, Chavez
NOES :None
ABSENT :Bredefeld, Soria
ABSTAIN :None

Mayor Approval: July 19th, 2021
Mayor Approval/No Return: N/A, 2021
Mayor Veto: N/A, 2021
Council Override Veto: N/A, 2021

BRIANA PARRA, CMC
Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-197, entitled ***RESOLUTION – **Adopting 2020 Water Shortage Contingency Plan and authorizing the City Manager to declare the appropriate water conservation stages and implement the associated shortage response actions (Subject to Mayor's veto).** Item 10:05 A.M. (4), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes :
Noes :
Absent :
Abstain :

RECEIVED
2021 JUL 19 P 4:52
CITY OF FRESNO
CITY CLERK'S OFFICE

RESOLUTION NO. 2021-198

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT APPENDIX L - ADDENDUM TO THE CITY OF FRESNO'S 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, the City of Fresno (City) contracts with the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) Friant Division for an annual supply of 60,000 acre-feet of Class 1 surface water; and,

WHEREAS, the CVP was developed through an agreement with the Exchange Contractors that have historic pre-1914 San Joaquin River water rights; and,

WHEREAS, the Exchange Contractors receive water from the Sacramento-San Joaquin River Delta (Delta) in exchange for the CVP Friant Division water; and,

WHEREAS, during times of severe drought when the Exchange Contractors don't receive their full allocations from the Delta, the Exchange Contractors can call on their historic pre-1914 San Joaquin River water rights to fulfill their allocations, which reduces CVP Friant Division allocations to the City; and,

WHEREAS, due to the indirect connection of the City's Class 1 surface water allocation from the CVP Friant Division to the Exchange Contractors allocation from the Delta, the City is required to demonstrate consistency with the Delta Plan established via the Sacramento-San Joaquin Delta Reform Act of 2009; and,

WHEREAS, Delta Plan Policy WR P1 requires urban water suppliers to demonstrate reduced Delta reliance in the 2015 and 2020 Urban Water Management Plans (UWMPs); and,

WHEREAS, the City's 2015 UWMP did not include information regarding Delta

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self -Reliance; and

WHEREAS, the City prepared the 2015 UWMP following the Department of Water Resources (DWR) UWMP Guidebook 2015, which made such reporting optional; and,

WHEREAS, the DWR UWMP Guidebook 2020 instructs urban water suppliers to amend 2015 UWMP with reporting on reduced Delta reliance if not already included; and,

WHEREAS, the City has prepared Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" that follows the instructions of the DWR UWMP Guidebook 2020, fulfills the requirements of the Delta Plan Policy WR P1, and complies with the requirements of the Urban Water Management Planning Act; and,

WHEREAS, the City desires to amend its 2015 UWMP to incorporate Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed;" and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft Appendix L – Addendum to the 2015 UWMP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library, Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021 and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft Appendix L – Addendum to the 2015 UWMP would be held in Council Chambers at which time public comment on the draft Addendum would be received, as required by Water Code Section 10642; and,

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the draft Appendix L Addendum to the 2015 UWMP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed."

2. The City Manager, or designee, is hereby authorized and directed to file Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

* * * * * * * * * * * * * * *

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COUNTY OF FRESNO) ss.
CITY OF FRESNO)

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ABSTAIN :None

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Mayor Approval/No Return: N/A, 2021
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Council Override Veto: N/A, 2021

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Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-198, entitled ***RESOLUTION – Adopting Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan (Subject to Mayor's veto). Item 10:05 A.M. (5), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes :
Noes :
Absent :
Abstain :

