

West Valley Feeder No. 1 Stage 3 Improvements Project

Proposed Initial Study-Mitigated Negative Declaration



Appendices A through J

Metropolitan Report No. 1582

June 2024

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The Metropolitan Water District of Southern California

700 North Alameda Street
Los Angeles, California 90012

Report No. 1582

June 2024

APPENDICES

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APPENDIX A

METROPOLITAN STANDARD PRACTICES

METROPOLITAN STANDARD PRACTICES

The following are Metropolitan standard practices that are carried out by Metropolitan Environmental Planning or as part of Section 01065 (Environmental Requirements) and Section 01565 (Noise Control) of the construction contractor specifications for all projects (Metropolitan 2021).

General

- The Contractor shall obtain necessary local, state and federal environmental permits and shall comply with the requirements of all such permits and laws, regulations, acts, codes and ordinances.
- The Contractor shall perform all construction activities only within the construction boundaries shown on the drawings. The construction boundaries shall be fenced, unless otherwise directed by the Engineer. Any request to use any area outside the construction boundaries for any activity will require review and approval by the Engineer.
- **Worker Environmental Awareness Protections Training.** Metropolitan routinely conducts pre-construction Worker Environmental Awareness Protections Training (WEAP) for both capital projects and operations and maintenance activities. WEAP trainings are project-specific and cover potential environmental concerns or considerations including, but not limited to, awareness of biological resources, special status species near project sites, jurisdictional waters, cultural resources, paleontological resources, environmentally sensitive areas, and/or avoidance areas.
- **Environmental Assessment.** As an internal practice, Metropolitan conducts Environmental Assessments or similar studies prior to project commencement to determine if any sensitive resources have the potential to be present at a project site. Resources assessed typically include biological, cultural paleontological resources, noise sensitivity, and sensitive receptors in the vicinity of the project area.

Air Quality

- The Contractor shall not discharge smoke, dust, or other air contaminants into the atmosphere in a quantity that exceeds the legal limit.
- The Contractor shall use low sulfur fuels (0.5 percent by weight) for all construction vehicles and equipment.
- The Contractor shall shut-off all idling vehicles when not in use.

- Construction equipment shall be maintained, and properly tuned and operated in a manner so as to reduce peak emission levels.
- Construction methods shall include dust reduction activities, including the use of water trucks in construction areas. The Contractor shall spray water on all unpaved roads as often as required to minimize dust and particulates, and as determined by Engineer. Paved streets shall be swept if silt is carried over to these roads from construction activities.
- The Contractor shall use low emission mobile construction equipment during site preparation, grading, excavation, and construction of the project.
- The Contractor shall use existing on-site power sources (e.g., power poles) rather than portable generators when feasible and as directed by the Engineer; or clean fuel generators shall be used rather than temporary power generators when feasible.
- All off-road diesel-fueled construction equipment greater than 25 horsepower (hp) shall be compliant with federally mandated clean diesel engines (USEPA Tier 4), where available, in accordance with the California Air Resources Board's (CARB) In-use Off-road Diesel-fueled Fleet Regulation (Title 13 California Code of Regulations, Division 3, Chapter 9, Article 4.8). The Contractor shall provide a current copy of each unit's certified tier specifications, best available control technology documentation, and CARB Registrations or SCAQMD operating permit, or the CARB Certificate of Reported Compliance Validation, at the time of mobilization of each unit of equipment.
- The Contractor shall cover all trucks transporting earthen material or maintain at least two feet of freeboard.
- The Contractor shall implement the Best Available Control Measures listed in Table 1 of the SCAQMD Rule 403 (Fugitive Dust).
- When wind speeds, including instantaneous gusts, exceed 25 miles per hour, the Contractor shall implement and record Contingency Control Measures listed in Table 3 in SCAQMD Rule 403.

Biological Resources

- **Trees.** As part of the project, the following procedures will be implemented to avoid adverse impacts to trees located within the project work limits:
 - Impacts to any trees located within the project work limits shall be avoided, when possible.
 - No trees within project work limits shall be removed, cut, or trimmed unless identified for removal on project drawings.

- If trees must be removed, cut or trimmed, this activity shall be conducted per any applicable local tree ordinances and any required permits must be obtained prior to any tree removal, cutting or trimming.
 - The Contractor shall avoid stockpiling of materials, and driving or parking vehicles and equipment under the canopy of existing trees to protect tree root systems and avoid damage to the trees.
- **Nesting Bird Surveys.** No physical disturbance of vegetation, operational structures, buildings, or other potential habitat (e.g., open ground, gravel, construction equipment or vehicles, etc.) that may support nesting birds protected by the federal Migratory Bird Treaty Act and California Fish and Game Code shall occur in the breeding season, except as necessary to respond to public health and safety concerns, or otherwise authorized by the Engineer. The breeding season extends from **February 15 through August 31 (edit as required)** for passerines and general nesting and from January 1 through August 31 for raptors.
 - If nesting habitat must be cleared or project activities must occur in the vicinity of nesting habitat within the breeding season as defined above, a qualified biologist shall perform a nesting bird survey no more than three days prior to clearing or removal of nesting habitat or start of project activities.
 - If active nests for sensitive species, raptors and/or migratory birds are observed, an adequate buffer zone or other avoidance and minimization measures, as appropriate, shall be established, as identified by a qualified biologist and approved by the Engineer. The buffer shall be clearly marked in the field by the Contractor, as directed by the Engineer, and construction or clearing shall not be conducted within this zone until the young have fledged and are no longer reliant on the nest.
 - A qualified biologist shall monitor active nests or nesting bird habitat within or immediately adjacent to project construction areas, and the Engineer shall provide necessary recommendations to the Contractor to minimize or avoid impacts to protected nesting birds.
- **Desert Tortoise Awareness Training.** Metropolitan conducts Desert Tortoise Awareness Training for all Metropolitan staff and contractors working at Metropolitan's desert facilities or on the CRA. Desert Tortoise Awareness Training consists of a presentation and handout discussing the protected status of the desert tortoise and its habitat, predators, and avoidance measures. Avoidance measures include, but are not limited to the following:
 - Work areas shall be delineated with flagging if determined necessary by the qualified staff person.
 - Access to project sites shall be restricted to designated existing routes of travel.

- Workers shall inspect for tortoises under vehicles and equipment prior to use. If a tortoise is present, workers would only move the vehicle when the tortoise would not be injured by the vehicle or would wait for the tortoise to move out from under the vehicle.

Cultural Resources, Paleontological Resources, and Human Remains

- If archaeological or paleontological resources are encountered at the project site, the Contractor shall not disturb the resources and shall immediately cease all work within 50 feet of the discovery, notify the Engineer, and protect the discovery area, as directed by the Engineer. The Engineer, with the qualified architectural historian, archaeologist and/or paleontologist, shall make a decision of validity of the discovery and designate an area surrounding the discovery as a restricted area. The Contractor shall not enter or work in the restricted area until the Engineer provides written authorization.
- In the event that human remains are discovered during excavation/construction activity, Health and Safety Code Section 7050.5, CEQA Guidelines Section 15064.5(e), and Public Resources Code (PRC) Section 5097.98 will apply. The Contractor shall notify the Engineer at once and not enter or work in the restricted area until the Engineer provides written authorization.

Hazardous Materials

- The Contractor shall clean up all spills in accordance with all applicable environmental laws and regulations and notify the Engineer immediately in the event of a spill.
- Stationary equipment such as motors, pumps, and generators, shall be equipped with drip pans.
- The Contractor shall handle, store, apply, and dispose of chemicals and/or herbicides consistent with all applicable federal, state and local regulations.
- The Contractor shall dispose of all contaminated materials in a manner consistent with all applicable local, state and federal environmental laws and regulations.
- Hazardous materials shall be stored in covered, leak-proof containers when not in use, away from storm drains and heavy traffic areas, and shall be protected from rainfall infiltration. Hazardous materials shall be stored separately from non-hazardous materials on a surface that prevents spills from permeating the ground surface, and in an area secure from unauthorized entry at all times. Incompatible materials shall be stored separately from each other.

Hydrology and Water Quality

- The Contractor shall not allow any equipment or vehicle storage within any drainage course or channels.
- Any material placed in areas where it could be washed into a drainage course or channel shall be removed prior to the rainy season.
- The Contractor shall not create a nuisance or pollution as defined in the California Water Code. The Contractor shall not cause a violation of any applicable water quality standards for receiving waters adopted by the Regional Water Quality Control Board or the SWRCB, as required by the Clean Water Act (CWA).
- Dewatering activities shall not affect any vegetation outside of the construction limits. The Contractor shall submit proposed dewatering plans to the Engineer for approval prior to any dewatering activities.

Lighting

- The Contractor shall exercise special care to direct floodlights to shine downward. These floodlights shall also be shielded to avoid a nuisance to the surrounding areas. No lighting shall include a residence or native area in its direct beam. The Contractor shall correct lighting nuisance whenever it occurs.

Noise

- The Contractor shall locate all noise-generating and stationary construction equipment as far as feasible from near-site residential and sensitive receivers and situated so that emitted noise is directed away from the sensitive receivers.
- To the extent feasible, noise-generating equipment shall be oriented such that the source of noise is facing away from the nearest sensitive receivers.
- Equipment idling time shall be reduced to five minutes on cranes and construction equipment.
- Areas where workers gather (e.g., break areas, shift-change areas, meeting areas, and sanitary stations) will be located a minimum of 100 feet away from any residence, if feasible.
- Parking areas shall be located a minimum of 150 feet from sensitive receivers. Parking areas within 500 feet of sensitive receivers will be posted with signs to prohibit workers from gathering during nighttime hours and to prohibit radios and music at any time.

- Fuel deliveries shall be a minimum of 500 feet from residences or to the greatest extent feasible.
- The Contractor shall perform all work without undue noise and shall make every effort to alleviate or prevent noise nuisances.
- The Contractor's construction vehicles and equipment shall have mufflers. The Contractor shall equip all construction equipment, fixed and mobile, with properly operating and maintained noise mufflers and intake silencers, consistent with the manufacturer standards. Equipment shall be maintained to a minimum standard that includes engine noise baffles and mufflers that meet or exceed the original manufacturer requirements.
- The Contractor shall utilize the following types of equipment whenever possible: electrical instead of diesel-powered equipment, hydraulic tools instead of pneumatic tools, and use of electric welders powered by remote generators.

Traffic

- The Contractor shall prepare a traffic control plan. This plan shall address temporary traffic control for each construction site in public roadways. The requirements and procedures described in the California Department of Transportation (Caltrans) "Manual of Traffic Controls for Construction and Maintenance Work Zones" or local requirements and procedures that meet or exceed the Caltrans' Manual shall be used in the plan. If required, the Contractor shall submit the plan for review and approval by local and State traffic authorities, as appropriate.
- As appropriate, the Contractor shall provide flagmen at intersections to assist trucks entering/exiting the work limits.
- The Contractor shall provide appropriate advance warning signage to alert motorists or pedestrians to the potential for cross construction vehicle traffic from work limits in accordance with Caltrans standards.

Wildfire

- Gasoline-powered or diesel-powered machinery used during construction shall be equipped with standard exhaust controls and muffling devices that shall also act as spark arrestors.
- Fire containment and extinguishing equipment shall be located on site and shall be accessible during construction activities. Construction workers shall be trained in use of the fire suppression equipment.

APPENDIX B
CALEEMOD CALCULATIONS

MWD West Valley Feeder - Los Angeles-South Coast County, Winter

MWD West Valley Feeder
Los Angeles-South Coast County, Winter

1.0 Project Characteristics**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	7.00	1000sqft	0.16	7,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	33
Climate Zone	8			Operational Year	2020
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MW hr)	1227.89	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Asphalt Access Roads,

Construction Phase - .

Off-road Equipment - 1 excavator, 1 tractor, 1 crane

Off-road Equipment - 1 loader

Off-road Equipment - 1 tractor, 1 excavator, 1 grader, 1 crane

Off-road Equipment - 1 paver

Off-road Equipment - 1 excavator

Trips and VMT - .

Demolition - Tons based on truckload (1 truckload), 20 ton truck

Grading - Cubic yards based on truckloads, assuming 16 cy truck

Construction Off-road Equipment Mitigation - Rule 403

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	22.00
tblConstructionPhase	NumDays	1.00	21.00
tblConstructionPhase	NumDays	2.00	44.00
tblConstructionPhase	NumDays	100.00	109.00
tblConstructionPhase	NumDays	5.00	22.00
tblGrading	MaterialExported	0.00	32.00
tblGrading	MaterialExported	0.00	144.00
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.8878	20.0834	11.1128	0.0211	0.6437	0.9956	1.3569	0.0874	0.9159	0.9267	0.0000	2,092.5587	2,092.5587	0.6280	0.0000	2,108.2580
2020	2.0387	21.2124	13.5571	0.0251	0.0863	1.0312	1.1175	0.0233	0.9488	0.9721	0.0000	2,443.5460	2,443.5460	0.7502	0.0000	2,462.3000
Maximum	2.0387	21.2124	13.5571	0.0251	0.6437	1.0312	1.3569	0.0874	0.9488	0.9721	0.0000	2,443.5460	2,443.5460	0.7502	0.0000	2,462.3000

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.8878	20.0834	11.1128	0.0211	0.3520	0.9956	1.0652	0.0559	0.9159	0.9267	0.0000	2,092.5587	2,092.5587	0.6280	0.0000	2,108.2580
2020	2.0387	21.2124	13.5571	0.0251	0.0863	1.0312	1.1175	0.0233	0.9488	0.9721	0.0000	2,443.5460	2,443.5460	0.7502	0.0000	2,462.3000
Maximum	2.0387	21.2124	13.5571	0.0251	0.3520	1.0312	1.1175	0.0559	0.9488	0.9721	0.0000	2,443.5460	2,443.5460	0.7502	0.0000	2,462.3000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	39.96	0.00	11.79	28.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000	0.0000	1.6300e-003

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000	0.0000	1.6300e-003

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	8/30/2019	5	22	
2	Site Preparation	Site Preparation	9/1/2019	9/30/2019	5	21	
3	Grading	Grading	10/1/2019	11/30/2019	5	44	
4	Building Construction	Building Construction	12/1/2019	4/30/2020	5	109	
5	Paving	Paving	4/1/2020	4/30/2020	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 22

Acres of Paving: 0.16

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Site Preparation	Excavators	1	8.00	158	0.38
Site Preparation	Graders	0	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Concrete/Industrial Saws	0	8.00	81	0.73
Grading	Cranes	1	8.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	0	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	0	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	0	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Rubber Tired Dozers	1	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	1	3.00	0.00	2.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	1	3.00	0.00	18.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	3.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	1	3.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0195	0.0000	0.0195	2.9500e-003	0.0000	2.9500e-003			0.0000			0.0000
Off-Road	0.1746	1.7530	1.7270	2.3300e-003		0.1170	0.1170		0.1077	0.1077		230.6564	230.6564	0.0730		232.4808
Total	0.1746	1.7530	1.7270	2.3300e-003	0.0195	0.1170	0.1365	2.9500e-003	0.1077	0.1106		230.6564	230.6564	0.0730		232.4808

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.8000e-004	0.0282	6.3400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.4000e-004		7.7259	7.7259	5.6000e-004		7.7400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0166	0.0122	0.1327	3.4000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		34.2639	34.2639	1.1800e-003		34.2934
Total	0.0175	0.0404	0.1391	4.1000e-004	0.0351	3.9000e-004	0.0355	9.3300e-003	3.7000e-004	9.7000e-003		41.9898	41.9898	1.7400e-003		42.0333

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.7500e-003	0.0000	8.7500e-003	1.3300e-003	0.0000	1.3300e-003			0.0000			0.0000
Off-Road	0.1746	1.7530	1.7270	2.3300e-003		0.1170	0.1170		0.1077	0.1077	0.0000	230.6564	230.6564	0.0730		232.4808
Total	0.1746	1.7530	1.7270	2.3300e-003	8.7500e-003	0.1170	0.1258	1.3300e-003	0.1077	0.1090	0.0000	230.6564	230.6564	0.0730		232.4808

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	8.8000e-004	0.0282	6.3400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.4000e-004		7.7259	7.7259	5.6000e-004		7.7400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0166	0.0122	0.1327	3.4000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		34.2639	34.2639	1.1800e-003		34.2934
Total	0.0175	0.0404	0.1391	4.1000e-004	0.0351	3.9000e-004	0.0355	9.3300e-003	3.7000e-004	9.7000e-003		41.9898	41.9898	1.7400e-003		42.0333

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.8000e-004	0.0000	7.8000e-004	1.2000e-004	0.0000	1.2000e-004			0.0000			0.0000
Off-Road	0.2607	2.6819	3.2632	5.1600e-003		0.1293	0.1293		0.1190	0.1190		511.1256	511.1256	0.1617		515.1684
Total	0.2607	2.6819	3.2632	5.1600e-003	7.8000e-004	0.1293	0.1301	1.2000e-004	0.1190	0.1191		511.1256	511.1256	0.1617		515.1684

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.2600e-003	0.2660	0.0598	6.7000e-004	0.0150	9.8000e-004	0.0160	4.1100e-003	9.4000e-004	5.0500e-003		72.8443	72.8443	5.3000e-003		72.9767
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0166	0.0122	0.1327	3.4000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		34.2639	34.2639	1.1800e-003		34.2934

Total	0.0249	0.2782	0.1925	1.0100e-003	0.0485	1.2700e-003	0.0498	0.0130	1.2100e-003	0.0142		107.1082	107.1082	6.4800e-003		107.2701
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5000e-004	0.0000	3.5000e-004	5.0000e-005	0.0000	5.0000e-005			0.0000			0.0000
Off-Road	0.2607	2.6819	3.2632	5.1600e-003		0.1293	0.1293		0.1190	0.1190	0.0000	511.1256	511.1256	0.1617		515.1684
Total	0.2607	2.6819	3.2632	5.1600e-003	3.5000e-004	0.1293	0.1297	5.0000e-005	0.1190	0.1190	0.0000	511.1256	511.1256	0.1617		515.1684

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.2600e-003	0.2660	0.0598	6.7000e-004	0.0150	9.8000e-004	0.0160	4.1100e-003	9.4000e-004	5.0500e-003		72.8443	72.8443	5.3000e-003		72.9767
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0166	0.0122	0.1327	3.4000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		34.2639	34.2639	1.1800e-003		34.2934
Total	0.0249	0.2782	0.1925	1.0100e-003	0.0485	1.2700e-003	0.0498	0.0130	1.2100e-003	0.0142		107.1082	107.1082	6.4800e-003		107.2701

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	1.4261	17.0215	9.1213	0.0199		0.7122	0.7122		0.6552	0.6552		1,970.6197	1,970.6197	0.6235		1,986.2068
Total	1.4261	17.0215	9.1213	0.0199	0.5303	0.7122	1.2425	0.0573	0.6552	0.7125		1,970.6197	1,970.6197	0.6235		1,986.2068

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.8000e-004	0.0282	6.3400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.4000e-004		7.7259	7.7259	5.6000e-004		7.7400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0554	0.0407	0.4425	1.1500e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		114.2131	114.2131	3.9300e-003		114.3113
Total	0.0563	0.0689	0.4488	1.2200e-003	0.1134	1.0600e-003	0.1144	0.0301	9.9000e-004	0.0311		121.9390	121.9390	4.4900e-003		122.0513

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					0.2387	0.0000	0.2387	0.0258	0.0000	0.0258			0.0000			0.0000
Off-Road	1.4261	17.0215	9.1213	0.0199		0.7122	0.7122		0.6552	0.6552	0.0000	1,970.6197	1,970.6197	0.6235		1,986.2068
Total	1.4261	17.0215	9.1213	0.0199	0.2387	0.7122	0.9508	0.0258	0.6552	0.6810	0.0000	1,970.6197	1,970.6197	0.6235		1,986.2068

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.8000e-004	0.0282	6.3400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.4000e-004		7.7259	7.7259	5.6000e-004		7.7400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0554	0.0407	0.4425	1.1500e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		114.2131	114.2131	3.9300e-003		114.3113
Total	0.0563	0.0689	0.4488	1.2200e-003	0.1134	1.0600e-003	0.1144	0.0301	9.9000e-004	0.0311		121.9390	121.9390	4.4900e-003		122.0513

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150		1,939.7674	1,939.7674	0.6137		1,955.1105
Total	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150		1,939.7674	1,939.7674	0.6137		1,955.1105

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.3300e-003	0.1159	0.0339	2.5000e-004	6.4000e-003	7.5000e-004	7.1500e-003	1.8400e-003	7.2000e-004	2.5600e-003		27.1277	27.1277	1.9100e-003		27.1754
Worker	0.0166	0.0122	0.1327	3.4000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		34.2639	34.2639	1.1800e-003		34.2934
Total	0.0209	0.1281	0.1666	5.9000e-004	0.0399	1.0400e-003	0.0410	0.0107	9.9000e-004	0.0117		61.3916	61.3916	3.0900e-003		61.4687

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150	0.0000	1,939.7674	1,939.7674	0.6137		1,955.1105
Total	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150	0.0000	1,939.7674	1,939.7674	0.6137		1,955.1105

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.3300e-003	0.1159	0.0339	2.5000e-004	6.4000e-003	7.5000e-004	7.1500e-003	1.8400e-003	7.2000e-004	2.5600e-003		27.1277	27.1277	1.9100e-003		27.1754
Worker	0.0166	0.0122	0.1327	3.4000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		34.2639	34.2639	1.1800e-003		34.2934
Total	0.0209	0.1281	0.1666	5.9000e-004	0.0399	1.0400e-003	0.0410	0.0107	9.9000e-004	0.0117		61.3916	61.3916	3.0900e-003		61.4687

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368		1,897.9030	1,897.9030	0.6138		1,913.2485
Total	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368		1,897.9030	1,897.9030	0.6138		1,913.2485

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.7200e-003	0.1064	0.0307	2.5000e-004	6.4000e-003	5.1000e-004	6.9100e-003	1.8400e-003	4.9000e-004	2.3300e-003		26.9449	26.9449	1.8000e-003		26.9900
Worker	0.0153	0.0109	0.1203	3.3000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		33.2226	33.2226	1.0500e-003		33.2488

Total	0.0191	0.1172	0.1510	5.8000e-004	0.0399	7.9000e-004	0.0407	0.0107	7.5000e-004	0.0115		60.1675	60.1675	2.8500e-003		60.2387
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368	0.0000	1,897.9030	1,897.9030	0.6138		1,913.2485
Total	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368	0.0000	1,897.9030	1,897.9030	0.6138		1,913.2485

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.7200e-003	0.1064	0.0307	2.5000e-004	6.4000e-003	5.1000e-004	6.9100e-003	1.8400e-003	4.9000e-004	2.3300e-003		26.9449	26.9449	1.8000e-003		26.9900
Worker	0.0153	0.0109	0.1203	3.3000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		33.2226	33.2226	1.0500e-003		33.2488
Total	0.0191	0.1172	0.1510	5.8000e-004	0.0399	7.9000e-004	0.0407	0.0107	7.5000e-004	0.0115		60.1675	60.1675	2.8500e-003		60.2387

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2298	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100		398.3631	398.3631	0.1288		401.5841
Paving	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.2489	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100		398.3631	398.3631	0.1288		401.5841

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4400e-003	0.2127	0.0615	5.0000e-004	0.0128	1.0200e-003	0.0138	3.6900e-003	9.7000e-004	4.6600e-003		53.8898	53.8898	3.6000e-003		53.9799
Worker	0.0153	0.0109	0.1203	3.3000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		33.2226	33.2226	1.0500e-003		33.2488
Total	0.0228	0.2236	0.1818	8.3000e-004	0.0463	1.3000e-003	0.0476	0.0126	1.2300e-003	0.0138		87.1124	87.1124	4.6500e-003		87.2287

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0.2298	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100	0.0000	398.3631	398.3631	0.1288		401.5841
Paving	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.2489	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100	0.0000	398.3631	398.3631	0.1288		401.5841

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4400e-003	0.2127	0.0615	5.0000e-004	0.0128	1.0200e-003	0.0138	3.6900e-003	9.7000e-004	4.6600e-003		53.8898	53.8898	3.6000e-003		53.9799
Worker	0.0153	0.0109	0.1203	3.3000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		33.2226	33.2226	1.0500e-003		33.2488
Total	0.0228	0.2236	0.1818	8.3000e-004	0.0463	1.3000e-003	0.0476	0.0126	1.2300e-003	0.0138		87.1124	87.1124	4.6500e-003		87.2287

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Unmitigated	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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SubCategory	lb/day										lb/day					
Architectural Coating	5.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

MWD West Valley Feeder - Los Angeles-South Coast County, Summer

MWD West Valley Feeder

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	7.00	1000sqft	0.16	7,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	33
Climate Zone	8			Operational Year	2020
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MW hr)	1227.89	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Asphalt Access Roads,

Construction Phase - .

Off-road Equipment - 1 excavator, 1 tractor, 1 crane

Off-road Equipment - 1 loader

Off-road Equipment - 1 tractor, 1 excavator, 1 grader, 1 crane

Off-road Equipment - 1 paver

Off-road Equipment - 1 excavator

Trips and VMT - .

Demolition - Tons based on truckload (1 truckload), 20 ton truck

Grading - Cubic yards based on truckloads, assuming 16 cy truck

Construction Off-road Equipment Mitigation - Rule 403

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	22.00
tblConstructionPhase	NumDays	1.00	21.00
tblConstructionPhase	NumDays	2.00	44.00
tblConstructionPhase	NumDays	100.00	109.00
tblConstructionPhase	NumDays	5.00	22.00
tblGrading	MaterialExported	0.00	32.00
tblGrading	MaterialExported	0.00	144.00
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.8860	20.0820	11.1215	0.0212	0.6437	0.9955	1.3569	0.0874	0.9159	0.9267	0.0000	2,099.7742	2,099.7742	0.6282	0.0000	2,115.4790
2020	2.0352	21.2104	13.5706	0.0252	0.0863	1.0312	1.1175	0.0233	0.9487	0.9720	0.0000	2,449.9403	2,449.9403	0.7500	0.0000	2,468.6891
Maximum	2.0352	21.2104	13.5706	0.0252	0.6437	1.0312	1.3569	0.0874	0.9487	0.9720	0.0000	2,449.9403	2,449.9403	0.7500	0.0000	2,468.6891

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.8860	20.0820	11.1215	0.0212	0.3520	0.9955	1.0652	0.0559	0.9159	0.9267	0.0000	2,099.7742	2,099.7742	0.6282	0.0000	2,115.4790
2020	2.0352	21.2104	13.5706	0.0252	0.0863	1.0312	1.1175	0.0233	0.9487	0.9720	0.0000	2,449.9403	2,449.9403	0.7500	0.0000	2,468.6891
Maximum	2.0352	21.2104	13.5706	0.0252	0.3520	1.0312	1.1175	0.0559	0.9487	0.9720	0.0000	2,449.9403	2,449.9403	0.7500	0.0000	2,468.6891

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	39.96	0.00	11.79	28.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000	0.0000	1.6300e-003

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000	0.0000	1.6300e-003

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	8/30/2019	5	22	
2	Site Preparation	Site Preparation	9/1/2019	9/30/2019	5	21	
3	Grading	Grading	10/1/2019	11/30/2019	5	44	
4	Building Construction	Building Construction	12/1/2019	4/30/2020	5	109	
5	Paving	Paving	4/1/2020	4/30/2020	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 22

Acres of Paving: 0.16

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Site Preparation	Excavators	1	8.00	158	0.38
Site Preparation	Graders	0	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Concrete/Industrial Saws	0	8.00	81	0.73
Grading	Cranes	1	8.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	0	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	0	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	0	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Rubber Tired Dozers	1	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	1	3.00	0.00	2.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	1	3.00	0.00	18.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	3.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	1	3.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0195	0.0000	0.0195	2.9500e-003	0.0000	2.9500e-003			0.0000			0.0000
Off-Road	0.1746	1.7530	1.7270	2.3300e-003		0.1170	0.1170		0.1077	0.1077		230.6564	230.6564	0.0730		232.4808
Total	0.1746	1.7530	1.7270	2.3300e-003	0.0195	0.1170	0.1365	2.9500e-003	0.1077	0.1106		230.6564	230.6564	0.0730		232.4808

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.5000e-004	0.0278	5.9400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.3000e-004		7.8592	7.8592	5.4000e-004		7.8727
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0150	0.0110	0.1447	3.7000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		36.3886	36.3886	1.2500e-003		36.4198
Total	0.0158	0.0389	0.1506	4.4000e-004	0.0351	3.9000e-004	0.0355	9.3300e-003	3.7000e-004	9.6900e-003		44.2478	44.2478	1.7900e-003		44.2926

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.7500e-003	0.0000	8.7500e-003	1.3300e-003	0.0000	1.3300e-003			0.0000			0.0000
Off-Road	0.1746	1.7530	1.7270	2.3300e-003		0.1170	0.1170		0.1077	0.1077	0.0000	230.6564	230.6564	0.0730		232.4808
Total	0.1746	1.7530	1.7270	2.3300e-003	8.7500e-003	0.1170	0.1258	1.3300e-003	0.1077	0.1090	0.0000	230.6564	230.6564	0.0730		232.4808

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	8.5000e-004	0.0278	5.9400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.3000e-004		7.8592	7.8592	5.4000e-004		7.8727
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0150	0.0110	0.1447	3.7000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		36.3886	36.3886	1.2500e-003		36.4198
Total	0.0158	0.0389	0.1506	4.4000e-004	0.0351	3.9000e-004	0.0355	9.3300e-003	3.7000e-004	9.6900e-003		44.2478	44.2478	1.7900e-003		44.2926

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.8000e-004	0.0000	7.8000e-004	1.2000e-004	0.0000	1.2000e-004			0.0000			0.0000
Off-Road	0.2607	2.6819	3.2632	5.1600e-003		0.1293	0.1293		0.1190	0.1190		511.1256	511.1256	0.1617		515.1684
Total	0.2607	2.6819	3.2632	5.1600e-003	7.8000e-004	0.1293	0.1301	1.2000e-004	0.1190	0.1191		511.1256	511.1256	0.1617		515.1684

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.0500e-003	0.2625	0.0560	6.8000e-004	0.0150	9.6000e-004	0.0160	4.1100e-003	9.2000e-004	5.0300e-003		74.1010	74.1010	5.1000e-003		74.2286
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0150	0.0110	0.1447	3.7000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		36.3886	36.3886	1.2500e-003		36.4198

Total	0.0230	0.2735	0.2006	1.0500e-003	0.0485	1.2500e-003	0.0498	0.0130	1.1900e-003	0.0142		110.4896	110.4896	6.3500e-003		110.6484
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5000e-004	0.0000	3.5000e-004	5.0000e-005	0.0000	5.0000e-005			0.0000			0.0000
Off-Road	0.2607	2.6819	3.2632	5.1600e-003		0.1293	0.1293		0.1190	0.1190	0.0000	511.1256	511.1256	0.1617		515.1684
Total	0.2607	2.6819	3.2632	5.1600e-003	3.5000e-004	0.1293	0.1297	5.0000e-005	0.1190	0.1190	0.0000	511.1256	511.1256	0.1617		515.1684

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.0500e-003	0.2625	0.0560	6.8000e-004	0.0150	9.6000e-004	0.0160	4.1100e-003	9.2000e-004	5.0300e-003		74.1010	74.1010	5.1000e-003		74.2286
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0150	0.0110	0.1447	3.7000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		36.3886	36.3886	1.2500e-003		36.4198
Total	0.0230	0.2735	0.2006	1.0500e-003	0.0485	1.2500e-003	0.0498	0.0130	1.1900e-003	0.0142		110.4896	110.4896	6.3500e-003		110.6484

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	1.4261	17.0215	9.1213	0.0199		0.7122	0.7122		0.6552	0.6552		1,970.6197	1,970.6197	0.6235		1,986.2068
Total	1.4261	17.0215	9.1213	0.0199	0.5303	0.7122	1.2425	0.0573	0.6552	0.7125		1,970.6197	1,970.6197	0.6235		1,986.2068

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.5000e-004	0.0278	5.9400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.3000e-004		7.8592	7.8592	5.4000e-004		7.8727
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0500	0.0367	0.4822	1.2200e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		121.2953	121.2953	4.1700e-003		121.3995
Total	0.0508	0.0646	0.4881	1.2900e-003	0.1134	1.0600e-003	0.1144	0.0301	9.9000e-004	0.0311		129.1545	129.1545	4.7100e-003		129.2722

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					0.2387	0.0000	0.2387	0.0258	0.0000	0.0258			0.0000			0.0000
Off-Road	1.4261	17.0215	9.1213	0.0199		0.7122	0.7122		0.6552	0.6552	0.0000	1,970.6197	1,970.6197	0.6235		1,986.2068
Total	1.4261	17.0215	9.1213	0.0199	0.2387	0.7122	0.9508	0.0258	0.6552	0.6810	0.0000	1,970.6197	1,970.6197	0.6235		1,986.2068

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	8.5000e-004	0.0278	5.9400e-003	7.0000e-005	1.5900e-003	1.0000e-004	1.6900e-003	4.4000e-004	1.0000e-004	5.3000e-004		7.8592	7.8592	5.4000e-004		7.8727
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0500	0.0367	0.4822	1.2200e-003	0.1118	9.6000e-004	0.1127	0.0296	8.9000e-004	0.0305		121.2953	121.2953	4.1700e-003		121.3995
Total	0.0508	0.0646	0.4881	1.2900e-003	0.1134	1.0600e-003	0.1144	0.0301	9.9000e-004	0.0311		129.1545	129.1545	4.7100e-003		129.2722

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150		1,939.7674	1,939.7674	0.6137		1,955.1105
Total	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150		1,939.7674	1,939.7674	0.6137		1,955.1105

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.1600e-003	0.1157	0.0307	2.6000e-004	6.4000e-003	7.4000e-004	7.1400e-003	1.8400e-003	7.1000e-004	2.5500e-003		27.8815	27.8815	1.7900e-003		27.9261
Worker	0.0150	0.0110	0.1447	3.7000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		36.3886	36.3886	1.2500e-003		36.4198
Total	0.0192	0.1267	0.1754	6.3000e-004	0.0399	1.0300e-003	0.0410	0.0107	9.8000e-004	0.0117		64.2701	64.2701	3.0400e-003		64.3460

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150	0.0000	1,939.7674	1,939.7674	0.6137		1,955.1105
Total	1.8668	19.9553	10.9462	0.0196		0.9945	0.9945		0.9150	0.9150	0.0000	1,939.7674	1,939.7674	0.6137		1,955.1105

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.1600e-003	0.1157	0.0307	2.6000e-004	6.4000e-003	7.4000e-004	7.1400e-003	1.8400e-003	7.1000e-004	2.5500e-003		27.8815	27.8815	1.7900e-003		27.9261
Worker	0.0150	0.0110	0.1447	3.7000e-004	0.0335	2.9000e-004	0.0338	8.8900e-003	2.7000e-004	9.1600e-003		36.3886	36.3886	1.2500e-003		36.4198
Total	0.0192	0.1267	0.1754	6.3000e-004	0.0399	1.0300e-003	0.0410	0.0107	9.8000e-004	0.0117		64.2701	64.2701	3.0400e-003		64.3460

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368		1,897.9030	1,897.9030	0.6138		1,913.2485
Total	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368		1,897.9030	1,897.9030	0.6138		1,913.2485

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.5600e-003	0.1064	0.0279	2.6000e-004	6.4000e-003	5.0000e-004	6.9000e-003	1.8400e-003	4.8000e-004	2.3200e-003		27.7025	27.7025	1.6900e-003		27.7447
Worker	0.0138	9.8200e-003	0.1314	3.5000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		35.2834	35.2834	1.1100e-003		35.3112

Total	0.0174	0.1162	0.1592	6.1000e-004	0.0399	7.8000e-004	0.0407	0.0107	7.4000e-004	0.0115		62.9859	62.9859	2.8000e-003		63.0559
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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368	0.0000	1,897.9030	1,897.9030	0.6138		1,913.2485
Total	1.7480	18.4126	10.6883	0.0196		0.9096	0.9096		0.8368	0.8368	0.0000	1,897.9030	1,897.9030	0.6138		1,913.2485

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.5600e-003	0.1064	0.0279	2.6000e-004	6.4000e-003	5.0000e-004	6.9000e-003	1.8400e-003	4.8000e-004	2.3200e-003		27.7025	27.7025	1.6900e-003		27.7447
Worker	0.0138	9.8200e-003	0.1314	3.5000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		35.2834	35.2834	1.1100e-003		35.3112
Total	0.0174	0.1162	0.1592	6.1000e-004	0.0399	7.8000e-004	0.0407	0.0107	7.4000e-004	0.0115		62.9859	62.9859	2.8000e-003		63.0559

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2298	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100		398.3631	398.3631	0.1288		401.5841
Paving	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.2489	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100		398.3631	398.3631	0.1288		401.5841

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.1100e-003	0.2127	0.0557	5.2000e-004	0.0128	1.0000e-003	0.0138	3.6900e-003	9.6000e-004	4.6400e-003		55.4049	55.4049	3.3800e-003		55.4895
Worker	0.0138	9.8200e-003	0.1314	3.5000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		35.2834	35.2834	1.1100e-003		35.3112
Total	0.0209	0.2226	0.1871	8.7000e-004	0.0463	1.2800e-003	0.0476	0.0126	1.2200e-003	0.0138		90.6883	90.6883	4.4900e-003		90.8007

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0.2298	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100	0.0000	398.3631	398.3631	0.1288		401.5841
Paving	0.0191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.2489	2.4590	2.5360	4.1100e-003		0.1195	0.1195		0.1100	0.1100	0.0000	398.3631	398.3631	0.1288		401.5841

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.1100e-003	0.2127	0.0557	5.2000e-004	0.0128	1.0000e-003	0.0138	3.6900e-003	9.6000e-004	4.6400e-003		55.4049	55.4049	3.3800e-003		55.4895
Worker	0.0138	9.8200e-003	0.1314	3.5000e-004	0.0335	2.8000e-004	0.0338	8.8900e-003	2.6000e-004	9.1500e-003		35.2834	35.2834	1.1100e-003		35.3112
Total	0.0209	0.2226	0.1871	8.7000e-004	0.0463	1.2800e-003	0.0476	0.0126	1.2200e-003	0.0138		90.6883	90.6883	4.4900e-003		90.8007

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Unmitigated	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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SubCategory	lb/day										lb/day					
Architectural Coating	5.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.0000e-005	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003
Total	3.0800e-003	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.5300e-003	1.5300e-003	0.0000		1.6300e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

MWD West Valley Feeder - Los Angeles-South Coast County, Annual

MWD West Valley Feeder
Los Angeles-South Coast County, Annual

1.0 Project Characteristics**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	7.00	1000sqft	0.16	7,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	33
Climate Zone	8			Operational Year	2020
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MW hr)	1227.89	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Asphalt Access Roads,

Construction Phase - .

Off-road Equipment - 1 excavator, 1 tractor, 1 crane

Off-road Equipment - 1 loader

Off-road Equipment - 1 tractor, 1 excavator, 1 grader, 1 crane

Off-road Equipment - 1 paver

Off-road Equipment - 1 excavator

Trips and VMT - .

Demolition - Tons based on truckload (1 truckload), 20 ton truck

Grading - Cubic yards based on truckloads, assuming 16 cy truck

Construction Off-road Equipment Mitigation - Rule 403

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	22.00
tblConstructionPhase	NumDays	1.00	21.00
tblConstructionPhase	NumDays	2.00	44.00
tblConstructionPhase	NumDays	100.00	109.00
tblConstructionPhase	NumDays	5.00	22.00
tblGrading	MaterialExported	0.00	32.00
tblGrading	MaterialExported	0.00	144.00
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0583	0.6479	0.3899	7.8000e-004	0.0156	0.0293	0.0450	2.2900e-003	0.0270	0.0293	0.0000	70.4111	70.4111	0.0210	0.0000	70.9370
2020	0.0798	0.8357	0.5015	9.3000e-004	2.2000e-003	0.0409	0.0431	5.9000e-004	0.0377	0.0383	0.0000	82.1684	82.1684	0.0257	0.0000	82.8101
Maximum	0.0798	0.8357	0.5015	9.3000e-004	0.0156	0.0409	0.0450	2.2900e-003	0.0377	0.0383	0.0000	82.1684	82.1684	0.0257	0.0000	82.8101

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0583	0.6479	0.3899	7.8000e-004	9.1000e-003	0.0293	0.0384	1.5800e-003	0.0270	0.0285	0.0000	70.4110	70.4110	0.0210	0.0000	70.9369
2020	0.0798	0.8357	0.5015	9.3000e-004	2.2000e-003	0.0409	0.0431	5.9000e-004	0.0377	0.0383	0.0000	82.1684	82.1684	0.0257	0.0000	82.8100
Maximum	0.0798	0.8357	0.5015	9.3000e-004	9.1000e-003	0.0409	0.0431	1.5800e-003	0.0377	0.0383	0.0000	82.1684	82.1684	0.0257	0.0000	82.8100

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	36.66	0.00	7.43	24.65	0.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-1-2019	10-31-2019	0.2616	0.2616
2	11-1-2019	1-31-2020	0.6670	0.6670

3	2-1-2020	4-30-2020	0.6840	0.6840
		Highest	0.6840	0.6840

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.6000e-004	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7000e-004	1.7000e-004	0.0000	0.0000	1.9000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	5.6000e-004	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.7000e-004	1.7000e-004	0.0000	0.0000	1.9000e-004

Mitigated Operational

[illegible]

Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	5.6000e-004	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.7000e-004	1.7000e-004	0.0000	0.0000	1.9000e-004

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	8/30/2019	5	22	
2	Site Preparation	Site Preparation	9/1/2019	9/30/2019	5	21	
3	Grading	Grading	10/1/2019	11/30/2019	5	44	
4	Building Construction	Building Construction	12/1/2019	4/30/2020	5	109	
5	Paving	Paving	4/1/2020	4/30/2020	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 22

Acres of Paving: 0.16

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Site Preparation	Excavators	1	8.00	158	0.38
Site Preparation	Graders	0	8.00	187	0.41

Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Concrete/Industrial Saws	0	8.00	81	0.73
Grading	Cranes	1	8.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	0	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	0	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	0	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Rubber Tired Dozers	1	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	1	3.00	0.00	2.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	1	3.00	0.00	18.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	3.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	1	3.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1000e-004	0.0000	2.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0193	0.0190	3.0000e-005		1.2900e-003	1.2900e-003		1.1800e-003	1.1800e-003	0.0000	2.3017	2.3017	7.3000e-004	0.0000	2.3199
Total	1.9200e-003	0.0193	0.0190	3.0000e-005	2.1000e-004	1.2900e-003	1.5000e-003	3.0000e-005	1.1800e-003	1.2100e-003	0.0000	2.3017	2.3017	7.3000e-004	0.0000	2.3199

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.2000e-004	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0779	0.0779	1.0000e-005	0.0000	0.0780
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.4000e-004	1.5000e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3476	0.3476	1.0000e-005	0.0000	0.3479
Total	1.8000e-004	4.6000e-004	1.5700e-003	0.0000	3.8000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.1000e-004	0.0000	0.4255	0.4255	2.0000e-005	0.0000	0.4259

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-004	0.0000	1.0000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9200e-003	0.0193	0.0190	3.0000e-005		1.2900e-003	1.2900e-003		1.1800e-003	1.1800e-003	0.0000	2.3017	2.3017	7.3000e-004	0.0000	2.3199
Total	1.9200e-003	0.0193	0.0190	3.0000e-005	1.0000e-004	1.2900e-003	1.3900e-003	1.0000e-005	1.1800e-003	1.1900e-003	0.0000	2.3017	2.3017	7.3000e-004	0.0000	2.3199

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.2000e-004	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0779	0.0779	1.0000e-005	0.0000	0.0780
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.4000e-004	1.5000e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3476	0.3476	1.0000e-005	0.0000	0.3479
Total	1.8000e-004	4.6000e-004	1.5700e-003	0.0000	3.8000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.1000e-004	0.0000	0.4255	0.4255	2.0000e-005	0.0000	0.4259