RECEIVED
2021 JUL 19 P 4:52
CITY OF FRESNO
CITY CLERK'S OFFICE

APPENDIX C

VTTM 6294 – WSA – CONSISTENCY WITH DWR GUIDELINES

TTM 23-03075 RJY Holdings, LLC WSA – Consistency with DWR Guidelines

Guidelines Section Number and Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
Section 1 (page 2). Does SB 610 or SB221 apply to the proposed project?	Is the project subject to SB 610? Is the project subject to CEQA (Water Code §10910(a)? If yes, continue.	WSA Section 1.1. Yes, the project is subject to SB610 and CEQA.
	Is it a "Project" as defined by Water Code §10912(a) or (b)? If yes, to comply with SB 610 go to Section 2.0, page 4.	WSA Section 1.1. Yes, the Project is considered to meet the definition of "project" per Water Code §10912(a) or (b).
	Is the project subject to SB 221? Does the tentative map include a "subdivision" as defined by Government Code §66473.7(a)(1)? If no, stop.	No
Section 2.0 (page 4). Who will prepare the SB 610 analysis?	Is there a public water system ("water supplier") for the project (Water Code §10910(b)? If no, go to Section 3.0, page 6.	WSA Section 2.1. Yes, the project site will connect to a public water system.
Section 3.0 (page 6). Has an assessment already been prepared that includes this project?	Has this project already been the subject of an assessment (Water Code §10910(h)? If no, go to Section 4.0, page 8.	No, the Project has not been the subject of an assessment.
Section 4.0 (page 8). Is there a current Urban Water Management Plan?	Is there an adopted urban water management Plan (Water Code §10910(c)? If yes, continue. If yes, the information from the UWMP related to the proposed water demand for the project may also be used for carrying out Section 5.0, Steps 1 and 2, Section 7; proceed to Section 5, page 10 of the Guidelines.	Yes, there is an Urban Water Management Plan (UWMP) for the proposed project location described in WSA Section 3.2.
	Is the project water demand for the project accounted for in the most recent UWMP (Water Code §10910(c)(2)? If no, go to Section 5.0, page 10.	Yes
Section 5.0 (page 10). What information should be included in an assessment?	Step One (page 13). Documenting wholesale water supplies.	The Project is not a retail water supplier and would not include the use of wholesale water supplies.
	Step Two (page 17). Documenting Supply if Groundwater is a Source.	The proposed water supply wells are located within the City of Fresno. WSA Sections 1.3, 2.3 and 3.2.

Guidelines Section Number and Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
	Specify if a groundwater management plan or any other specific authorization for groundwater management for the basin has been adopted and how it affects the water supplier's use of the basin.	WSA Section 3.2 The water supply wells are located within the North Kings Groundwater Sustainability Agencies which includes the City of Fresno.
	Description and analysis of the amount and location of groundwater pumped by the water supplier for the past five years. Include information on proposed pumping locations and quantities. The description and analysis is to be based on information that is reasonably available, including, but not limited to, historic use records from DWR.	City of Fresno historic records are included in WSA Section 3.0. WSA Section 1.3 provides a description of the Project's water requirements.
	Analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the water supplier.	WSA Section 3.2. The quantity of water available in the City of Fresno is sufficient for the Project.
	Step 3 (page 21). Documenting project demand (Project Demand Analysis).	WSA Section 1.3. Addresses the Project water demands
	Step 4 (page 26). Documenting dry year(s) supply.	WSA Section 3.2. Addresses water supply availability including during dry years.
	Step 5 (page 31). Documenting dry year(s) demand.	WSA Section 3.2 addresses annual demands, including dry year scenarios.
Section 6.0 (page 33). Is the projected water supply sufficient or insufficient for the proposed project		WSA Section 4.0 summarizes how the identified water supply/supplies are considered sufficient for the Project.
Section 7.0 (page 35). If the projected supply is determined to be insufficient. Section 8.0 (page 38). Final SB 610 assessment actions by lead agencies.	Does the assessment conclude that supply is "sufficient"? If no, continue. The lead agency shall review the WSA and must decide whether additional water supply information is needed for its consideration of the proposed project. The lead agency "shall determine, based on the entire record, whether projected water supplies will be	WSA Section 4.0 concludes that sufficient water supplies are available for the Project. The WSA for the Project must be approved prior to or in concurrence with the EIR.

Guidelines Section Number and Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
	sufficient to satisfy the demands of the project, in addition to existing and planned future uses."	
	The description of the groundwater basin may be excerpted from the groundwater management plan, from DWR Bulleting 118, California's Ground Water, or from some other document that has been published and that discusses the basin boundaries, type of rock that constitutes the aquifer, variability of the aquifer material, and total groundwater in storage (average specific yield times the volume of the aquifer).	WSA Section 2.2 provides a description of the groundwater basin characteristics using all available resources, including DWR Bulletin 118.
	In an adjudicated basin the amount of water the urban supplier has the legal right to pump should be enumerated in the court decision.	Basin is not adjudicated.
	The Department of Water Resources has projected estimates of overdraft, or "water shortage", based on projected amounts of water supply and demand (basin management) are projected by the Watermaster agency (AVEK) in WSA Section 3.2, the hydrologic region level in	Basin groundwater resources are discussed in WSA Section 2.3.
	Bulletin 160, California Water Plan Update. Estimates at the basin or subbasin level will be projected for some basins in Bulletin 118. If the basin has not been evaluated by DWR, data that indicate groundwater level trends over a period of time should be collected and evaluated.	
	If the evaluation indicates an overdraft due to existing groundwater extraction, or	WSA Section 3.2. The referenced and Appendicized City of Fresno 2020 Urban

Guidelines Section Number and Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
	projected increases in groundwater extraction, describe actions and/or program designed to eliminate the long term overdraft condition.	Water Master Plan describes in detail the subject actions and programs.