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7400e-003	0.0282	0.0343	5.0000e-005		1.3600e-003	1.3600e-003		1.2500e-003	1.2500e-003	0.0000	4.8687	4.8687	1.5400e-003	0.0000	4.9072

Total	2.7400e-003	0.0282	0.0343	5.0000e-005	1.0000e-005	1.3600e-003	1.3700e-003	0.0000	1.2500e-003	1.2500e-003	0.0000	4.8687	4.8687	1.5400e-003	0.0000	4.9072
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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	2.8500e-003	6.1000e-004	1.0000e-005	1.5000e-004	1.0000e-005	1.6000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.7008	0.7008	5.0000e-005	0.0000	0.7021
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.3000e-004	1.4300e-003	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3318	0.3318	1.0000e-005	0.0000	0.3321
Total	2.5000e-004	2.9800e-003	2.0400e-003	1.0000e-005	5.0000e-004	1.0000e-005	5.1000e-004	1.3000e-004	1.0000e-005	1.4000e-004	0.0000	1.0326	1.0326	6.0000e-005	0.0000	1.0341

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7400e-003	0.0282	0.0343	5.0000e-005		1.3600e-003	1.3600e-003		1.2500e-003	1.2500e-003	0.0000	4.8687	4.8687	1.5400e-003	0.0000	4.9072
Total	2.7400e-003	0.0282	0.0343	5.0000e-005	0.0000	1.3600e-003	1.3600e-003	0.0000	1.2500e-003	1.2500e-003	0.0000	4.8687	4.8687	1.5400e-003	0.0000	4.9072

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	2.8500e-003	6.1000e-004	1.0000e-005	1.5000e-004	1.0000e-005	1.6000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.7008	0.7008	5.0000e-005	0.0000	0.7021
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6000e-004	1.3000e-004	1.4300e-003	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3318	0.3318	1.0000e-005	0.0000	0.3321
Total	2.5000e-004	2.9800e-003	2.0400e-003	1.0000e-005	5.0000e-004	1.0000e-005	5.1000e-004	1.3000e-004	1.0000e-005	1.4000e-004	0.0000	1.0326	1.0326	6.0000e-005	0.0000	1.0341

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0117	0.0000	0.0117	1.2600e-003	0.0000	1.2600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0314	0.3745	0.2007	4.4000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	39.3298	39.3298	0.0124	0.0000	39.6408
Total	0.0314	0.3745	0.2007	4.4000e-004	0.0117	0.0157	0.0273	1.2600e-003	0.0144	0.0157	0.0000	39.3298	39.3298	0.0124	0.0000	39.6408

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	2.0000e-005	6.3000e-004	1.3000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1557	0.1557	1.0000e-005	0.0000	0.1560
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	9.2000e-004	9.9900e-003	3.0000e-005	2.4100e-003	2.0000e-005	2.4300e-003	6.4000e-004	2.0000e-005	6.6000e-004	0.0000	2.3174	2.3174	8.0000e-005	0.0000	2.3194
Total	1.1200e-003	1.5500e-003	0.0101	3.0000e-005	2.4400e-003	2.0000e-005	2.4700e-003	6.5000e-004	2.0000e-005	6.7000e-004	0.0000	2.4731	2.4731	9.0000e-005	0.0000	2.4754

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.2500e-003	0.0000	5.2500e-003	5.7000e-004	0.0000	5.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0314	0.3745	0.2007	4.4000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	39.3297	39.3297	0.0124	0.0000	39.6408
Total	0.0314	0.3745	0.2007	4.4000e-004	5.2500e-003	0.0157	0.0209	5.7000e-004	0.0144	0.0150	0.0000	39.3297	39.3297	0.0124	0.0000	39.6408

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	6.3000e-004	1.3000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1557	0.1557	1.0000e-005	0.0000	0.1560
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	9.2000e-004	9.9900e-003	3.0000e-005	2.4100e-003	2.0000e-005	2.4300e-003	6.4000e-004	2.0000e-005	6.6000e-004	0.0000	2.3174	2.3174	8.0000e-005	0.0000	2.3194
Total	1.1200e-003	1.5500e-003	0.0101	3.0000e-005	2.4400e-003	2.0000e-005	2.4700e-003	6.5000e-004	2.0000e-005	6.7000e-004	0.0000	2.4731	2.4731	9.0000e-005	0.0000	2.4754

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0205	0.2195	0.1204	2.2000e-004		0.0109	0.0109		0.0101	0.0101	0.0000	19.3570	19.3570	6.1200e-003	0.0000	19.5101
Total	0.0205	0.2195	0.1204	2.2000e-004		0.0109	0.0109		0.0101	0.0101	0.0000	19.3570	19.3570	6.1200e-003	0.0000	19.5101

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.3000e-003	3.6000e-004	0.0000	7.0000e-005	1.0000e-005	8.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.2751	0.2751	2.0000e-005	0.0000	0.2755
Worker	1.7000e-004	1.4000e-004	1.5000e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3476	0.3476	1.0000e-005	0.0000	0.3479
Total	2.2000e-004	1.4400e-003	1.8600e-003	0.0000	4.3000e-004	1.0000e-005	4.4000e-004	1.2000e-004	1.0000e-005	1.3000e-004	0.0000	0.6227	0.6227	3.0000e-005	0.0000	0.6234

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0205	0.2195	0.1204	2.2000e-004		0.0109	0.0109		0.0101	0.0101	0.0000	19.3570	19.3570	6.1200e-003	0.0000	19.5101
Total	0.0205	0.2195	0.1204	2.2000e-004		0.0109	0.0109		0.0101	0.0101	0.0000	19.3570	19.3570	6.1200e-003	0.0000	19.5101

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.3000e-003	3.6000e-004	0.0000	7.0000e-005	1.0000e-005	8.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.2751	0.2751	2.0000e-005	0.0000	0.2755
Worker	1.7000e-004	1.4000e-004	1.5000e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3476	0.3476	1.0000e-005	0.0000	0.3479
Total	2.2000e-004	1.4400e-003	1.8600e-003	0.0000	4.3000e-004	1.0000e-005	4.4000e-004	1.2000e-004	1.0000e-005	1.3000e-004	0.0000	0.6227	0.6227	3.0000e-005	0.0000	0.6234

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0760	0.8010	0.4649	8.5000e-004		0.0396	0.0396		0.0364	0.0364	0.0000	74.8961	74.8961	0.0242	0.0000	75.5016

Total	0.0760	0.8010	0.4649	8.5000e-004		0.0396	0.0396		0.0364	0.0364	0.0000	74.8961	74.8961	0.0242	0.0000	75.5016
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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6000e-004	4.7100e-003	1.2800e-003	1.0000e-005	2.7000e-004	2.0000e-005	3.0000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.0807	1.0807	7.0000e-005	0.0000	1.0824
Worker	6.0000e-004	4.9000e-004	5.3700e-003	1.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3329	1.3329	4.0000e-005	0.0000	1.3339
Total	7.6000e-004	5.2000e-003	6.6500e-003	2.0000e-005	1.7000e-003	3.0000e-005	1.7400e-003	4.6000e-004	3.0000e-005	4.9000e-004	0.0000	2.4135	2.4135	1.1000e-004	0.0000	2.4163

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0760	0.8010	0.4649	8.5000e-004		0.0396	0.0396		0.0364	0.0364	0.0000	74.8960	74.8960	0.0242	0.0000	75.5016
Total	0.0760	0.8010	0.4649	8.5000e-004		0.0396	0.0396		0.0364	0.0364	0.0000	74.8960	74.8960	0.0242	0.0000	75.5016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6000e-004	4.7100e-003	1.2800e-003	1.0000e-005	2.7000e-004	2.0000e-005	3.0000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.0807	1.0807	7.0000e-005	0.0000	1.0824
Worker	6.0000e-004	4.9000e-004	5.3700e-003	1.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3329	1.3329	4.0000e-005	0.0000	1.3339
Total	7.6000e-004	5.2000e-003	6.6500e-003	2.0000e-005	1.7000e-003	3.0000e-005	1.7400e-003	4.6000e-004	3.0000e-005	4.9000e-004	0.0000	2.4135	2.4135	1.1000e-004	0.0000	2.4163

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5300e-003	0.0271	0.0279	5.0000e-005		1.3100e-003	1.3100e-003		1.2100e-003	1.2100e-003	0.0000	3.9753	3.9753	1.2900e-003	0.0000	4.0074
Paving	2.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.7400e-003	0.0271	0.0279	5.0000e-005		1.3100e-003	1.3100e-003		1.2100e-003	1.2100e-003	0.0000	3.9753	3.9753	1.2900e-003	0.0000	4.0074

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.3800e-003	6.5000e-004	1.0000e-005	1.4000e-004	1.0000e-005	1.5000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.5465	0.5465	3.0000e-005	0.0000	0.5474
Worker	1.5000e-004	1.2000e-004	1.3600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3371	0.3371	1.0000e-005	0.0000	0.3373
Total	2.3000e-004	2.5000e-003	2.0100e-003	1.0000e-005	5.0000e-004	1.0000e-005	5.1000e-004	1.4000e-004	1.0000e-005	1.5000e-004	0.0000	0.8836	0.8836	4.0000e-005	0.0000	0.8847

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5300e-003	0.0271	0.0279	5.0000e-005		1.3100e-003	1.3100e-003		1.2100e-003	1.2100e-003	0.0000	3.9753	3.9753	1.2900e-003	0.0000	4.0074
Paving	2.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.7400e-003	0.0271	0.0279	5.0000e-005		1.3100e-003	1.3100e-003		1.2100e-003	1.2100e-003	0.0000	3.9753	3.9753	1.2900e-003	0.0000	4.0074

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.3800e-003	6.5000e-004	1.0000e-005	1.4000e-004	1.0000e-005	1.5000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.5465	0.5465	3.0000e-005	0.0000	0.5474
Worker	1.5000e-004	1.2000e-004	1.3600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3371	0.3371	1.0000e-005	0.0000	0.3373
Total	2.3000e-004	2.5000e-003	2.0100e-003	1.0000e-005	5.0000e-004	1.0000e-005	5.1000e-004	1.4000e-004	1.0000e-005	1.5000e-004	0.0000	0.8836	0.8836	4.0000e-005	0.0000	0.8847

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.547726	0.045437	0.201480	0.122768	0.016614	0.006090	0.019326	0.029174	0.002438	0.002359	0.005005	0.000677	0.000907

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
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Consumer Products	4.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7000e-004	1.7000e-004	0.0000	0.0000	1.9000e-004
Total	5.6000e-004	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7000e-004	1.7000e-004	0.0000	0.0000	1.9000e-004

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7000e-004	1.7000e-004	0.0000	0.0000	1.9000e-004
Total	5.6000e-004	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7000e-004	1.7000e-004	0.0000	0.0000	1.9000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

APPENDIX C

UPDATED BIOLOGICAL AND JURISDICTIONAL WATERS RESOURCES

May 13, 2024

Michelle Morrison
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The Metropolitan Water District of Southern California
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VIA EMAIL
MMorrison@mwdh2o.com

Subject: Updated Biological and Jurisdictional Waters Resources Assessment for the Metropolitan Water District West Valley Feeder No. 1 Stage 3 Improvements Project in the City of Los Angeles, California

Dear Michelle Morrison:

This Letter Report presents the updated conclusions of a biological and jurisdictional waters resources assessment for The Metropolitan Water District of Southern California (MWD) West Valley Feeder No. 1 (WVF1) Stage 3 Improvements project (hereinafter referred to as the “project”) located in the City of Los Angeles, Los Angeles County, California (Exhibit 1). The purpose of the field surveys was to evaluate the potential biological and jurisdictional constraints on the project; determine the presence or absence of special status species, identify potential impacts to biological and jurisdictional water resources that could result from implementation of the project; and provide recommendations to avoid, minimize, and/or mitigate significant impacts.

PROJECT DESCRIPTION AND LOCATION

The project involves modification of the MWD WVF1 located northwest of Chatsworth Park South. Proposed project actions include construction of an approximately 500-foot access road including a vehicle turnaround area and various modifications to existing facilities including valve relocation, equipment replacement, and reconstruction of valve structures. Additionally, the project proposes the installation of new manholes, concrete vaults, and retaining walls along the WVF1. Project impacts would include both temporary impacts in areas associated with construction access, staging, and laydown areas as well as permanent impacts associated with the proposed access road. Except for those areas where impacts would be confined to existing structures and the surrounding paved areas, all other impact areas occurring would be subject to some degree of earth disturbance.

The project site is in the western portion of the San Fernando Valley in the City of Los Angeles (Exhibit 1). Surrounding land uses include undeveloped open space in the Santa Susana Pass State Historic Park to the west and Chatsworth Park South to the east, with urban development farther to the east. A Metrolink railroad alignment is located immediately north of the site. The project site occurs on the U.S. Geological Survey’s (USGS’) Oat Mountain 7.5-minute quadrangle at Township 2 North, Range 17 West, Sections 13 and 14 (Exhibit 2). Topography in the survey area includes slopes and eastward-draining canyons; elevations range from approximately 1,010 feet above mean sea level (msl) in the east to 1,160 feet above msl in the

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west. Soils in the survey area are mapped as rock outcrop–Gaviota complex, 30 to 75 percent slopes (Exhibit 3).

Thirteen vegetation types and other areas occur on the project site (Exhibit 4). Vegetation categories include California sagebrush–deerweed scrub, California sagebrush–bush mallow scrub, semi-natural herbaceous stand, wild oats grassland, bush mallow scrub, laurel sumac scrub, red willow/arroyo willow thicket, coast live oak woodland, coast live oak–California sycamore woodland, eucalyptus grove, disturbed, developed and ornamental.

Significant Ecological Areas

The *County of Los Angeles General Plan* originally characterized Significant Ecological Areas (SEAs) as areas that contain unique, dwindling, or other rare plant and animal resources that need to be more specifically studied for the purpose of public education, research, and other non-disruptive outdoor uses (England and Nelson 1976). Thus, the SEA designation does not prohibit development of land but signals that further study is required.

The project is located partially within the Santa Susana Mountains/Simi Hills SEA, which was adopted pursuant to the Santa Clarita Valley Area Plan Update of 2011 and the Los Angeles County General Plan Update of 2015. As noted in the 2015 Los Angeles General Plan, the main purposes for establishing the Santa Susana Mountains/Simi Hills SEA was: (a) to protect core habitats of listed species including Braunton’s milk vetch (*Astragalus brauntonii*), coastal California gnatcatcher (*Polioptila californica californica*), and least Bell’s vireo (*Vireo bellii pusillus*); (b) for protection of biotic communities, vegetative associates, and habitat of plant and animal species that are restricted in distribution in the County and regionally; and (c) to act as an essential habitat linkage between the Santa Monica Mountains to the south, San Gabriel Mountains to the east, and the Los Padres National Forest to the north.

SURVEY METHODS

Psomas Biologist Allison Rudalevige conducted an initial general plant and wildlife survey, mapped vegetation, and performed a jurisdictional delineation for the project on June 4, 2018. The general survey was repeated in 2022 and a number of focused protocol surveys were conducted including a rare plant focused protocol survey, least Bell’s vireo focused protocol survey, California gnatcatcher focused protocol survey, and a California red-legged frog focused protocol survey. A general survey and updated vegetation mapping survey were conducted in October 2023 due to the addition of previously unsurveyed project work areas. The survey area included a 100-foot buffer around all project impact areas. Representative photographs are provided in Appendix A.

Literature Review

Prior to the survey, a literature review was conducted to identify special status plants, wildlife, and habitats that have been reported to occur in the vicinity of the survey area. The California Native Plant Society’s (CNPS’) Inventory of Rare and Endangered Plants (CNPS 2023) and the California Department of Fish and Wildlife’s (CDFW’s) California Natural Diversity Database (CDFW 2023b) were reviewed. Database searches included the USGS’ Simi Valley East (also called Santa Susana), Oat Mountain, Canoga Park, and Calabasas 7.5-minute quadrangles. Resources reviewed to assist in the delineation of jurisdictional features included the U.S. Department of Agriculture, Natural Resources Conservation Service’s (USDA NRCS’) Web Soil Survey, the USDA NRCS’ Hydric Soils List (USDA NRCS 2023), and the U.S. Fish and Wildlife Service’s (USFWS’) National Wetlands Inventory (NWI) Wetland Mapper (USFWS 2023).

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Vegetation Mapping and General Survey

Vegetation was mapped on a 1-inch equals 100-foot (1"=100') scale color aerial. Nomenclature for vegetation types generally follows that of *A Manual of California Vegetation* (Sawyer et al. 2009). All plant species observed were recorded in field notes. Plant species were identified in the field or collected for subsequent identification using keys in Baldwin et al. (2012). Nomenclature of plant taxa conforms to the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2023e) for special status species and the *Jepson eFlora* (Jepson Flora Project 2023) for all other taxa.

All wildlife species detected during the course of the surveys were documented in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic signs, including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife generally follows the *Special Animals List* (CDFW 2023d) for special status species and, for other species, Center for North American Herpetology (2015) for amphibians and reptiles, the American Ornithological Society (2023) for birds, and the Smithsonian National Museum of Natural History (2011) for mammals.

Jurisdictional Delineation

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

A delineation of jurisdictional water resource boundaries was conducted concurrently with vegetation mapping and general biological surveys in order to describe the type and extent of waters regulated by the USACE, the RWQCB, and/or the CDFW. Jurisdictional features were mapped on the aerial. Non-wetland waters of the United States under the jurisdiction of the USACE were assessed based on the presence of an Ordinary High Water Mark (OHWM). The presence of wetland waters of the United States was assessed using a three-parameter approach for wetland hydrology, hydrophytic vegetation, and hydric soils, as described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). It should be noted that the RWQCB shares USACE jurisdiction unless isolated conditions are present. If conditions indicating isolated waters are present, the RWQCB takes jurisdiction using the USACE's OHWM. CDFW generally asserts jurisdiction over the top of the bank of a river, stream, or lake or to the outer limit of riparian vegetation located within or immediately adjacent to the river, stream, or lake.

SURVEY RESULTS

Vegetation Types and Other Landcovers

Approximately 10.98 acres of vegetation and other landcovers occur in the survey area (Exhibit 4; Table 1). This consists of California sagebrush–deerweed scrub, California sagebrush–bush mallow scrub, semi-natural herbaceous stand, wild oats grassland, bush mallow scrub, bush mallow–laurel sumac scrub,

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laurel sumac scrub, red willow/arroyo willow thicket, coast live oak woodland, coast live oak–California sycamore woodland, eucalyptus grove, disturbed, developed, and ornamental. These areas are described below.

TABLE 1
VEGETATION TYPES AND OTHER LANDCOVER IN THE SURVEY AREA

Vegetation Type or Other Landcover	Area (acres)	Special Status*
California sagebrush–deerweed scrub	4.01	no
California sagebrush–bush mallow scrub	0.21	no
semi-natural herbaceous stand	0.31	no
wild oats grassland	0.35	no
bush mallow scrub	0.02	no
laurel sumac scrub	1.72	no
red willow/arroyo willow thicket	0.21	yes
coast live oak woodland	0.82	no
coast live oak–California sycamore woodland	0.65	no
eucalyptus grove	0.07	no
disturbed	0.67	no
developed	1.12	no
ornamental	0.82	no
Total	10.98	

* Sensitivity is based on the California Department of Fish and Wildlife’s *California Natural Community List* (CDFW 2022a).

California Sagebrush–Deerweed Scrub

California sagebrush–deerweed scrub occurs on slopes throughout the survey area. This vegetation type is dominated by deerweed (*Acmispon glaber*; formerly *Lotus scoparius*) and California sagebrush (*Artemisia californica*), with the relative cover of each varying across the site. Other drought-deciduous sage scrub species such as California buckwheat (*Eriogonum fasciculatum*) and saw-toothed goldenbush (*Hazardia squarrosa*) occur at lower cover. The area between shrubs is dominated by red brome (*Bromus madritensis* ssp. *rubens*), with scattered tocalote (*Centaurea melitensis*), crimson fountain grass (*Pennisetum setaceum*), and large-bracted morning-glory (*Calystegia macrostegia*). Deerweed often occurs in areas with recent disturbance, such as through clearing, fire, or intermittent flooding (Sawyer et al. 2009). The eastern portion of the site burned most recently during the 2008 Sesnon Fire, while the western portion of the site burned in the 2005 Topanga Fire (Los Angeles County 2017). Deerweed stands represent an early successional community that is replaced by longer-lived shrubs typically between five and ten years after a fire (Sawyer et al. 2009). The vegetation in the survey area may represent a transition between a post-fire community and a more “typical” coastal sage scrub community.

This vegetation type corresponds to the *Artemisia californica*–*Lotus scoparius* Association in Sawyer et al. (2009), which consists of mixed stands of California sagebrush with other shrubs sub-dominant. It is not considered a sensitive natural community by the CDFW.

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California Sagebrush–Bush Mallow Scrub

California sagebrush–bush mallow scrub occurs in the eastern portion of the survey area. This vegetation type is similar to the California sagebrush–deerweed scrub but is dominated by a mix of chaparral mallow (*Malacothamnus fasciculatus*) and California sagebrush. Bush mallow associations represent post-fire conditions, and individual shrubs are suppressed by longer-lived shrubs within a decade after a fire (Sawyer et al. 2009). Therefore, this area may also represent a transition between a post-fire community and a more “typical” coastal sage scrub or chaparral community.

This vegetation type does not correspond to a named alliance or association in Sawyer et al. (2009). Its composition is similar to the *Malacothamnus fasciculatus* Shrubland Alliance, though the cover of bush mallow is less than the required cover (i.e., 50 percent) for that alliance. Since neither the *Artemisia californica* Shrubland Alliance nor the *Malacothamnus fasciculatus* Shrubland Alliance are considered sensitive natural communities by the CDFW, the California sagebrush–bush mallow scrub in the survey area is not considered sensitive.

Semi-natural Herbaceous Stand

Semi-natural herbaceous stands occur adjacent to the access roads throughout the survey area. This vegetation consists of non-native, weedy species such as grayish shortpod mustard (*Hirschfeldia incana*), tocalote, red brome, and round-leaved filaree (*Erodium cicutarium*), with no single species dominant. These species are typical of disturbed areas. Scattered natives, such as deerweed, saw-toothed goldenbush, large-bracted morning-glory, fascicled tarplant (*Deinandra fasciculata*), and sapphire eriastrum (*Eriastrum saphirinum*) are also present.

This vegetation type corresponds to various semi-natural herbaceous stands in Sawyer et al. (2009). Being dominated by non-native species, it is not considered a sensitive natural community by the CDFW.

Wild Oats Grassland

Wild oats grassland occurs in a patch in the western portion of the survey area. This vegetation type is dominated by wild oat (*Avena* sp.). Scattered coastal sage scrub species, such as wishbone bush (*Mirabilis laevis* var. *crassifolia*) also occur.

This vegetation type corresponds to the *Avena (barbata, fatua)* semi-natural herbaceous stand in Sawyer et al. (2009). Being dominated by a non-native species, it is not considered a sensitive natural community by the CDFW.

Bush Mallow Scrub

Bush mallow scrub occurs in a few discrete patches in the survey area. This vegetation type is dominated by chaparral mallow at a cover greater than 50 percent. As discussed above, these areas may represent a transition between a post-fire community and a more “typical” coastal sage scrub or chaparral community.

This vegetation type corresponds to the *Malacothamnus fasciculatus* Shrubland Alliance in Sawyer et al. (2009). It is not considered a sensitive natural community by the CDFW.

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Laurel Sumac Scrub

Laurel sumac scrub occurs on slopes throughout the survey area. This vegetation type consists of large individuals or stands of laurel sumac (*Malosma laurina*).

This vegetation type corresponds to the *Malosma laurina* Shrubland Alliance in Sawyer et al. (2009). It is not considered a sensitive natural community by the CDFW.

Red Willow/Arroyo Willow Thicket

Red willow/arroyo willow thicket occurs along a portion of Drainage 1 in the western portion of the survey area. This vegetation type is dominated by a canopy of red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*). The understory is partly open with some areas containing western poison oak (*Toxicodendron diversilobum*) or cattail (*Typha* sp.).

This vegetation type corresponds to the *Salix laevigata*–*Salix lasiolepis* Association in Sawyer et al. (2009). It is considered a sensitive natural community by the CDFW. It is also associated with water resources under the jurisdiction of the USACE, the RWQCB, and/or the CDFW, as discussed below.

Coast Live Oak Woodland

Coast live oak woodland occurs on upland slopes of the survey area. This vegetation type consists of individual coast live oak (*Quercus agrifolia*) that are not associated with the on-site drainages.

This vegetation type corresponds to the *Quercus agrifolia* Woodland Alliance in Sawyer et al. (2009). It is not considered a sensitive natural community by the CDFW.

Coast Live Oak–California Sycamore Woodland

Coast live oak–California sycamore woodland occurs along the drainages in the survey area. This vegetation type consists of a closed canopy of coast live oaks with some western sycamore (*Platanus racemosa*). The lower canopy and understory contain blue elderberry (*Sambucus nigra* ssp. *caerulea*), laurel sumac, mugwort (*Artemisia douglasiana*), and western poison oak.

This vegetation type corresponds to the *Quercus agrifolia*–*Platanus racemosa*/Toxicodendron *diversilobum* Association in Sawyer et al. (2009). It is not considered a sensitive natural community by the CDFW. However, it is associated with water resources under the jurisdiction of the USACE, the RWQCB, and/or the CDFW, as discussed below.

Eucalyptus Grove

Eucalyptus grove occurs adjacent to the existing Calleguas Municipal Water District facility at the western end of the survey area. This vegetation type is dominated by non-native silver dollar gum (*Eucalyptus polyanthemos*) with pepper tree (*Schinus molle*).

This vegetation type corresponds to the *Eucalyptus (globulus, camaldulensis)* semi-natural woodland stand in Sawyer et al. (2009). Being dominated by non-native species, it is not considered a sensitive natural community by the CDFW.

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Disturbed

Disturbed landcover consists of graded, dirt access roads throughout the survey area. These areas are unvegetated or contain sparse weedy vegetation.

Developed

Developed landcover consists of paved roads in the survey area and the existing Calleguas Municipal Water District facility.

Ornamental

Ornamental landcover consists of landscaped areas containing non-native ornamental vegetation. On the project site, these areas consisted predominantly of turf grass as part of a park field near the entrance to Chatsworth Park South.

Jurisdictional Resources

Jurisdictional resources in the survey area includes one main drainage channel to the west (Drainage 1) with one tributary channel (Drainage 1A) and a second large drainage (Drainage 2) towards the center of the site (Exhibit 5; Table 2). The NWI maps Drainage 1 as a Riverine, intermittent streambed that is temporarily flooded. Soils in the survey area are not listed as hydric (USDA NRCS 2023).

TABLE 2
JURISDICTIONAL WATER RESOURCES IN THE SURVEY AREA

Jurisdiction	Drainage 1 (acres)	Drainage 2 (acres)	Total
USACE	-	-	-
wetland waters of the United States	0.02	0.00	0.02
non-wetland waters of the United States	0.04	0.03	0.07
RWQCB	0.06	0.03	0.09
CDFW	0.74	0.50	1.24

USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife

* The riparian canopy extends over both Drainages 1 and 1A; acreage for both channels is included under Drainage 1.

U.S. Army Corps of Engineers

The on-site drainage channels connect with the City of Los Angeles' subsurface municipal separate storm sewer system (MS4), which carries flow to the Los Angeles River. The Los Angeles River discharges into the Pacific Ocean, a Traditional Navigable Water (TNW). Drainage 1 had flowing water during the summer 2018 site visit and the spring and summer 2022 site visits. The presence of surface water during the dry season indicates that these drainages may be considered to be relatively permanent, non-navigable tributaries to a TNW. Therefore, Drainage 1 would be considered waters of the United States. It exhibited evidence of bed, bank, and OHWM. Indicators of an OHWM include a change in vegetation cover and composition, break in bank slope, and drift deposits.

Drainage 1A did not have flowing water at the time of the surveys or exhibit indicators of wetland hydrology. It had a bed and near vertical banks with an accumulation of leaf litter consistent with the surrounding hillsides. Drainage 1A exhibits the features of an ephemeral body. Ephemeral waters are no

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longer jurisdictional under Section 404 of the Clean Water Act due to the recent Sacket decision [*Sackett v. Environmental Protection Agency*, 598 U.S. ____ (2023)]. However, Drainage 1A remains under the jurisdiction of the RWQCB, an isolated water of the State, and CDFW.

Drainage 1 exhibited evidence of wetland hydrology (e.g., surface water, drift deposits, drainage patterns). The majority of the drainage was under a coast live oak canopy (an upland species) either lacking understory vegetation or with western poison oak (a facultative upland species) (Lichvar et al. 2016) and would not meet the hydrophytic vegetation criterion for wetlands. Therefore, the portion of Drainage 1 with an oak canopy would be considered non-wetland waters of the United States. A portion of Drainage 1 had a canopy of red willow and arroyo willow, with an understory containing western poison oak or cattail in small patches. Both willow species observed on-site are considered facultative wetland species and cattail is considered an obligate wetland species. A soil test pit was not dug due to inaccessibility of the channel in this area (i.e., the presence of poison oak and dense riparian vegetation as well as the steepness of the surrounding slopes prevented safe access); therefore, the presence of hydric soils could not be confirmed. However, given the presence of flowing water during the dry season and the dominance of facultative wetland species with a small amount of obligate wetland species present in the channel, the portion of the drainage containing willows can be inferred to be wetland waters of the United States. Drainage 2 similarly carries flow to the Los Angeles River and is considered jurisdictional waters of the United States because the Los Angeles River discharges into the Pacific Ocean, a TNW.

Approximately 0.09 acre of waters of the United States (0.02-acre wetland and 0.07-acre non-wetland) occur in the survey area (Exhibit 5; Table 2).

Regional Water Quality Control Board

Regional Water Quality Control Board extends to all waters of the U.S. on-site and one isolated drainage (Drainage 1A). Approximately 0.09 acre of waters of the State, including drainage 1A, occur in the survey area (Exhibit 5; Table 2).

California Department of Fish and Wildlife

CDFW jurisdiction in the survey area extends to the outer dripline of riparian vegetation (i.e., coast live oak–California sycamore woodland and red willow/arroyo willow thicket). Approximately 1.24 acres of jurisdictional resources under the regulatory authority of the CDFW occur in the survey area (Exhibit 5; Table 2). This includes 0.21 acre of red willow/arroyo willow thicket.

Wildlife Habitat

The survey area provides moderate to high quality habitat for wildlife. The presence of human intrusion into the area on dirt access roads and trails and surrounding urban development decrease the wildlife value relative to undisturbed areas.

No fish species were observed during the 2022 focused surveys and the drainages in the survey area provide minimal habitat for fish due to the limited amount of surface water present and the isolated nature of the drainages in the survey area. Western mosquitofish (*Gambusia affinis*), a non-native species used for vector control, could potentially be present in the area if released.

During the 2022 focused surveys, the only amphibian species that was observed was the Northern Pacific treefrog (*Pseudacris regilla*). Common species that may also occur include black-bellied slender salamander (*Batrachoseps nigriventris*), western toad (*Anaxyrus boreas*), and Baja California treefrog (*Pseudacris hypochondriaca*).

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Reptile species observed during the 2022 focused surveys include: western fence lizard (*Sceloporus occidentalis*) and the common side-blotched lizard (*Uta stansburiana*). Other common species that may also occur include western skink (*Plestiodon skiltonianus*), southern alligator lizard (*Elgaria multicarinata*), ring-necked snake (*Diadophis punctatus*), California kingsnake (*Lampropeltis californiae*), gopher snake (*Pituophis catenifer*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*).

Bird species observed on or adjacent to the survey area during the 2022 focused surveys include: mallard (*Anas platyrhynchos*), California quail (*Callipepla californica*), rock pigeon (*Columba livia*), Eurasian collared-dove (*Streptopelia decaocto*), mourning dove (*Zenaida macroura*), common poorwill (*Phalaenoptilus nuttallii*), white-throated swift (*Aeronautes saxatalis*), Anna's hummingbird (*Calypte anna*), Allen's hummingbird (*Selasphorus sasin*), turkey vulture (*Cathartes aura*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttalli*), northern flicker (*Colaptes auratus*), Pacific-slope flycatcher (*Empidonax difficilis*), black phoebe (*Sayornis nigricans*), ash-throated flycatcher (*Myiarchus cinerascens*), Cassin's kingbird (*Tyrannus vociferans*), California scrub-jay (*Apelocoma californica*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), northern rough-winged swallow (*Stelgidopteryx serripennis*), barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), oak titmouse (*Baeolophus inornatus*), bushtit (*Psaltirparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), canyon wren (*Catherpes mexicanus*), Bewick's wren (*Thyromanes bewickii*), blue-gray gnatcatcher (*Poliophtila caerulea*), wrentit (*Chamaea fasciata*), American robin (*Turdus migratorius*), western bluebird (*Sialia mexicana*), California thrasher (*Toxostoma redivivum*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), phainopepla (*Phainopepla nitens*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), dark-eyed junco (*Junco hyemalis*), song sparrow (*Melospiza melodia*), spotted towhee (*Pipilo maculatus*), California towhee (*Melozona crissalis*), hooded oriole (*Icteris cucullatus*), brown-headed cowbird (*Molothrus ater*), red-winged blackbird (*Agelaius phoeniceus*), and yellow-rumped warbler (*Setophaga coronata*).

Mammal species observed during the 2022 focused surveys include: California ground squirrel (*Otospermophilus beecheyi*), desert cottontail (*Sylvilagus audubonii*) and coyote (*Canis latrans*). Other common species that may occur include Botta's pocket gopher (*Thomomys bottae*), common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and bobcat (*Lynx rufus*). Common bat species with potential to forage in the survey area include canyon bat (*Parastrellus hesperus*).

Wildlife Movement

Within large open space areas where few or no man-made or naturally occurring physical constraints to wildlife movement are present, wildlife corridors may not yet exist. However, once open space areas become constrained and/or fragmented as a result of urban development or the construction of physical obstacles (e.g., roads and highways), the remaining landscape features or travel routes that connect the larger open space areas become corridors as long as they provide adequate space, cover, food, and water and do not contain obstacles or distractions (e.g., man-made noise, lighting) that would generally hinder wildlife movement.

The survey area is located at the urban-wildland interface, with urban development to the east, large tracts of undeveloped open space to the west, and Chatsworth Park South as a buffer between the two. The existing dirt roads in the survey area have extremely minimal vehicular traffic and represent a minor barrier to wildlife movement with most species minimally deterred from efficiently crossing. Generally, wildlife are expected to move freely throughout the survey area and surroundings under existing conditions.

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Special Status Vegetation Types

The CDFW Vegetation Classification and Mapping Program provides a list of vegetation Alliances, Associations, and Special Stands that are considered to be “Sensitive Natural Communities” based on their rarity and threat (CDFW 2023c). Information on rarity is based on the range and distribution of a given type of vegetation, and the proportion of occurrences that are of good ecological integrity. Threats and trends are considered in categories like residential and commercial development, agriculture, energy production and mining, and invasive and other problematic species. One vegetation type in the survey area, red willow/arroyo willow thicket, is considered special status by the CDFW.

Special Status Plant and Wildlife Species

Plants or wildlife may be considered “special status” due to declining populations, vulnerability to habitat change, or restricted distributions. Certain special status species have been listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts.

Special Status Plants

Twenty-five special status plant species have been reported in the vicinity of the survey area (CNPS 2023; CDFW 2023b). Table 3 summarizes their status and potential to occur in the survey area inclusive of 2022 rare plant survey results.

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TABLE 3
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE VICINITY
OF THE SURVEY AREA

Species	Common Name	Federal Status	State Status	CRPR Status	Potential to Occur in the Survey Area
<i>Astragalus brauntonii</i>	Braunton's milk-vetch	FE	–	1B.1	Potentially suitable habitat present. Not observed during focused surveys.
<i>Calandrinia breweri</i>	Brewer's claudrinia	–	–	4.2	Potentially suitable habitat present. Not observed during focused surveys.
<i>Calochortus catalinae</i>	Catalina mariposa lily	–	–	4.2	Potentially suitable habitat present. Not observed during focused surveys.
<i>Calochortus clavatus</i> var. <i>gracilis</i>	slender mariposa lily	–	–	1B.2	Potentially suitable habitat present. Not observed during focused surveys.
<i>Calochortus fimbriatus</i>	late-flowered mariposa lily	–	–	1B.2	Potentially suitable habitat present. Not observed during focused surveys.
<i>Calochortus plummerae</i>	Plummer's mariposa lily	–	–	4.2	Potentially suitable habitat present. Not observed during focused surveys.
<i>Calystegia peirsonii</i>	Peirson's morning-glory	–	–	4.2	Not expected to occur; outside current known range. Not observed during focused surveys.
<i>Cercocarpus betuloides</i> var. <i>blancheae</i>	island mountain-mahogany	–	–	4.3	Not expected to occur; outside current known range. Not observed during focused surveys.
<i>Chorizanthe parryi</i> var. <i>fernandina</i>	San Fernando Valley spineflower	FC	SE	1B.1	Potentially suitable habitat present and historic occurrence from Chatsworth Park (CCH 2022; 1901 record). Not observed during focused surveys.
<i>Convolvulus simulans</i>	small-flowered morning-glory	–	–	4.2	Limited potential to occur; marginally suitable habitat. Not observed during focused surveys.
<i>Deinandra minthornii</i>	Santa Susana tarplant	–	SR	1B.2	Potentially suitable habitat present and reported just southwest of survey area (CCH 2022). Not observed during focused surveys.
<i>Dodecahema leptoceras</i>	slender-horned spineflower	FE	SE	1B.1	Limited potential to occur; marginally suitable habitat and at edge of current known range. Not observed during focused surveys.
<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	Blochman's dudleya	–	–	1B.1	Not expected to occur; outside current known range. Not observed during focused surveys.
<i>Dudleya multicaulis</i>	many-stemmed dudleya	–	–	1B.2	Limited potential to occur; marginally suitable habitat and at edge of current known range. Not observed during focused surveys.
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	–	–	4.2	Limited potential to occur; suitable habitat but at edge of current known range. Not observed during focused surveys.
<i>Horkelia cuneata</i> var. <i>puberula</i>	mesa horkelia	–	–	1B.1	Potentially suitable habitat present. Not observed during focused surveys.

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Species	Common Name	Federal Status	State Status	CRPR Status	Potential to Occur in the Survey Area
<i>Juglans californica</i>	Southern California black walnut	–	–	4.2	Not expected to occur; this species is visible year-round and would have been observed if present. Not observed during focused surveys.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	–	–	1B.1	Not expected to occur; no suitable habitat. Not observed during focused surveys.
<i>Lilium humboldtii</i> ssp. <i>ocellatum</i>	ocellated Humboldt lily	–	–	4.2	Potentially suitable habitat present. Not observed during focused surveys.
<i>Lupinus paynei</i>	Payne's bush lupine	–	–	1B.1	Potentially suitable habitat present. Not observed during focused surveys.
<i>Monardella hypoleuca</i> ssp. <i>hypoleuca</i>	white-veined monardella	–	–	1B.3	Not expected to occur; outside current known range. Not observed during focused.
<i>Navarretia ojaiensis</i>	Ojai navarretia	–	–	1B.1	Not expected to occur; no suitable habitat. Not observed during focused.
<i>Nolina cismontana</i>	chaparral nolina	–	–	1B.2	Potentially suitable habitat present. Not observed during focused surveys.
<i>Orcuttia californica</i>	California Orcutt grass	FE	SE	1B.1	Not expected to occur; no suitable habitat. Not observed during focused.

CRPR: California Rare Plant Rank

LEGEND:

Federal (USFWS)

FE Endangered
FT Threatened SR
FC Candidate

State (CDFW)

SE Endangered
Rare

CRPR

1B Plants Rare, Threatened, or Endangered in California and elsewhere
3 Plants about which we need more information – a review list
4 Plants of limited distribution – a watch list

CRPR Threat Code Extensions

.1 Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat)
.2 Fairly threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)
.3 Not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

Of the species reported from the literature review, five species are federally and/or State-listed Endangered, Threatened, or Rare or are candidates for listing: Braunton's milk-vetch, San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), Santa Susana tarplant (*Deinandra minthornii*), slender-horned spineflower (*Dodecahema leptoceras*), and California Orcutt grass (*Orcuttia californica*). Suitable or marginally suitable habitat for Braunton's milk-vetch, San Fernando Valley spineflower, Santa Susana tarplant, and slender-horned spineflower occur in the survey area. Results of rare plants surveys conducted in 2022 by Psomas Biologist Sarah Thomas were negative for all five of these species. The remaining species are not expected to occur in the survey area because the survey area does not support suitable habitat or soils for these species or the survey area is outside the known range of the species.

In addition to species formally listed by the resource agencies, ten species reported in the vicinity of the survey area have a California Rare Plant Rank (CRPR) of 1B. Six of these species—slender mariposa lily (*Calochortus clavatus* var. *gracilis*), late-flowered mariposa lily (*Calochortus fimbriatus*), many-stemmed dudleya (*Dudleya multicaulis*), mesa horkelia (*Horkelia cuneata* var. *puberula*), Payne's bush lupine

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(*Lupinus paynei*), and chaparral nolina (*Nolina cismontana*)—have potential to occur in the survey area due to suitable or marginally suitable habitat present. Results of rare plants surveys conducted were negative for all six of these species. The remaining four species are not expected to occur in the survey area because the survey area does not support suitable habitat or soils for these species or the survey area is outside the known range of the species.

Several plant species with a CRPR of 3 or 4 are also known from the vicinity, however, none were detected during rare plant surveys.

Special Status Wildlife

Twenty-five special status wildlife species have been reported in the vicinity of the survey area (CDFW 2023b) and an additional four species may occur in the vicinity based on the biologist’s knowledge of the species. Table 4 summarizes their status and potential to occur in the survey area inclusive of 2022 focused survey results (see Appendix B).

TABLE 4
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM
THE VICINITY OF THE SURVEY AREA

Species	Common Name	Federal Status	State Status	Potential to Occur in the Survey Area
Invertebrates	-	-	-	-
<i>Bombus crotchii</i>	Crotch bumble bee	–	CE	May occur; potentially suitable habitat.
<i>Danaus plexippus</i> pop. 1	monarch (California overwintering population)	CF	–	Not expected to occur as an overwintering population; no suitable roosting habitat.
<i>Gonidea angulata</i>	western ridged mussel	–	S2	Not expected to occur; no suitable habitat or host species present.
<i>Socalchemmis gertschi</i>	Gertsch’s socalchemmis spider	–	S1	May occur; potentially suitable habitat.
Amphibians	-	-	-	-
<i>Anaxyrus californicus</i>	arroyo toad	FE	SSC	Not expected to occur; no suitable habitat.
<i>Rana draytonii</i>	California red-legged frog	FT	SSC	Not expected to occur; marginal potentially suitable habitat; not detected during focused surveys.
<i>Spea hammondi</i>	western spadefoot	–	SSC	May occur in uplands and limited potential to breed; marginally suitable habitat.