ACOUSTICAL ANALYSIS

TRACT 6294
FRESNO, CALIFORNIA

WJVA Project No. 20-015

PREPARED FOR

LENNAR HOMES OF CALIFORNIA
8080 NORTH PALM AVENUE, SUITE 110
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PREPARED BY

WJV ACOUSTICS, INC.
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MARCH 19, 2020

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INTRODUCTION

The project is a proposed 185-lot single-family residential development to be located in Fresno, California. The project site is located at the southeast corner of North Grantland Avenue and north of West Barstow Avenue. The City of Fresno has requested an acoustical analysis to quantify project site noise exposure and determine noise mitigation requirements. This analysis, prepared by WJV Acoustics, Inc. (WJVA), is based upon a project site plan prepared by Yamabe & Horn Engineering (dated 1/10/20), traffic data provided by the Fresno Council of Governments (Fresno COG) and the findings of on-site noise level measurements. Revisions to the site plan may affect the findings and recommendations of this report. The site plan is provided as Figure 1.

Appendix A provides a description of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported are in A-weighted decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighting, as it provides a high degree of correlation with human annoyance and health effects. Appendix B provides typical A-weighted sound levels for common noise sources.

NOISE EXPOSURE CRITERIA

The City of Fresno General Plan Noise Element (adopted 12/18/14) provides noise level criteria for land use compatibility for both transportation and non-transportation noise sources. The General Plan sets noise compatibility standards for transportation noise sources in terms of the Day-Night Average Level (L_{dn}). The L_{dn} represents the time-weighted energy average noise level for a 24-hour day, with a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The L_{dn} represents cumulative exposure to noise over an extended period of time and are therefore calculated based upon *annual average* conditions. Table I provides the General Plan noise level standards for transportation noise sources.

TABLE I

CITY OF FRESNO GENERAL PLAN NOISE LEVEL STANDARDS
TRANSPORTATION (NON-AIRCRAFT) NOISE SOURCES

Noise-Sensitive Land Use	Outdoor Activity Areas[1]	Interior Spaces	
	L_{dn}/CNEL, dB	L_{dn}/CNEL, dB	L_{eq} dB[2]
Residential	65	45	---
Transient Lodging	65	45	---
Hospitals, Nursing Homes	65	45	---
Theaters, Auditoriums, Music Halls	---	---	35
Churches, Meeting Halls	65	---	45
Office Buildings	---	---	45
Schools, Libraries, Museums	---	---	45

1 Where the location of the outdoor activity areas is unknown or is not applicable, the exterior noise level standard shall be applied to the property line of the receiving land use.

2 As determined for a typical worst-case hour during periods of use.

Source: City of Fresno General Plan

Additionally, Implementing Policy NS-1-h of the noise element requires that interior noise levels attributable to exterior transportation noise sources not exceed 45 dB L_{dn}. The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

PROJECT SITE NOISE EXPOSURE

The project site is located southeast of North Grantland Avenue and north of West Barstow Avenue, in Fresno, California. The project site is exposed traffic noise. The distance from center of the backyards of the closest proposed lots to the centerline of North Grantland Avenue is approximately 75 feet. The distance from the center of the backyards of the closest proposed lots to West Barstow Avenue is approximately 120 feet.

Traffic Noise Exposure

Noise exposure from traffic on North Grantland Avenue and West Barstow Avenue was calculated for existing and future (2035) conditions using the FHWA Traffic Noise Model and traffic data obtained from Fresno COG.

WJVA utilized the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA Model is a standard analytical method used for roadway traffic noise calculations. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within ±1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Noise level measurements and concurrent traffic counts were conducted by WJVA staff within the project site on March 16, 2020. The purpose of the measurement was to evaluate the accuracy of the FHWA Model in describing traffic noise exposure within the project site. One measurement site was located within the project site at a distance of approximately 60 feet from the centerline of North Grantland Avenue. The speed limit posted in the project vicinity along both roadways was 40 mph (miles per hour). The project vicinity and noise monitoring site location are provided as Figure 2. A photograph showing the North Grantland Avenue noise measurement site is provided as Figure 3.