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Species	Common Name	Federal Status	State Status	Potential to Occur in the Survey Area
<i>Taricha torosa</i>	Coast Range newt	–	SSC	Not likely to occur due to lack of observation during surveys; marginally suitable habitat.
Reptiles	-	-	-	-
<i>Anniella</i> sp.	California legless lizard	–	SSC	May occur; potentially suitable habitat.
<i>Aspidoscelis tigris stejnegeri</i>	coastal whiptail	–	SSC	May occur; potentially suitable habitat.
<i>Emys marmorata</i>	western pond turtle	CF	SSC	Not expected to occur; no suitable habitat.
<i>Phrynosoma blainvillii</i>	coast horned lizard	–	SSC	May occur; potentially suitable habitat.
<i>Thamnophis hammondi</i>	two-striped garter snake	–	SSC	May occur; potentially suitable habitat.
Birds				
<i>Agelaius tricolor</i>	tricolored blackbird	–	ST, SSC	Not expected to occur; no suitable habitat.
<i>Aimophila ruficeps canescens</i>	southern California rufous-crowned sparrow	–	WL	May occur; potentially suitable habitat.
<i>Aquila chrysaetos</i>	golden eagle	–	FP	May occur for foraging; potentially suitable foraging habitat. Not expected to occur for nesting; no suitable nesting habitat.
<i>Athene cunicularia</i>	burrowing owl	–	SSC	Not expected to occur; no suitable habitat.
<i>Buteo swainsoni</i>	Swainson's hawk	–	ST	May occur for foraging; potentially suitable foraging habitat. Not expected to occur for nesting; outside the known breeding range.
<i>Poliophtila californica californica</i>	coastal California gnatcatcher	FT	SSC	Not expected to occur; potentially suitable habitat; not detected during focused surveys.

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Species	Common Name	Federal Status	State Status	Potential to Occur in the Survey Area
<i>Riparia riparia</i>	bank swallow	–	ST	May occur for foraging during migration; potentially suitable foraging habitat. Not expected to occur for nesting; outside the known breeding range.
<i>Vireo bellii pusillus</i>	least Bell's vireo	FE	SE	Not expected to occur; marginal potentially suitable habitat; not detected during focused surveys.
Mammals				
<i>Antrozous pallidus</i>	pallid bat	–	SSC	May occur for foraging and roosting; potentially suitable foraging and roosting habitat.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	–	SSC	Limited potential to occur for foraging; marginally suitable foraging habitat. Not expected to occur for roosting; no suitable roosting habitat.
<i>Euderma maculatum</i>	spotted bat	–	SSC	Limited potential to occur for foraging; marginally suitable foraging habitat. Not expected to occur for roosting; no suitable roosting habitat.
<i>Eumops perotis californicus</i>	western mastiff bat	–	SSC	May occur for foraging; suitable foraging habitat. Not expected to occur for roosting; no suitable roosting habitat.
<i>Lasiurus blossevillii</i>	western red bat	–	SSC	May occur for foraging and roosting; suitable foraging and roosting habitat.
<i>Lasiurus xanthinus</i>	western yellow bat	–	SSC	Limited potential to occur for foraging and roosting; marginally suitable foraging and roosting habitat.
<i>Macrotus californicus</i>	California leaf-nosed bat	–	SSC	Not expected to occur; outside of current known range.

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Species	Common Name	Federal Status	State Status	Potential to Occur in the Survey Area
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	–	SSC	May occur; potentially suitable habitat.

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife

LEGEND:

Federal (USFWS)

FE Endangered
FT Threatened
CF Federal Candidate

State (CDFW)

SE Endangered
ST Threatened
CE Candidate Endangered
FP Fully Protected
SSC Species of Special Concern
WL Watch List
S1 Critically Imperiled
S2 Imperiled

Of the species reported from the literature review, nine species are federally and/or State-listed Endangered or Threatened or are candidates for listing: Crotch bumble bee (*Bombus crotchii*), monarch (California overwintering population) (*Danaus plexippus* pop. 1), arroyo toad (*Anaxyrus californicus*), California red-legged frog (*Rana draytonii*), tricolored blackbird (*Agelaius tricolor*), Swainson's hawk (*Buteo swainsoni*), coastal California gnatcatcher, bank swallow (*Riparia riparia*), and least Bell's vireo. While marginal potentially suitable habitat for California red-legged frog, least Bell's vireo, and coastal California gnatcatcher is present, focused protocol surveys conducted in 2022 were negative for all three species. Swainson's hawk and bank swallow may forage in the survey area but are not expected to nest since their breeding range is outside the project region. Arroyo toad and tricolored blackbird are not expected to occur in the survey area due to lack of suitable habitat. Crotch bumble bee is not expected to occur due to lack of observation during repeated site surveys in 2022 and 2023 by qualified biologists throughout all habitat areas on site.

Golden eagle (*Aquila chrysaetos*), a State Fully Protected species, has been reported from the vicinity of the survey area and has potential to forage in the survey area.

In addition to species listed under the state and federal Endangered Species Acts, 16 Species of Special Concern (designated by CDFW) have been reported near the survey area. This number includes four bat species that may occur in the vicinity based on the Psomas biologist's knowledge of the species. Thirteen of these species—coast range newt (*Taricha torosa*), western spadefoot (*Spea hammondi*), California legless lizard (*Anniella sp.*), coast horned lizard (*Phrynosoma blainvillii*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), two-striped garter snake (*Thamnophis hammondi*), spotted bat (*Euderma maculatum*), pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis californicus*), western red bat (*Lasiurus blossevillii*), western yellow bat (*Lasiurus xanthinus*), and San Diego desert woodrat (*Neotoma lepida intermedia*)—have potential to occur in the survey area due to potentially suitable or marginally suitable habitat present. The remaining species are not expected to occur in the survey area because the survey area does not support suitable habitat for the species.

Critical Habitat

Critical Habitat is designated by the USFWS for the survival and recovery of species listed as Threatened or Endangered under the Federal Endangered Species Act (FESA). Areas designated as Critical Habitat include the physical or biological features that are essential to the survival and eventual recovery of that species. The survey area is not located in areas designated or proposed as Critical Habitat for any species.

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PROJECT IMPACTS

In order to evaluate the entire extent of potential impacts on biological and jurisdictional water resources, it is necessary to understand the various project components and whether they are direct or indirect. All reported impact areas below represent direct impact resulting from temporary disturbance (such as construction yards) or permanent disturbance including replacement of the existing resource with engineered and developed features such as roadways, infrastructure, and adjacent cut slopes.

Vegetation Types and Other Areas

Based on the construction design plans, the project would impact a total of 1.98-acres of vegetation and other landcover in the project area (Table 5; Exhibit 6). This includes a permanent impact of 0.17 acre on special status vegetation (i.e., red willow/arroyo willow thicket). In addition to being a special status vegetation type, the red willow/arroyo willow thicket in the survey area is also within the boundaries of CDFW jurisdiction and has the potential to support federally and State listed wildlife species. However, results of focused surveys for least Bell's vireo and California red-legged frog conducted in 2022 indicate these species are absent from the project site. Impacts on red willow/arroyo willow thicket remain a potential constraint on development due to the status of the vegetation type as special status.

Impacts on vegetation within the boundaries of Chatsworth Park South are limited to the center two disturbance areas, one of which is a temporary construction yard. The impacted vegetation represents a minor percentage of the vegetation occurring within the approximately 50-acre park which encompasses nearly nine acres of oak woodland, eight acres of coastal sage scrub, six acres of chaparral, and 24 acres of landscaped/developed park areas.

**TABLE 5
VEGETATION TYPES AND OTHER LANDCOVER
IMPACTED BY THE PROJECT**

Vegetation Type or Other Landcover	Temporary impact area (Acres)^a	Permanent impact area (Acres)^a	Total impact area (Acres)^a
California sagebrush–deerweed scrub	0.02	0.83	0.85
California sagebrush–bush mallow scrub	0.00	0.00	0.00
semi-natural herbaceous stand	0.01	0.07	0.08
wild oats grassland	0.00	0.05	0.05
bush mallow scrub	0.00	0.02	0.02
laurel sumac scrub	0.15	0.15	0.29
red willow/arroyo willow thicket	0.00	0.17	0.17
coast live oak woodland	0.01	0.00	0.01
coast live oak–California sycamore woodland	0.00	0.22	0.22
eucalyptus grove	0.00	0.00	0.00
disturbed	0.03	0.00	0.03
developed	0.06	0.04	0.10
ornamental	0.14	0.00	0.14
Total	0.43	1.55	1.98

^a Values based on total work limit footprints.

Note: Totals may not appear to add correctly due to rounding error.

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Jurisdictional Areas

Based on project design plans, approximately 0.02 acre of ‘wetland’ waters of the United States and waters of the State, 0.01 acre of ‘non-wetland’ waters of the United States and waters of the State, and 0.41 acre of CDFW jurisdictional waters will be impacted by the project (Table 6; Exhibit 7). Of these impacts, all 0.03 acres of State and federal waters and 0.39 acres of CDFW jurisdictional waters are considered permanent impacts. Permanent impacts are associated with the project’s conversion of natural drainage to culverted roadway. All other jurisdictional impacts are considered temporary as they would revert to pre-project conditions following short term project disturbance.

**TABLE 6
JURISDICTIONAL WATER RESOURCES
IMPACTED BY THE PROJECT**

Jurisdiction	Drainage 1 Permanent (acres)	Drainage 1 Temporary (acres)	Drainage 2 Permanent (acres)	Drainage 2 Temporary (acres)	Total
USACE	-	-	-	-	-
wetland waters of the United States	0.02	0.00	0.00	0.00	0.02
non-wetland waters of the United States	0.01	0.00	0.00	0.00	0.01
RWQCB	0.03	0.00	0.00	0.00	0.03
CDFW	0.40	0.00	0.00	0.01	0.41

USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife

* The riparian canopy extends over both Drainages 1 and 1A; acreage for both channels is included under Drainage 1.

Special Status Plant Species

Results of rare plant focused surveys were negative for all special status species including federally and State listed species—Braunton’s milk-vetch, San Fernando Valley spineflower, Santa Susana tarplant, and slender-horned spineflower. Due to their absence from the project site, these species would not be a constraint to the project and would not require permitting with resource agencies.

Special Status Wildlife Species

Results of special status species focused protocol surveys were negative for all special status species including federally and State listed species—California red-legged frog, least Bell’s vireo, and coastal California gnatcatcher (see Appendix B). Due to their absence from the project site, these species would not be a constraint to the project and would not require permitting with resource agencies.

The project may impact the following species or their habitat: coast range newt, western spadefoot, California legless lizard, coast horned lizard, coastal whiptail, two-striped garter snake, spotted bat, pallid bat, Townsend’s big-eared bat, western mastiff bat, western red bat, western yellow bat, and San Diego desert woodrat. Impacts on a small amount of habitat for these species, relative to the availability of habitat in the region, are not expected to reduce the regional population below a self-sustaining level. Therefore, impacts would be considered adverse but would not represent a constraint to the project.

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OTHER CONSIDERATIONS

Protected Trees

The City of Los Angeles Municipal Code (LAMC, Article 6 Protected Tree and Shrub Regulations, Sections 46.00 to 46.06) provides for the protection of certain “protected” tree and shrubs, which include several Southern California indigenous species that measure at least four inches of cumulative trunk diameter, four and one-half feet above ground level. Species that are defined as protected species include all indigenous oak trees (*Quercus* spp., excluding scrub oak [*Quercus berberidifolia*]); southern California black walnut (*Juglans californica* var. *californica*); western sycamore (*Platanus racemosa*); California bay (*Umbellularia californica*); Mexican elderberry (*Sambucus mexicana*); and toyon (*Heteromeles arbutifolia*). No protected tree may be relocated or removed except as provided by the LAMC (Section 46.02), without a permit issued by the Board of Public Works. The term “removed” includes any act that will cause a protected tree or shrub to die, including but not limited to acts that inflict damage upon the root system or other parts of the tree by fire, application of toxic substances, operation of equipment or machinery, or by changing the natural grade of land by excavation or filling the drip line area around the trunk.

While there are trees within the project work limits that may be protected under this ordinance, they may not be impacted because work would only occur on paved areas under the canopy. Protected shrubs are also present within the work limits and may require removal if avoidance is infeasible. If the protected trees or shrubs would be impacted by project activities, a removal permit from the City would be required.

Fish Passage

In-stream structures and construction activities have the very low potential to disrupt fish passage permanently or temporarily in areas containing fish habitat. Neither special status species nor native fish species were observed in the on-site drainages during the plant and wildlife surveys in 2022. Fish habitat in the project area was seen to be relatively poor due to the limited amount of surface water present and the isolated nature of the drainages. Natural aboveground flow is limited to a distance of less than 1,000 feet. The drainages are isolated from downstream fish populations because they connect with the City of Los Angeles’ subsurface municipal separate storm sewer system (MS4). In addition, no special status fish species have been reported from the drainages in the survey area or in the project region (CDFW 2023b). Therefore, the project as designed is not expected to impact fish passage and would not likely effect fish passage even if fish were present.

Nesting Raptors

Raptor species (i.e., birds of prey) have the potential to nest within mature trees in and adjacent to the survey area and their nests may be impacted by the project. If construction activities would occur during the raptor nesting season (i.e., generally February 1 to June 30), the loss of an active nest of any raptor species, including common raptor species, would be considered a violation of Sections 3503, 3503.5, and 3513 of the *California Fish and Game Code*.

Nesting Birds

The Migratory Bird Treaty Act (MBTA) protects migratory birds and their nests and eggs, both common and special status. Bird species protected under the provisions of the MBTA are identified by the List of Migratory Birds (50 *Code of Federal Regulations* [CFR] §10.13, as amended). In addition, Section 3503 of the *California Fish and Game Code* makes it unlawful to take, possess, or destroy any bird’s nest or

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any bird's eggs. Further, any birds in the orders Falconiformes or Strigiformes (birds of prey, such as hawks, eagles, and owls) and their nests and eggs are protected under Section 3503.5 of the California Fish and Game Code. Section 3513 of the California Fish and Game Code prohibits the take and possession of any migratory nongame bird, as designated in the MBTA. Birds have the potential to nest in the project survey area, and their nests may be impacted by the project. The loss of an active bird nest, including common species, would be considered a violation of the MBTA and Fish and Game Code.

Roosting Bats

Pallid bat, western red bat, and western yellow bat may forage and roost in mature trees or rocky outcrops in the survey area. Impacts on roosting individuals can be a potential constraint on development, depending on the size of the impacted population.

Noise

During active construction, temporary noise impacts have the potential to disrupt foraging, nesting, roosting, and/or denning activities for a variety of wildlife species. Construction noise could deter wildlife from using habitat adjacent to construction. This impact would be considered adverse but would not represent a constraint on the project because a substantial amount of similar habitat is present in the vicinity where the animals may disperse. Following construction, noise levels would be the same as current conditions.

RECOMMENDATIONS

This section includes a list of recommendations designed to reduce potential Project impacts on biological resources. These recommendations are not based on a California Environmental Quality Act (CEQA) significance determination and may or may not be reflected within CEQA Mitigation Measures. Impacts on biological resources found to be potentially significant under the CEQA will require implementation of Mitigation Measures designed to avoid, minimize, restore, and or recreate impacted resources in order to offset loss in biological resource values.

Recommendations

Based on the proposed Project's biological resource impact analysis outlined above, recommendations designed to avoid or minimize these impacts are listed below. In general, reduction of the Project's disturbance area and/reduction of impacts on special status or otherwise protected biological resources to the maximum extent feasible is recommended.

Recommendation No. 1

If more than two years have elapsed since the previous rare plant survey was conducted, it is recommended that focused surveys be reconducted to ensure that the Project avoids impacts to rare plant species. Surveys should be conducted to confirm absence within the proposed Project's disturbance areas previously determined to have the potential to support special status plant species. Surveys should be conducted in accordance with current California Native Plant Society (CNPS) protocol and will occur during the appropriate time of year.

If survey results are positive, it is recommended that efforts are made to redesign the Project to avoid indirect impacts on rare plants. If not feasible, it is recommended that

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efforts are made to redesign the Project to avoid direct impacts on rare plants. If not feasible, it is recommended that efforts are made to redesign the Project to minimize the number of individuals or acreage of population(s) directly impacted. If impacts on rare plants are unavoidable, it is recommended to prepare and implement a Special Status Plant Species Restoration Plan to reduce impacts on the impacted plant species. If the impacted rare plant is a State or federally listed species, consultation with applicable resources agencies (CDFW and/or USFWS) is recommended to determine if permitting will be required. Permit conditions, if applicable, would provide additional measures to avoid and and/or minimize impacts on State and federally threatened and endangered wildlife species.

Recommendation No. 2

If more than two years have elapsed since the previously conducted focused wildlife surveys for least Bell's vireo or California gnatcatcher, it is recommended that focused protocol surveys be repeated to ensure that the Project avoids impacts to these species. All surveys should be conducted to confirm absence within proposed Project disturbance areas that may support these species. Surveys should be conducted in accordance with the approved CDFW or U.S. Fish and Wildlife Species (USFWS) protocol guidelines for each species.

If survey results are positive, it is recommended that efforts are made to redesign the Project to avoid indirect impacts on the impacted species. If not feasible, it is recommended that efforts are made to redesign the Project to avoid direct impacts on the impacted species. If not feasible, it is recommended that efforts are made to redesign the Project to minimize the number of individuals or acreage of occupied habitat directly impacted. If impacts are unavoidable, consultation with applicable resources agencies (CDFW and/or USFWS) is recommended to determine if permitting will be required. Permit conditions, if applicable, would provide additional measures to avoid and and/or minimize impacts on State and federally threatened and endangered wildlife species.

Recommendation No. 3

In an effort to reduce potential impacts on non-listed special status wildlife species, it is recommended that a qualified biologist monitor all vegetation removal and grading to ensure that incidental construction impacts on non-listed special status and common wildlife species are avoided or minimized. Where feasible, the biological monitor will attempt to ensure wildlife are not directly impacted. It is recommended that the Biologist employ salvage methods and relocate wildlife species that can be moved that would otherwise be destroyed or adversely affected by construction and/or site-preparation activities. If wildlife is in harm's way and has not moved on its own, the Biologist will attempt to scatter them away from the area.

Recommendation No. 4

To avoid unanticipated impacts on biological resources in the immediate area, it is recommended that the designated disturbance limits are visibly marked in the field to ensure that no inadvertent impacts occur outside the approved disturbance limits.

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Recommendation No. 5

To avoid take of nesting birds or their eggs, in compliance with applicable State and federal laws pertaining to the protection of nesting birds, it is recommended that construction activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season, if feasible, which generally runs from February 1–August 31 (as early as January 1 for some raptors. “Take” means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill (*California Fish and Game Code*, Section 86), and includes take of eggs or young resulting from disturbances that cause abandonment of active nests. Depending on the avian species present, a qualified Biologist may determine that a change in the breeding season dates is warranted.

If avoidance of the avian breeding season is not feasible, it is recommended that a qualified Biologist with experience in conducting breeding bird surveys should conduct weekly bird surveys beginning 30 days prior to the initiation of Project activities, to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 500 feet of the disturbance area. The surveys should continue on a weekly basis with the last survey being conducted no more than three days prior to the initiation of Project activities. If a protected native bird is found, it is recommended that the Project activities are delayed within 300 feet of on- and off-site suitable nesting habitat (within 500 feet for suitable raptor nesting habitat) until August 31. Alternatively, a qualified Biologist could continue the surveys in order to locate any nests. If an active nest is located, Project activities within 300 feet of the nest (within 500 feet for raptor nests) or as determined by a qualified biologist, should be postponed until the nest is vacated; the juveniles have fledged; and there is no evidence of a second attempt at nesting. Flagging, stakes, or construction fencing should be used to demarcate the inside boundary of the buffer of 300 feet (or 500 feet) between the Project activities and the nest. Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area.

If the qualified biologist determines that a narrower buffer between the Project activities and observed active nests is warranted (based on species-specific information; ambient conditions and birds’ habituation to them; and the terrain, vegetation, and birds’ lines of sight between the Project activities and the nest and foraging areas), the modified buffer may be used.

It is recommended that the qualified biologist be present on site during all grubbing and clearing of vegetation to ensure that these activities remain within the Project footprint to minimize the likelihood that active nests are abandoned or fail due to Project activities.

Recommendation No. 6

To avoid and or minimize impacts on bats, it is recommended that a qualified biologist conduct a field survey no earlier than 20 days prior to any grading activity that would occur during the breeding season (i.e., April 1 through August 31) of native bat species that potentially utilize the site. This should be done to determine if active maternity roosts of special status bats (such as pallid bat) are present in the applicable habitats on the site (e.g., woodlands). If active roosts are found, construction within 200 feet should be postponed or halted until the roost is vacated and juveniles are self-sufficient, as determined by the biologist.

Ms. Michelle Morrison
May 13, 2024
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Recommendation No. 7

In an effort to avoid or reduce impacts special status vegetation types, it is recommended that attempts are made to avoid direct impacts. If not feasible, it is recommended that efforts are made to redesign the Project to minimize the acreage of special status vegetation types directly impacted. If impacts on special status vegetation types are unavoidable, it is recommended to prepare and implement a Habitat Restoration Plan to restore impacted habitat areas or increase acreage elsewhere in the vicinity to reduce impacts on the special status vegetation types of the region. If the impacted special status vegetation types are considered jurisdictional under the Clean Water Act and/or Fish and Game Code, consultation with applicable resources agencies is recommended to determine if permitting will be required. Permit conditions, if applicable, would provide additional measures to avoid and and/or minimize impacts on impacted vegetation types within these jurisdictions.

Recommendation No. 8

To avoid or reduce impacts to protected trees (as defined by City of Los Angeles Municipal Code), it is recommended that all protected trees in the Project area are identified and direct impacts are avoided. If not feasible, it is recommended that efforts are made to redesign the Project to minimize the number of protected trees impacted. If impacts on protected trees are unavoidable, compliance with the City of Los Angeles Municipal Code requirements is recommended.

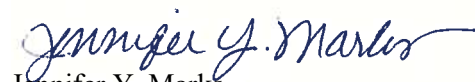
Recommendation No. 9

Prior to any fill of or alteration to jurisdictional drainages, wetlands, and/or associated riparian vegetation on the Project site, it is recommended that attempts are made to redesign the Project to avoid all direct impacts. If not feasible, it is recommended that efforts are made to minimize the acreage of impacted jurisdictional area. If impacts on jurisdictional areas are unavoidable, it is recommended to prepare and implement a Habitat Restoration Plan to create, enhance, and/or restore acreage to ensure that net habitat values are at least equal to those lost from Project implementation to reduce impacts on the jurisdictional features of the region. Consultation with applicable resources agencies is recommended to determine if permitting will be required. If required, it is recommended that the appropriate regulatory agency permits and/or agreements from the USACE, the CDFW, and the applicable RWQCB are obtained. Permit conditions, if applicable, would provide additional measures to avoid and and/or minimize impacts on impacted jurisdictional resources within these jurisdictions.

If you have any questions or comments, please contact Marc Blain at (626) 351-2000.

Sincerely,

P S O M A S



Jennifer Y. Marks
Senior Project Manager



Marc T. Blain
Senior Biologist

Ms. Michelle Morrison

May 13, 2024

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Enclosures: Exhibits 1–7

Appendix A – Representative Photographs

Appendix B – Focused Survey Reports

- California Gnatcatcher Protocol Survey Report
- Least Bell's Vireo Protocol Survey Report
- California Red-legged Frog Protocol Survey Report

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REFERENCES

- American Ornithological Society (AOS). 2018 (October). *Check-list of North and Middle American Birds* (7th ed., as revised through 58th Supplement). Washington, D.C.: AOU. <http://checklist.aou.org/>.
- Baldwin, B.G., D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (Eds.). 2012. *The Jepson Manual: Vascular Plants of California* (Second ed.). Berkeley, CA: University of California Press.
- California Department of Fish and Wildlife (CDFW). 2023a (January 24). California Natural Communities List. Natural Communities List Arranged Alphabetically by Life Form (PDF). Sacramento, CA: CDFW Biogeographic Data Branch. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153398&inline>.
- . 2023b (Oct 24). California Natural Diversity Database. Records of Occurrence for Santa Susana, Oat Mountain, Canoga Park, and Calabasas USGS 7.5-minute quadrangles. Sacramento, CA: CDFW, Natural Heritage Division.
- . 2023c. Natural Communities. Sacramento, CA: CDFW, Vegetation Classification and Mapping Program. <https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities>.
- . 2023d (October). *Special Animals*. Sacramento, CA: CDFW, Natural Heritage Division.
- . 2023e (October). *Special Vascular Plants, Bryophytes, and Lichens List*. Sacramento, CA: CDFW, Natural Heritage Division.
- California Native Plant Society (CNPS). 2023 (November 2, access date). Inventory of Rare and Endangered Plants (online edition, v8-03). Information Santa Susana, Oat Mountain, Canoga Park, and Calabasas USGS 7.5-minute quadrangles. Sacramento, CA: CNPS. <http://www.rareplants.cnps.org/>.
- Center for North American Herpetology (CNAH). 2015. *CNAH: North American Herpetofauna: California: The Amphibians, Reptiles, and Turtles of California*. Lawrence, KS: CNAH. <http://www.cnah.org/namesList.aspx?stateId=5&listType=stateList&orderId=0>
- Consortium of California Herbaria (CCH). 2023 (November, access date). Consortium of California Herbaria. Data provided by the participants of the Consortium of California Herbaria for plants listed in Table 3. Berkeley, CA: University of California. <http://ucjeps.berkeley.edu/consortium/>.
- England and Nelson Environmental Consultants (England and Nelson). 1976. *Los Angeles County Significant Ecological Area Study* (Prepared for the Los Angeles County Department of Regional Planning and Environmental Systems Research Institute). Riverside, CA: England and Nelson.
- Jepson Flora Project. 2023 (November, Revision 10). Jepson eFlora (Records for common species in the Plant Compendium. Berkeley, CA: The Jepson Herbarium. <http://ucjeps.berkeley.edu/eflora/>.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016 (April 28). The National Wetland Plant List: 2016 Wetland Ratings. *Phytoneuron* 2016-30:1–17. Fort Worth, TX: G.L. Nesom.
- Los Angeles County GIS Data Portal. 2017. Los Angeles County Fire Department – Historic Fire Perimeters. Commerce, CA: Los Angeles County Fire Department, Information Management Division. <https://egis3.lacounty.gov/dataportal/2014/04/28/fire-perimeters-1965-2013/>.

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Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation (Second Edition)*. Sacramento, CA: CNPS.

Smithsonian National Museum of Natural History (SNMNH). 2011. Mammal Species of the World (3rd ed.) (a database based on Wilson, D.E., and D. M. Reeder's 2005 publication entitled Mammal Species of the World, A Taxonomic and Geographic Reference, 3rd ed.). Washington, D.C.: SNMNH. <https://www.departments.bucknell.edu/biology/resources/msw3/>.

U.S. Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2023 (November 2, access date). State Soil Data Access Hydric Soils List. Washington, D.C.: USDA, NRCS. <http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/>.

U.S. Fish and Wildlife Service 2023 (November). Wetland Mapper [Information for the Survey Area]. Washington D.C.: USFWS, National Wetlands Inventory. <http://www.fws.gov/wetlands/Data/Mapper.html>.

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Project Location

WVF No. 1 Stage 3 Improvements Project

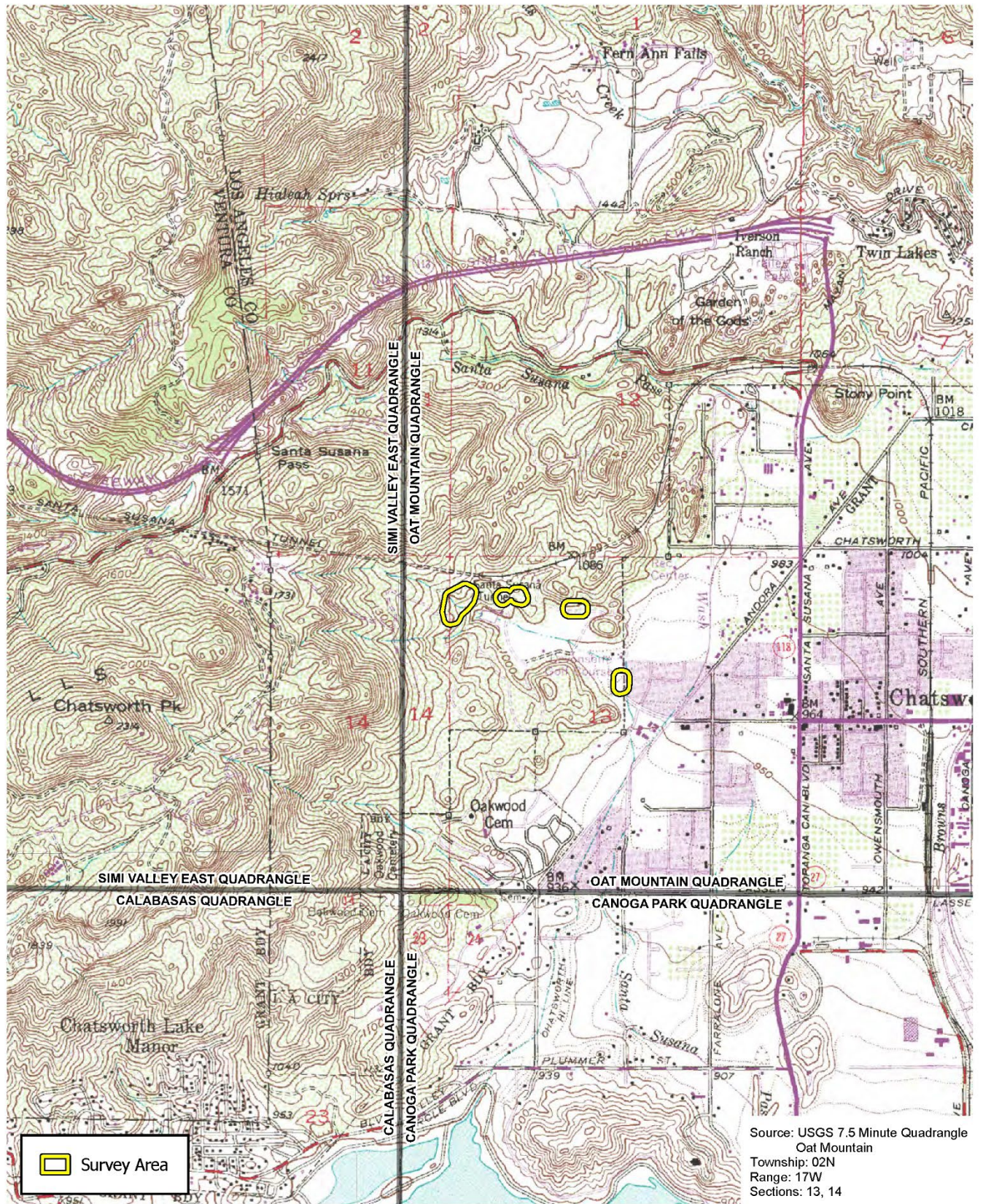


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Exhibit 1

PSOMAS

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USGS 7.5-Minute Digital Quadrangle

Exhibit 2

WVF No. 1 Stage 3 Improvements Project



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Soil Types

WWF No. 1 Stage 3 Improvements Project

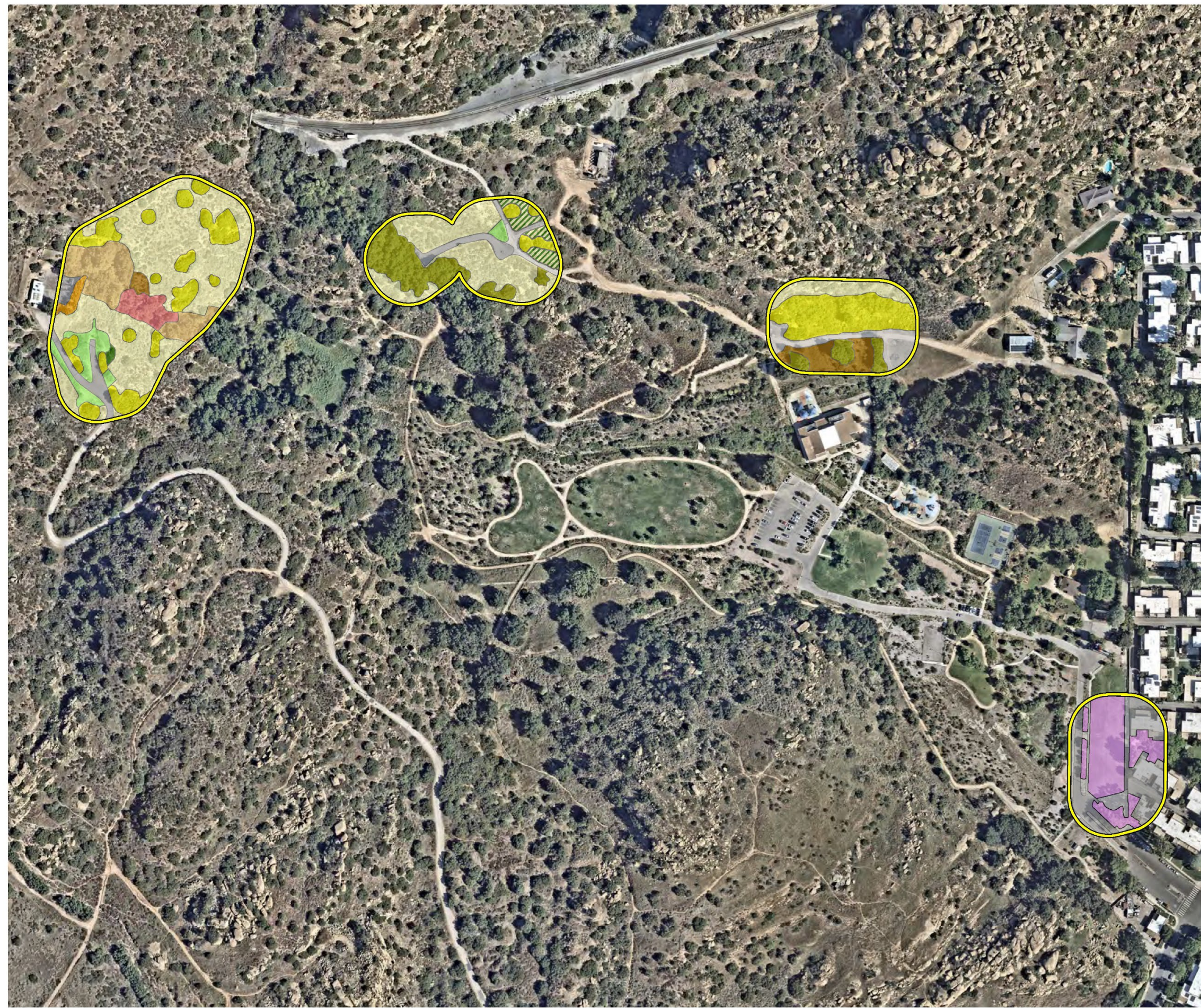


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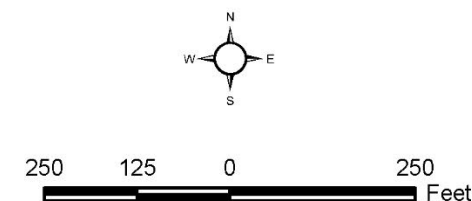
Exhibit 3



D:\Projects\3\MD\WVF\PROJ\WVF.aprx\Vegetation Map - 11x17 Landscape



-  Survey Area
- Vegetation Types and Other Areas**
-  California sagebrush–deerweed scrub
 -  California sagebrush–bush mallow scrub
 -  semi-natural herbaceous stand
 -  wild oats grassland
 -  bush mallow scrub
 -  laurel sumac scrub
 -  red willow/arroyo willow thicket
 -  coast live oak woodland
 -  coast live oak–California sycamore woodland
 -  eucalyptus grove
 -  disturbed
 -  developed
 -  ornamental



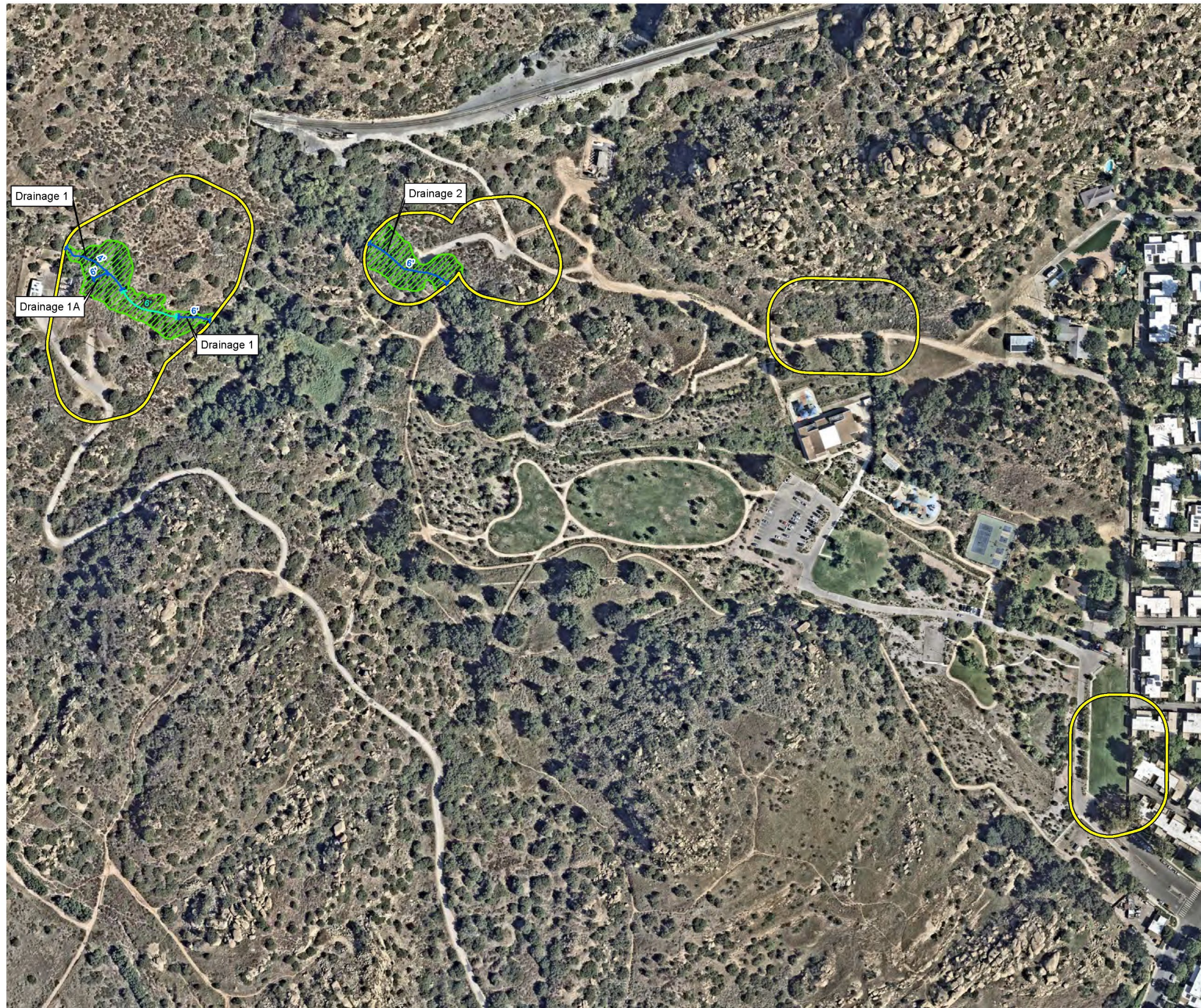
Aerial Source: Nearmap 09/2023

Vegetation Types and Other Areas Exhibit 4
WVF No. 1 Stage 3 Improvements Project

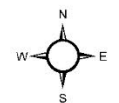


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- Survey Area
- USACE/RWQCB Jurisdiction - non-wetland (width in feet)
- USACE/RWQCB Jurisdiction - wetland (width in feet)
- CDFW Jurisdiction



250 125 0 250 Feet

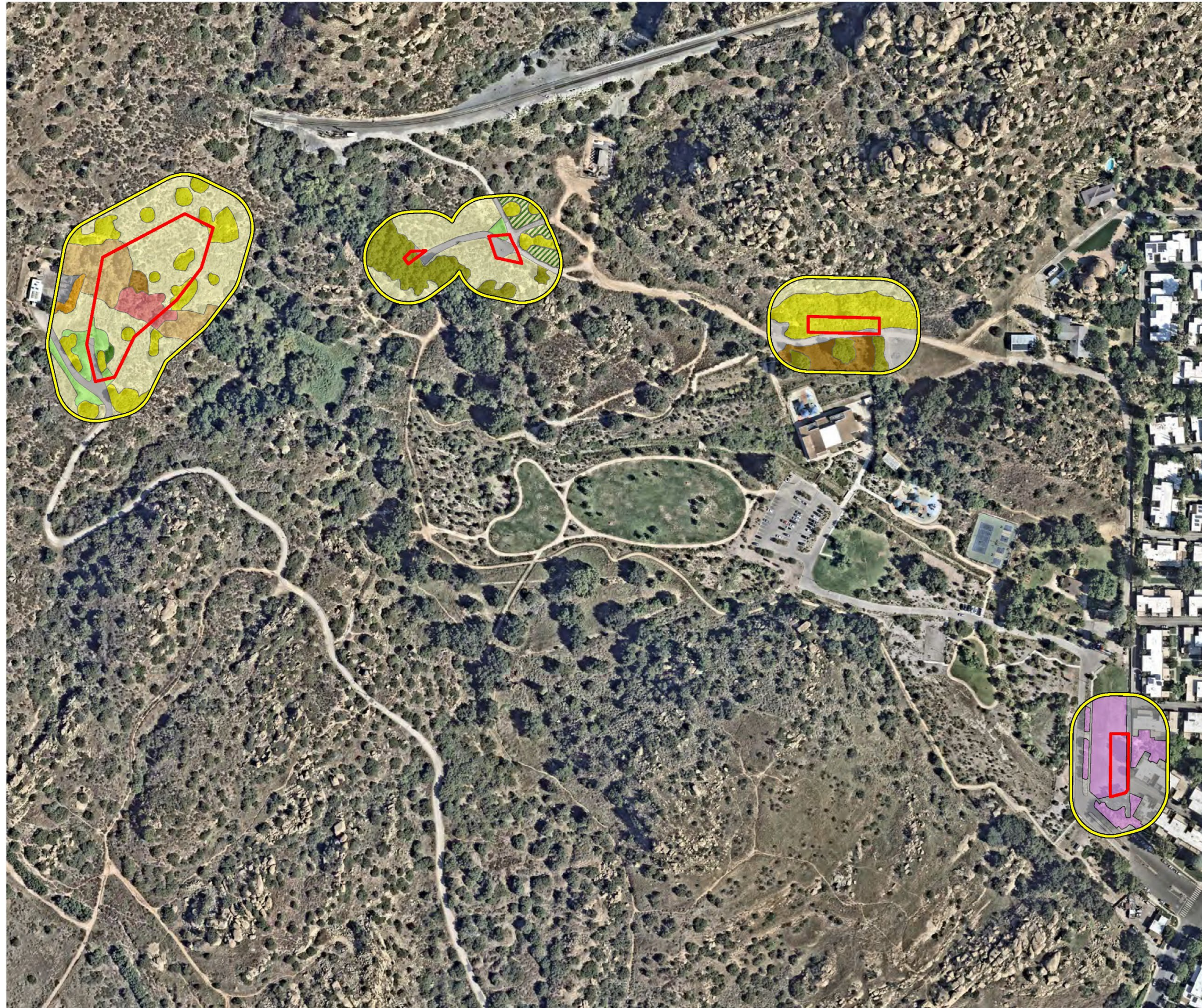
Aerial Source: Nearmap 09/2023

Jurisdictional Resources Exhibit 5

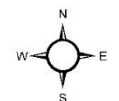
WVF No. 1 Stage 3 Improvements Project



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- Survey Area
- Impact Areas
- Vegetation Types and Other Areas**
- California sagebrush-deerweed scrub
 - California sagebrush-bush mallow scrub
 - semi-natural herbaceous stand
 - wild oats grassland
 - bush mallow scrub
 - laurel sumac scrub
 - red willow/arroyo willow thicket
 - coast live oak woodland
 - coast live oak-California sycamore woodland
 - eucalyptus grove
 - disturbed
 - developed
 - ornamental