Noise monitoring equipment consisted of Larson-Davis Laboratories Model LDL-820 sound level analyzer equipped with a B&K Type 4176 1/2" microphone. The equipment complies with the specifications of the American National Standards Institute (ANSI) for Type I (Precision) sound level meters. The meter was calibrated in the field prior to use with a B&K Type 4230 acoustic calibrator to ensure the accuracy of the measurements. The microphone was located on a tripod at 5 feet above the ground. The project site presently consists of undeveloped land and a portion is currently used for industrial purposes.

Noise measurements were conducted in terms of the equivalent energy sound level (L_{eq}). Measured L_{eq} values were compared to L_{eq} values calculated (predicted) by the FHWA Model using as inputs the traffic volumes, truck mix and vehicle speed observed during the noise measurements. The results of the comparison are shown in Table II.

From Table II it may be determined that the traffic noise levels predicted by the FHWA Model were 1.4 dB higher than those measured for the conditions observed at the time of the noise measurements for North Grantland Avenue. This is considered to be reasonable agreement with the model and therefore no adjustments to the model are necessary.

TABLE II

COMPARISON OF MEASURED AND PREDICTED (FHWA MODEL) NOISE LEVELS TRACT 6294 FRESNO

	N. Grantland Ave.
Measurement Start Time	9:50 a.m.
Observed # Autos/Hr.	216
Observed # Medium Trucks/Hr.	36
Observed # Heavy Trucks/Hr.	0
Observed Speed (MPH)	40
Distance, ft. (from center of roadway)	60
L_{eq}, dBA (Measured)	61.9
L_{eq}, dBA (Predicted)	60.5
Difference between Predicted and Measured L_{eq}, dBA	**-1.4**

Note: FHWA "soft" site assumed for calculations.
Source: WJV Acoustics, Inc.

Annual Average Daily Traffic (AADT) data for North Grantland Avenue and West Barstow Avenue in the project vicinity was obtained from Fresno COG. Truck percentages and the day/night distribution of traffic were estimated by WJVA, based upon previous studies conducted in the project vicinity since project-specific data were not available from government sources. A speed limit of 40 mph was assumed for both roadways. Table III summarizes annual average traffic data used to model noise exposure within the project site.

TABLE III

TRAFFIC NOISE MODELING ASSUMPTIONS
TRACT 6294, FRESNO

	N. Grantland Ave.		W. Barstow Ave.	
	Existing	2035	Existing	2035
Annual Avenue Daily Traffic (AADT)	8,255	4,946	2,397	5,923
Day/Night Split (%)	90/10		90/10	
Assumed Vehicle Speed (mph)	40		40	
% Medium Trucks (% AADT)	2		2	
% Heavy Trucks (% AADT)	1		1	

Sources: Fresno COG
WJV Acoustics, Inc.

Using data from Table III, the FHWA Model, annual average traffic noise exposure was calculated for the closest proposed backyards from North Grantland Avenue and West Barstow Avenue. The calculated noise exposures for existing and future (2035) traffic conditions for the closest proposed setbacks to North Grantland Avenue were approximately 62 dB L_{dn} and 59 dB L_{dn}, respectively. The calculated noise exposures for existing and future (2035) traffic conditions for the closest proposed setbacks to West Barstow Avenue were approximately 53 dB L_{dn} and 57 dB L_{dn}, respectively. Such noise exposure levels are below the City's 65 dB L_{dn} exterior noise level standard and further mitigation is therefore not required. It should be noted, the decrease in traffic volume along North Grantland Avenue for future (2035) conditions is the result of the future extension of Veterans Boulevard, in the project vicinity.

Interior Noise Exposure:

The City of Fresno interior noise level standard is 45 dB L_{dn}. The worst-case noise exposure within the proposed residential development would be approximately 62 dB L_{dn} (existing conditions). This means that the proposed residential construction must be capable of providing a minimum outdoor-to-indoor noise level reduction (NLR) of approximately 17 dB (62-45=17).

A specific analysis of interior noise levels was not performed. However, it may be assumed that residential construction methods complying with current building code requirements will reduce exterior noise levels by approximately 25 dB if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB L_{dn} interior standard at all proposed lots. Requiring that it be possible for windows and doors to remain closed for sound insulation means that air conditioning or mechanical ventilation will be required.

CONCLUSIONS AND RECOMMENDATIONS

The proposed 185-lot single-family residential development will comply with all City of Fresno exterior and interior noise level standards, without the need for further mitigation measures, provided that air conditioning or mechanical ventilation is incorporated into final project design.

The conclusions and recommendations of this acoustical analysis are based upon the best information known to WJV Acoustics Inc. (WJVA) at the time the analysis was prepared concerning the proposed lot layout plan, project site elevation, traffic volumes and roadway configurations. Any significant changes in these factors will require a reevaluation of the findings of this report. Additionally, any significant future changes in motor vehicle technology, noise regulations or other factors beyond WJVA's control may result in long-term noise results different from those described by this analysis.