250 125 0 250 Feet

Aerial Source: Nearmap 09/2023

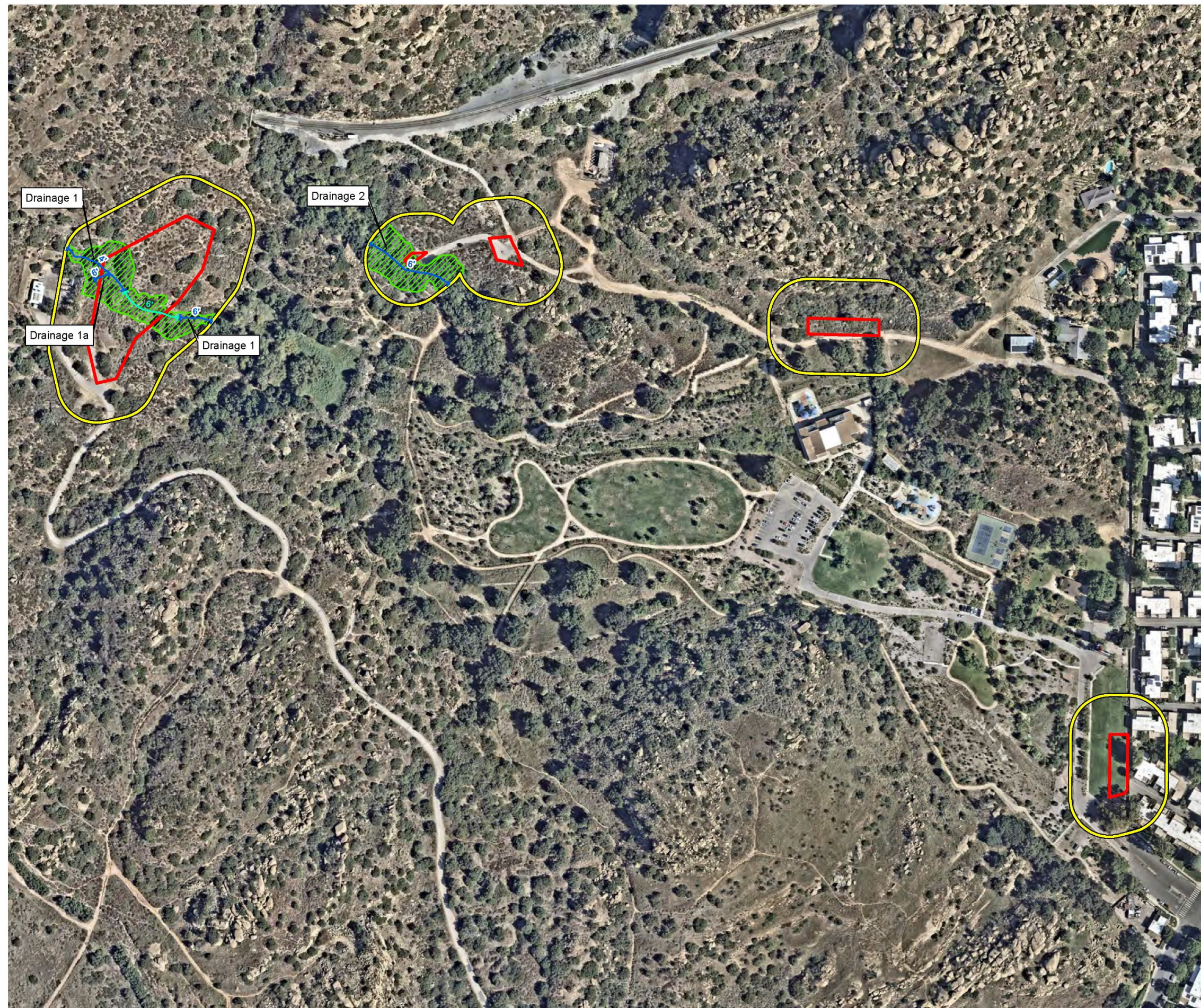
Impacts to Vegetation
Types and Other Areas

WVF No. 1 Stage 3 Improvements Project

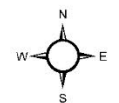
Exhibit 6



D:\Projects\3M\MD\WV\PROJ\WV\Fmap\JD Impact Map - 11x17 Landscape



- Survey Area
- Impact Areas
- USACE/RWQCB Jurisdiction - non-wetland (width in feet)
- USACE/RWQCB Jurisdiction - wetland (width in feet)
- CDFW Jurisdiction



250 125 0 250 Feet

Aerial Source: Nearmap 09/2023

Impacts to Jurisdictional Resources Exhibit 7

WV No. 1 Stage 3 Improvements Project



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APPENDIX A
REPRESENTATIVE PHOTOGRAPHS



California sagebrush–deerweed scrub in the western portion of the survey area.



California sagebrush–bush mallow scrub in the eastern portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A–1





Semi-natural herbaceous stand in the western portion of the survey area.



Laurel sumac scrub in the western portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-2



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Red willow/arroyo willow thicket in the western portion of the survey area.



Coast live oak–California sycamore woodland in the western portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-3





Eucalyptus grove in the western portion of the survey area.



Disturbed area in eastern portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-4





WWF1 STA 1416+33 existing blowoff (to be abandoned).



WWF1 STA 1407+45 existing blowoff.

Representative Photographs

WWF No. 1 Stage 3 Improvements Project

Attachment A-5





Along existing access trail to WWF1 STA 1415+42 proposed vault and pump well.



Contractor's laydown area in the western portion of the survey area.

Representative Photographs

WWF No. 1 Stage 3 Improvements Project

Attachment A-6



APPENDIX B
FOCUSED SURVEY REPORTS

August 17, 2022

Mr. Chris Kofron
Recovery Permit Coordinator
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, California 93003

VIA EMAIL
chris_kofron@fws.gov

Subject: Results of Focused Presence/Absence Surveys for the Coastal California Gnatcatcher for the Metropolitan Water District West Valley Feeder No. 1 Stage 3 Improvements Project in the City of Los Angeles, California

Dear Mr. Kofron:

This Letter Report presents the results of focused surveys for the coastal California gnatcatcher (*Poliophtila californica californica*) for the Metropolitan Water District West Valley Feeder No. 1 Stage 3 Improvements Project (hereinafter referred to as the “project site”) located in the City of Los Angeles in Los Angeles County, California. The purpose of the surveys was to determine the presence or absence of the coastal California gnatcatcher on or immediately adjacent to the project site. Surveys were conducted by Psomas Biologists who hold the necessary Federal Endangered Species Act (FESA) survey permit and were completed according to the guidelines established by the U.S. Fish and Wildlife Service (USFWS). Notification of the intent to conduct protocol-level surveys was submitted to the USFWS on May 11, 2022.

PROJECT DESCRIPTION AND LOCATION

The project involves modification of the MWD WVF1 located northwest of Chatsworth Park South, in the City of Los Angeles. Proposed project actions include construction of an approximately 500-foot access road including a vehicle turnaround area and various modifications to existing facilities including valve relocation, equipment replacement, and reconstruction of valve structures. Additionally, the project proposes the installation of new manholes, concrete vaults, and retaining walls along the WVF1. Project impacts would include both temporary impacts in areas associated with construction access, staging, and laydown areas as well as permanent impacts associated with the proposed access road. Except for those areas where impacts would be confined to existing structures and the surrounding paved areas, all other impact areas occurring would be subject to some degree of earth disturbance.

The project site is in the western portion of the San Fernando Valley in the City of Los Angeles (Exhibit 1). Surrounding land uses include undeveloped open space in the Santa Susana Pass State Historic Park to the west and Chatsworth Park South to the east, with urban development farther to the east. The project site occurs on the U.S. Geological Survey’s (USGS’) Oat Mountain 7.5-minute quadrangle at Township 2 North, Range 17 West, Sections 13 and 14 (Exhibit 2). Topography in the survey area includes slopes and eastward-draining canyons; elevations range from approximately 1,010 feet above mean sea level (msl) in the east to 1,160 feet above msl in the west.

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Mr. Chris Kofron
August 17, 2022
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Thirteen vegetation types and other areas occur on the project site (Exhibit 3). Vegetation categories include California sagebrush–deerweed scrub, California sagebrush–bush mallow scrub, semi-natural herbaceous stand, wild oats grassland, bush mallow scrub, bush mallow–laurel sumac scrub, laurel sumac scrub, red willow/arroyo willow thicket, coast live oak woodland, coast live oak–California sycamore woodland, eucalyptus grove, disturbed, and developed.

SURVEY AREA

The coastal California gnatcatcher survey was conducted in all areas containing potentially suitable habitat (i.e., California sagebrush–deerweed scrub, and California sagebrush–bush mallow scrub) within the project site and within 500 feet of the project site. Photographs of representative habitat on the project site are provided in Attachment A.

BACKGROUND

Recent taxonomic studies indicate that the California gnatcatcher consists of four subspecies that extend from southwestern California to southern Baja California, Mexico. The coastal California gnatcatcher, the northernmost gnatcatcher subspecies, is restricted to lowland areas from central Ventura County through Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties to the Baja California, Mexico border (Atwood and Lerman 2006; Mellink and Rea 1994). Previously, the coastal California gnatcatcher was common from the San Fernando Valley east along the base of the San Gabriel Mountains to Claremont (Atwood 1990). It is now rare in the northern part of its range, with a handful of sightings from Santa Clarita to Tujunga Wash, though a small population persists near Moorpark in Ventura County. The coastal California gnatcatcher has been recorded from sea level to approximately 3,000 feet above msl (USFWS 2003); however, more than 90 percent of gnatcatcher records are from elevations from sea level to 820 feet above msl along the coast (Atwood and Bolsinger 1992; MBA 1991) and between sea level and 1,800 feet above msl inland. USFWS estimates regarding the population size of the coastal California gnatcatcher in Southern California have been about 3,000 pairs (Atwood and Bontrager 2001).

The coastal California gnatcatcher typically occurs within coastal and inland sage scrub vegetation types. Sage scrub often occurs in a patchy distribution pattern throughout the gnatcatcher's range. Coastal California gnatcatchers also use chaparral, grassland, and riparian habitats that are near sage scrub. These non-sage scrub habitats are used for dispersal and foraging (Atwood et al. 1998; Campbell et al. 1998; USFWS 2003). Availability of these non-sage scrub areas is essential during certain times of the year, particularly during drought conditions or during dispersal, foraging, or nesting (USFWS 2003).

The coastal California gnatcatcher was designated as a Threatened species by the USFWS on March 25, 1993. A Special Rule was issued that would allow incidental take of coastal California gnatcatcher under Section 9 of the FESA if the take results from activities conducted in accordance with California's Natural Community Conservation Plan (NCCP) Act (USFWS 1993). For those not participating in the State's NCCP, any activity that may result in the take of coastal California gnatcatcher requires formal consultation with the USFWS under Sections 7 or 10 of the FESA.

On December 19, 2007, the USFWS published a Final Rule revising critical habitat for the coastal California gnatcatcher. The revised critical habitat designates 197,303 acres of land in San Diego, Orange, Riverside, San Bernardino, Los Angeles, and Ventura Counties as critical habitat for the coastal California gnatcatcher (USFWS 2007). The survey area is not located within the designated critical habitat for the coastal California gnatcatcher.

Mr. Chris Kofron
August 17, 2022
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SURVEY METHODS

The USFWS coastal California gnatcatcher survey protocol recommends six visits to all potentially occupied habitat areas for surveys conducted entirely within the breeding season, which extends from March 15 to June 30 (USFWS 1997a, 1997b). A total of six focused gnatcatcher surveys were conducted in the survey area with a team of two Biologists. The surveys followed USFWS guidelines for breeding season surveys and were conducted at least one week apart. All surveys were conducted during the morning hours, and no more than 80 acres of suitable habitat were surveyed per visit. Psomas Senior Biologist Lindsay Messett (USFWS Permit No. TE067064-5) and Psomas Senior Biologist Jonathan Aguayo (USFWS Permit No. TE96514A-3) conducted the focused survey visits. Surveys were conducted on May 25; and June 1, 9, 16, 23 and 30, 2022.

Weather conditions met the USFWS survey protocol requirements for optimal gnatcatcher detection. Weather conditions that were too cold (below 55 degrees Fahrenheit [°F]), too hot (above 95°F), or too windy (wind speed greater than 15 miles per hour) were avoided. Surveys were conducted by slowly walking through all appropriate habitats (i.e., coastal sage scrub) while listening and watching for gnatcatcher activity. A combination of taped recordings of gnatcatcher vocalizations and “pishing” sounds were used in an attempt to elicit responses from any gnatcatchers that might be present. The frequency of vocalization playback and “pishing” varied depending on conditions, such as habitat patch size and topography in each area. All bird species detected during the survey were recorded, including notable observations of special status birds or other wildlife species. All wildlife species detected during the surveys were recorded (Attachment B).

TABLE 1
SUMMARY OF COASTAL CALIFORNIA GNATCATCHER SURVEY CONDITIONS

Survey Number	Date	Time (Start/End)	Surveyor	Temperature (°F) (Start/End)	Wind (mph) (Start/End)	Cloud Cover (%) (Start/End)
1	May 26, 2022	8:30 AM–10:15 AM	Messett	73/80	0/1	Clear
2	June 2, 2022	9:25 AM–10:28 AM	Messett	72/78	3/5	25/Clear
3	June 9, 2022	6:48 AM–9:14 AM	Aguayo	64/72	2/3	Clear
4	June 16, 2022	7:28 AM–10:07 AM	Aguayo	69/77	1/2	Clear
5	June 23, 2022	6:13 AM–8:22 AM	Aguayo	71/77	4/2	40/10
6	June 30, 2022	8:08 AM–10:26 AM	Aguayo	72/81	4	Clear

°F: degrees Fahrenheit; mph: miles per hour; %: percent

SURVEY RESULTS

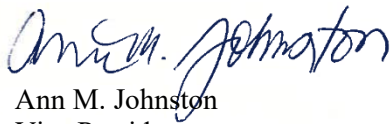
No coastal California gnatcatchers were observed or detected in the survey area during focused surveys. Photographs of representative habitat conditions on the project site are provided in Attachment A. All wildlife species detected during the surveys were recorded in field notes and are summarized in Attachment B.

Mr. Chris Kofron
August 17, 2022
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Psomas appreciates the opportunity to assist on this Project. If you have any comments or questions, please contact Marc Blain at (626) 351-2000 or Marc.Blain@psomas.com.

Sincerely,

P S O M A S



Ann M. Johnston
Vice President
Resource Management



Marc T. Blain
Senior Project Manager/Vice President
Resource Management

I certify that the information in this survey report and enclosed exhibits fully and accurately present my work.



Lindsay A. Messett, CWB®
Senior Biologist
(TE067064-5)



Jonathan Aguayo
Senior Biologist
(TE96514A-3)

Attachments: Exhibits 1, 2, and 3
A – Site Photographs
B – Wildlife Compendium

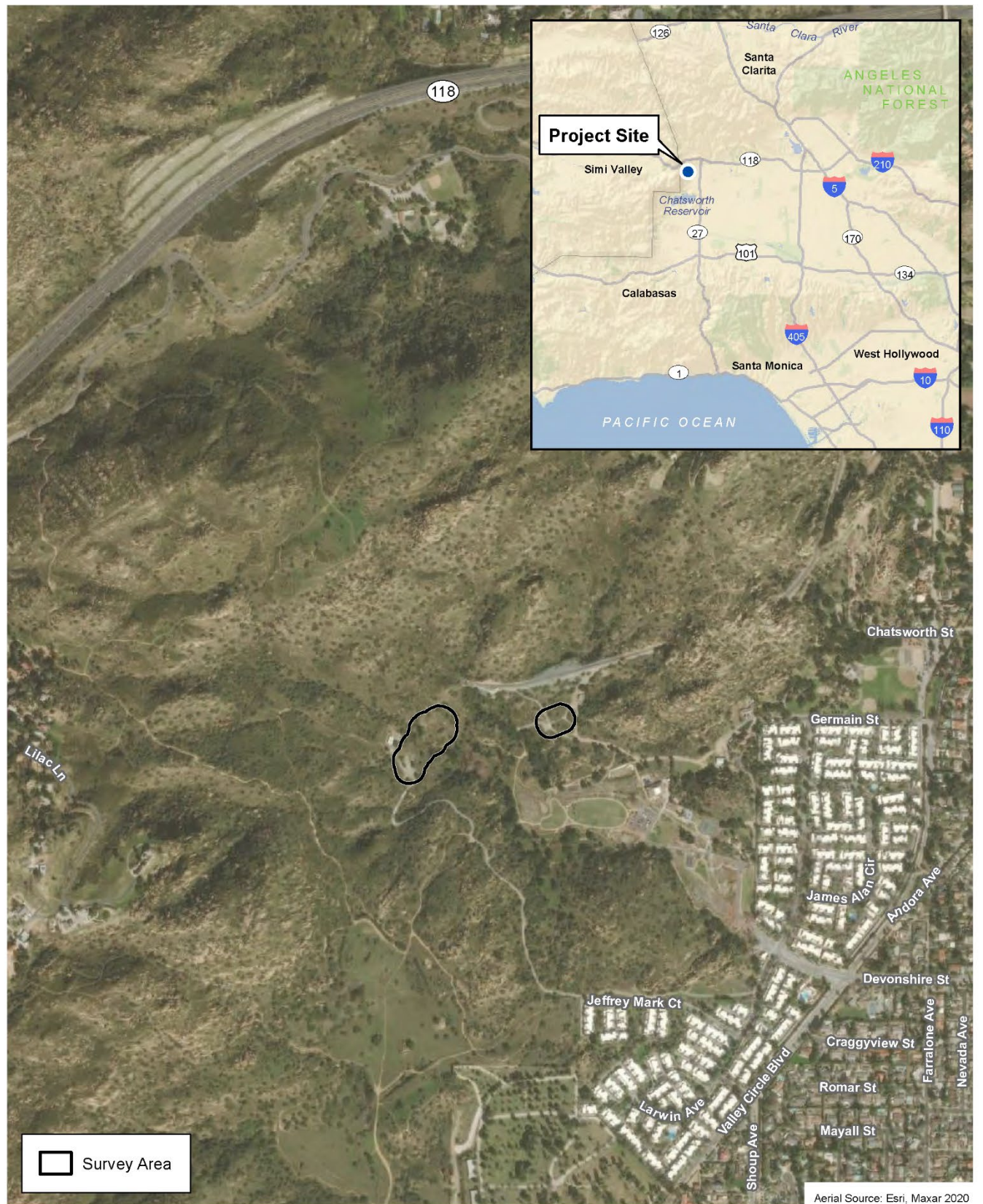
cc: Lilia Martinez, LiMartinez@mw dh2o.com

Mr. Chris Kofron
August 17, 2022
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REFERENCES

- Atwood, J.L. 1990. *Status Review of the California Gnatcatcher (Poliophtila californica)*. Manomet, MA: Manomet Bird Observatory.
- Atwood, J.L. and J.S. Bolsinger. 1992. Elevational Distribution of the California Gnatcatchers in the United States. *Journal of Field Ornithology* 63(2):159–168. Waco, TX: Ornithological Societies of North America.
- Atwood, J. L. and D.R. Bontrager. 2001. California Gnatcatcher (*Poliophtila californica*). *The Birds of North America, No. 574* (A. Poole and F. Gill, Eds.). Philadelphia, PA: The Academy of Natural Sciences.
- Atwood, J.L., D.R. Bontrager, and A.L. Gorospe. 1998. Use of Refugia by California Gnatcatchers Displaced by Habitat Loss. *Western Birds* 29: 406–412. San Diego, CA: Western Field Ornithologists.
- Atwood, J.L. and S.B. Lerman. 2006. Family Poliophtilidae (Gnatcatchers) (pp. 350–377). *Handbook of the Birds of the World. Vol. 11: Old World Flycatchers to Old World Warblers* (J. del Hoyo, A. Elliott, and D.A. Christie, Eds.). Barcelona, Spain: Lynx Ediciones.
- Campbell, K. F., R.A. Erickson, W.E. Haas, and M.A. Patten. 1998. California Gnatcatcher Use of Habitats Other Than Coastal Sage Scrub: Conservation and Management Implications. *Western Birds* 29: 421–433. San Diego, CA: Western Field Ornithologists.
- Garrett, K. and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Audubon Press.
- Mellink, E. and A.M. Rea. 1994. Taxonomic Status of the California Gnatcatchers of Northwestern Baja California, Mexico. *Western Birds* 25: 50–62. San Diego, CA: Western Field Ornithologists.
- Michael Brandman Associates (MBA). 1991 (July). A Rangewide Assessment of the California Gnatcatcher (*Poliophtila californica*) (an Unpublished Report prepared for the Building Industry Association of Southern California).
- U.S. Fish and Wildlife Service (USFWS). 2007 (December 19). Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Poliophtila californica californica*); Final Rule. *Federal Register* 72(243): 72009–72213. Washington, D.C.: USFWS.
- . 2003 (April 24). Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Coastal California Gnatcatcher (*Poliophtila californica californica*) and Determination of Distinct Vertebrate Population Segment for the California Gnatcatcher (*Poliophtila californica*); Proposed Rule. *Federal Register* 68(79): 20227–20312. Washington, D.C.: USFWS. <https://www.fws.gov/policy/library/2003/03-9435.html>.
- . 1997a (February 28). *Coastal California Gnatcatcher (Poliophtila californica californica) Presence/Absence Survey Guidelines*. Washington, D.C.: USFWS.
- . 1997b (July 28). *Coastal California Gnatcatcher (Poliophtila californica californica) Presence/Absence Survey Protocol*. Washington, D.C.: USFWS.
- . 1993 (March 30). Endangered and Threatened Wildlife and Plants: Determination of Threatened Status for the Coastal California Gnatcatcher. *Federal Register* 58(59): 16742–16757. Washington, D.C.: USFWS.