Respectfully submitted,



Walter J. Van Groningen
President

WJV:wjv

FIGURE 1: SITE PLAN

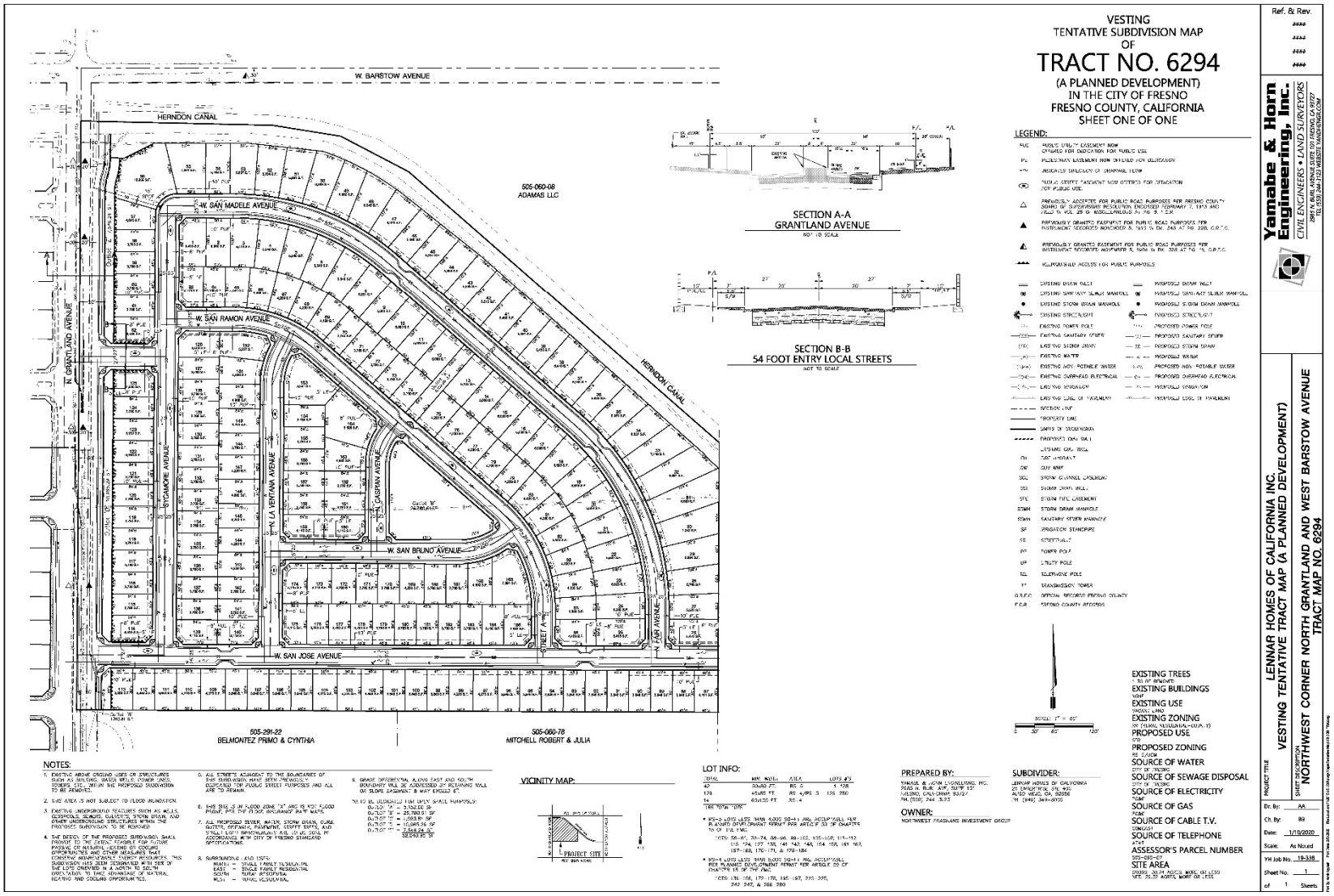


FIGURE 2: PROJECT SITE VICINITY AND NOISE MEASUREMENT LOCATION



FIGURE 3: NORTH GRANTLAND AVENUE NOISE MEASUREMENT SITE



APPENDIX A

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DNL/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). For example, L_{10} equals the level exceeded 10 percent of the time.

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ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of "noise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

SOUND TRANSMISSION CLASS (STC): The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B
EXAMPLES OF SOUND LEVELS