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Project Location

WVF No. 1 Stage 3 Improvements Project



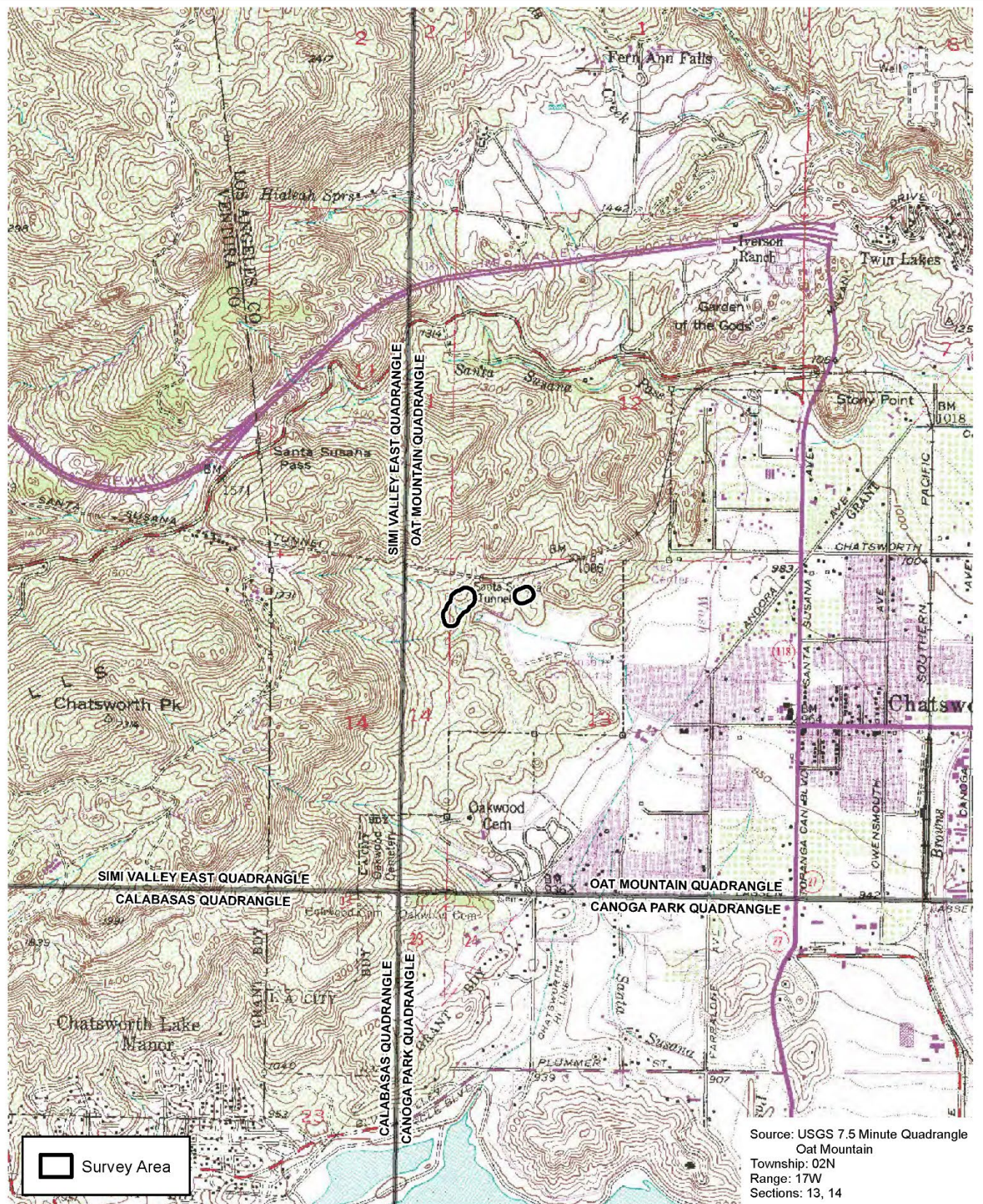
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Exhibit 1

PSOMAS

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USGS 7.5-Minute Digital Quadrangle

WVF No. 1 Stage 3 Improvements Project



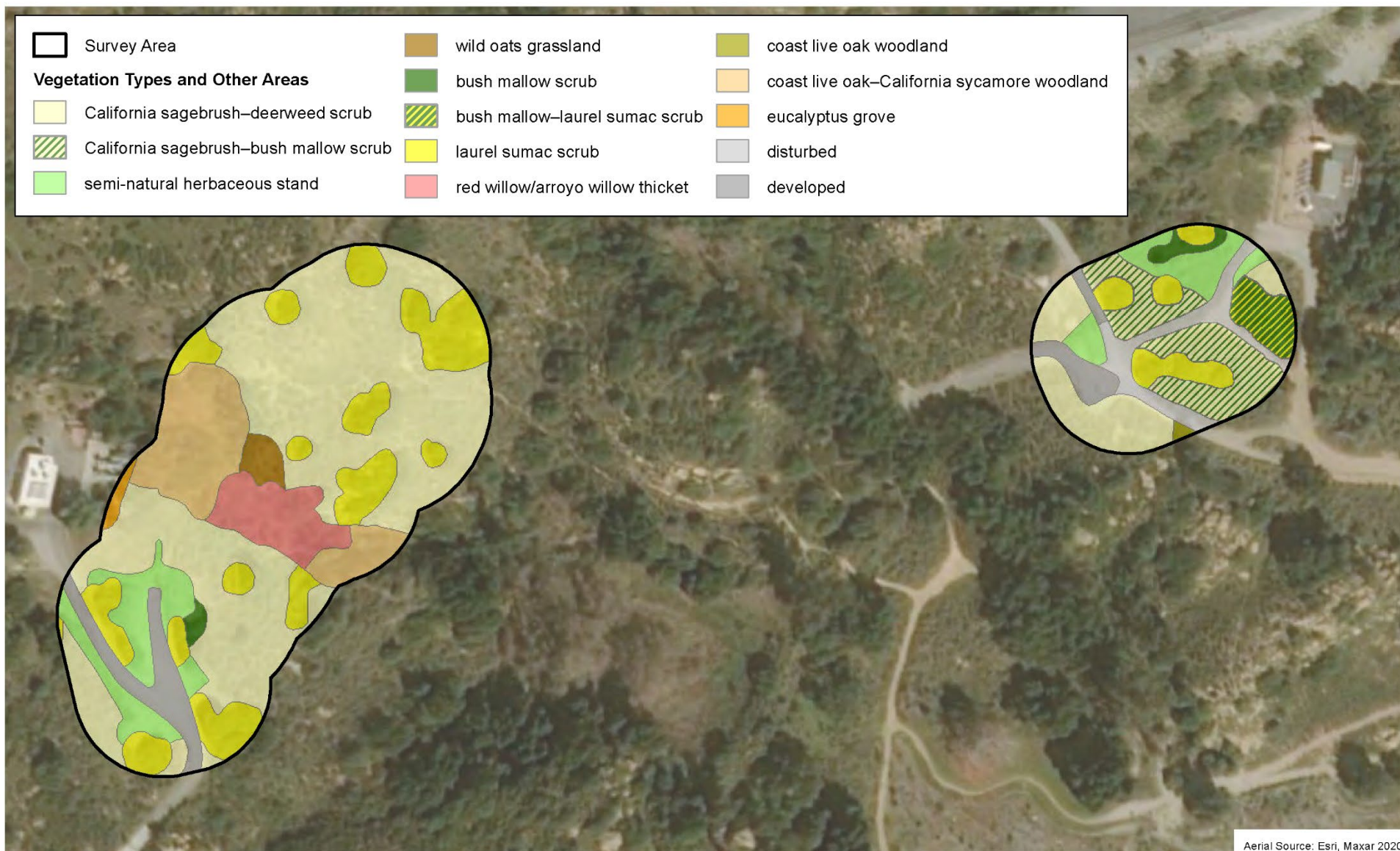
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Exhibit 2



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Biological Resources

WVF No. 1 Stage 3 Improvements Project



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Exhibit 3



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ATTACHMENT A
SITE PHOTOGRAPHS

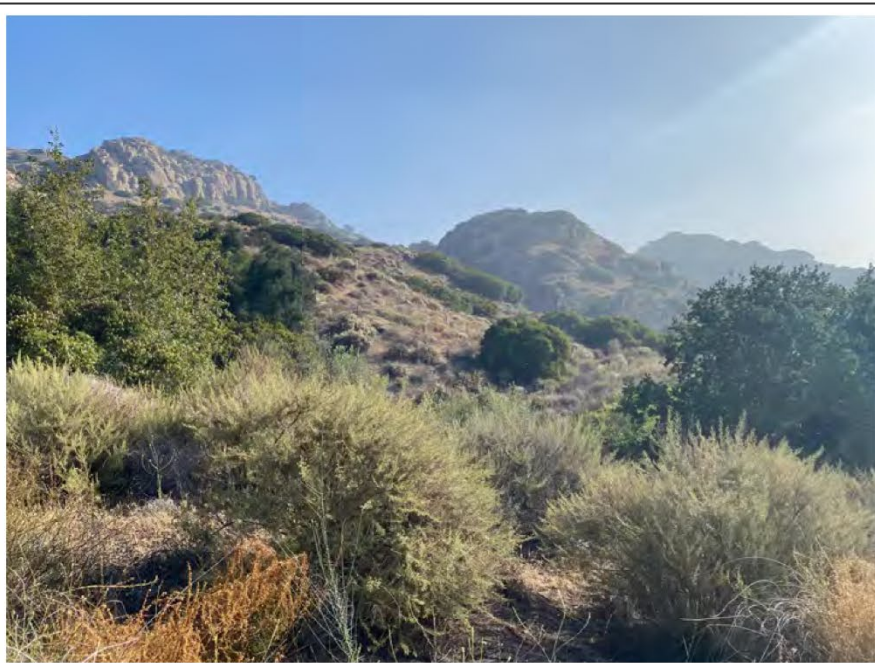


Photo 1 - June 9, 2022: View of potentially suitable habitat in the western portion of the project site, facing northeast. This area consists of California sagebrush–deerweed scrub and laurel sumac scrub dominated by laurel sumac, deerweed and California sagebrush.



Photo 2 - June 9, 2022: View of potentially suitable habitat in the middle portion of the project site, facing northwest. This area consists of California sagebrush–deerweed scrub dominated by deerweed and California sagebrush.

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Site Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-1



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Photo 3 - June 30, 2022: View of potentially suitable habitat in the southwestern portion of the project site, facing east. This area consists of California sagebrush–deerweed scrub dominated by deerweed, California buckwheat, and California sagebrush.



Photo 4 - June 30, 2022: View of potentially suitable habitat in the southeastern portion of the project site, facing west. This area consists of California sagebrush–deerweed scrub dominated by California sagebrush.

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Site Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-2



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ATTACHMENT B
WILDLIFE COMPENDIUM

WILDLIFE COMPENDIUM

Scientific Name	Common Name
LIZARDS	-
PHRYNOSOMATIDAE – SPINY LIZARD FAMILY	-
<i>Sceloporus occidentalis</i>	western fence lizard
BIRDS	-
ODONTOPHORIDAE – NEW WORLD QUAIL FAMILY	-
<i>Callipepla californica</i>	California quail
COLUMBIDAE – PIGEON AND DOVE FAMILY	-
<i>Streptopelia decaocto*</i>	Eurasian collared-dove
<i>Zenaida macroura</i>	mourning dove
APODIDAE – SWIFT FAMILY	-
<i>Aeronautes saxatalis</i>	white-throated swift
TROCHILIDAE – HUMMINGBIRD FAMILY	-
<i>Calypte anna</i>	Anna's hummingbird
<i>Selasphorus sasin</i>	Allen's hummingbird
ACCIPITRIDAE – HAWK FAMILY	-
<i>Buteo lineatus</i>	red-shouldered hawk
<i>Buteo jamaicensis</i>	red-tailed hawk
PICIDAE – WOODPECKER FAMILY	-
<i>Melanerpes formicivorus</i>	acorn woodpecker
TYRANNIDAE – TYRANT FLYCATCHER FAMILY	-
<i>Empidonax difficilis</i>	Pacific-slope flycatcher
<i>Myiarchus cinerascens</i>	ash-throated flycatcher
CORVIDAE – JAY AND CROW FAMILY	-
<i>Aphelocoma californica</i>	California scrub-jay
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	common raven
PARIDAE – TITMOUSE FAMILY	-
<i>Baeolophus inornatus</i>	oak titmouse
AEGITHALIDAE – BUSHTIT FAMILY	-
<i>Psaltirparus minimus</i>	bushtit
SITTIDAE – NUTHATCH FAMILY	-
<i>Sitta carolinensis</i>	white-breasted nuthatch
TROGLODYTIDAE – WREN FAMILY	-
<i>Thryomanes bewickii</i>	Bewick's wren
POLIOPTILIDAE – GNATCATCHER FAMILY	-
<i>Poliophtila caerulea</i>	blue-gray gnatcatcher
SYLVIIDAE – SILVIID WARBLERS FAMILY	-
<i>Chamaea fasciata</i>	wrentit
TURDIDAE – THRUSH FAMILY	-
<i>Turdus migratorius</i>	American robin
MIMIDAE – MOCKINGBIRD AND THRASHER FAMILY	-
<i>Toxostoma redivivum</i>	California thrasher
<i>Mimus polyglottos</i>	northern mockingbird

Scientific Name	Common Name
FRINGILLIDAE – FINCH FAMILY	-
<i>Haemorhous mexicanus</i>	house finch
<i>Spinus psaltria</i>	lesser goldfinch
PASSERELLIDAE – NEW WORLD SPARROW FAMILY	-
<i>Melospiza crissalis</i>	California towhee
<i>Pipilo maculatus</i>	spotted towhee
ICTERIDAE – BLACKBIRDS AND ORIOLES	-
<i>Icterus cucullatus</i>	hooded oriole
<i>Molothrus ater</i>	brown-headed cowbird
MAMMALS	-
SCIURIDAE – SQUIRREL FAMILY	-
<i>Otospermophilus beecheyi</i>	California ground squirrel
LEPORIDAE – HARE AND RABBIT FAMILY	-
<i>Sylvilagus audubonii</i>	desert cottontail

* Non-native species

October 4, 2022

Mr. Chris Kofron
Recovery Permit Coordinator
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, California 93003

VIA EMAIL
chris_kofron@fws.gov

Subject: Results of Least Bell's Vireo Focus Surveys for the Metropolitan Water District West Valley Feeder No. 1 Stage 3 Improvements Project, Los Angeles County, California

Dear Mr. Kofron:

This Letter Report presents the results of focused surveys to determine the presence or absence of the least Bell's vireo (*Vireo bellii pusillus*) for the Metropolitan Water District West Valley Feeder No. 1 Stage 3 Improvements Project (hereinafter referred to as the "proposed Project") located in Los Angeles County, California (Exhibit 1).

PROJECT DESCRIPTION AND LOCATION

The Project involves modification of the MWD WVF1 located northwest of Chatsworth Park South, in the City of Los Angeles. Proposed Project actions include construction of an approximately 500-foot access road including a vehicle turnaround area and various modifications to existing facilities including valve relocation, equipment replacement, and reconstruction of valve structures. Additionally, the project proposes the installation of new manholes, concrete vaults, and retaining walls along the WVF1. Project impacts would include both temporary impacts in areas associated with construction access, staging, and laydown areas as well as permanent impacts associated with the proposed access road. Except for those areas where impacts would be confined to existing structures and the surrounding paved areas, all other impact areas occurring would be subject to some degree of earth disturbance.

The Project site is in the western portion of the San Fernando Valley in the City of Los Angeles (Exhibit 1). Surrounding land uses include undeveloped open space in the Santa Susana Pass State Historic Park to the west and Chatsworth Park South to the east, with urban development farther to the east. The Project site occurs on the U.S. Geological Survey's (USGS') Oat Mountain 7.5-minute quadrangle at Township 2 North, Range 17 West, Sections 13 and 14 (Exhibit 2). Topography in the survey area includes slopes and eastward-draining canyons; elevations range from approximately 1,010 feet above mean sea level (msl) in the east to 1,160 feet above msl in the west.

Thirteen vegetation types and other areas occur on the project site (Exhibit 3). Vegetation categories include California sagebrush–deerweed scrub, California sagebrush–bush mallow scrub, semi-natural herbaceous stand, wild oats grassland, bush mallow scrub, bush mallow–laurel sumac scrub, laurel sumac scrub, red willow/arroyo willow thicket, coast live oak woodland, coast live oak–California sycamore woodland, eucalyptus grove, disturbed, and developed.

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Mr. Chris Kofron
 October 3, 2022
 Page 2

SPECIES BACKGROUND

The least Bell's vireo was formerly more common and widespread but became rare and local summer resident of Southern California's lowland riparian woodlands (Grinnell and Miller 1944; Garrett and Dunn 1981). The substantial population decline over the latter half of the twentieth century is attributable to the loss and degradation of riparian habitats and brood parasitism by the brown headed cowbird (*Molothrus ater*). As a result, the least Bell's vireo was listed by the California Department of Fish and Game (CDFG) as Endangered on October 2, 1980, and by the USFWS as Endangered on May 2, 1986 (CDFG 2011).

Bell's vireo is a Neotropical migrant that breeds in central and southwestern North America from northern Mexico to Southern California, Nevada, and Utah; east to Louisiana; and north to North Dakota, Wisconsin, and Indiana in the central United States (AOU 1998). Although not well known, the winter range of the Bell's vireo is believed to be the western coast of Central America from southern Sonora south to northwestern Nicaragua, including the cape region of Baja California, Mexico (Brown 1993). Of the four Bell's vireo subspecies, only two breed in California: the least Bell's vireo and the Arizona Bell's vireo (*V. b. arizonae*), which breeds in the Colorado River Valley (Garrett and Dunn 1981; Rosenberg et al. 1991). Though the least Bell's vireo was formerly considered a common breeder in riparian habitats throughout the Central Valley and other low-elevation riverine systems in California and Baja California, Mexico (Franzreb 1989), presently, the least Bell's vireo has been eliminated from much of its historical range (Franzreb 1989; Brown 1993).

The breeding habitat of the least Bell's vireo is primarily riparian dominated by willows with dense understory vegetation; shrubs such as mule fat (*Baccharis salicifolia*) and California rose (*Rosa californica*) are often a component of the understory (Goldwasser 1981). The least Bell's vireo is often found in areas that include trees such as willow (*Salix* sp.), western sycamore (*Platanus racemosa*) or cottonwood (*Populus* sp.), particularly where the canopy is within or immediately adjacent to an understory layer of vegetation (Salata 1983). The least Bell's vireo generally nests in early successional stages of riparian habitats, with nest sites frequently located in willows that are between four and ten feet high (Franzreb 1989). The most critical factor in habitat structure is the presence of a dense understory shrub layer from approximately two to ten feet above ground (Goldwasser 1981; Salata 1983; Franzreb 1989).

The least Bell's vireo population has increased tenfold from 291 territories in the early 1980s to an estimated 2,968 territories 20 years later (USFWS 2006). After a decade or more of absence in Los Angeles County, the least Bell's vireo returned by the mid-1980s with a pair reported from Whittier Narrows in 1985 and 1986 (Long 1993). Numbers of least Bell's vireo have continued to increase since that time, and it is now known to occur at several other locations in Los Angeles County such as the San Fernando (Van Norman) Dam; the San Gabriel River at Fish Canyon and Van Tassel Canyon; the Sepulveda Basin Wildlife Area; and the Castaic Lagoon Recreation Area (CDFW 2022). The two largest populations in the county are at Hansen Dam in the northeastern corner of the San Fernando Valley where 44 least Bell's vireo territories were present in 2009 (Griffith Wildlife Biology 2009) and on the Santa Clara River from I-5 downstream to the Las Brisas Bridge where 56 least Bell's vireo territories were present in 2007 (Bloom Biological, Inc. 2007).

Mr. Chris Kofron
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Page 3

On February 2, 1994, the USFWS issued their final designation of Critical Habitat for the least Bell's vireo (USFWS 1994), identifying approximately 37,560 acres as Critical Habitat in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego counties. The survey area is not located in the designated Critical Habitat area for this species.

SURVEY METHODS

A total of eight surveys for the least Bell's vireo were conducted on April 22; May 4, 16; June 6, 17, 28; and July 8, 18, 2022. Updated guidelines for least Bell's vireo surveys were issued on April 8, 1999, and require that at least eight surveys be conducted from April 10 to July 31 with a ten-day interval between each site visit. All surveys followed the recommended USFWS guidelines and were conducted by Psomas Biologist Sarah Thomas. The riparian habitat (approximately 0.21-acre) was systematically surveyed by walking slowly and methodically wherever feasible depending on streambed bank slope (Exhibits 3 and 4). Any observations of least Bell's vireo, including any pertinent behavior, would have been recorded and their locations mapped in the field. Surveys were conducted during the early morning hours and under optimal weather conditions for detection of birds. Survey dates, times, and weather data are shown in Table 1. Survey conditions and results were documented in field notes. An avian compendium recorded during these surveys is included in Attachment A.

TABLE 1
SUMMARY OF SURVEY DATA AND CONDITIONS FOR
LEAST BELL'S VIREO SURVEYS

Survey	Survey Date	Surveying Biologists	Start/End Time	Wind (miles/hour) Start	Wind (miles/hour) End	Tempe (°F) Start	Tempe (°F) End	Cloud Cover
1	4/22/2022	Thomas	0805/1015	1	1	62	69	95/75
2	5/4/2022	Thomas	0830/1000	1-2	1-2	68	73	50/Clear
3	5/16/2022	Thomas	0830/1030	2-3	1-2	67	75	Clear/Clear
4	6/6/2022	Thomas	0915/1100	1-2	1-2	70	76	25/10
5	6/17/2022	Thomas	0750/0930	0	0	63	63	100/100
6	6/28/2022	Thomas	0835/1040	1-2	1-2	79	90	25/Clear
7	7/8/2022	Thomas	0725/0910	0	1-2	66	71	Clear/Clear
8	7/18/2022	Thomas	0810/1000	1-2	1-2	76	82	50/25

SURVEY RESULTS

No least Bell's vireo were detected during the surveys. Brown headed cowbirds (three males, two females) were observed approximately 200 feet southwest of the survey area¹ on April 22; May 4, 16; and June 17 and 28, 2022.

¹ UTM 11S 350757.44 mE, 3792409.75 mN.

Mr. Chris Kofron
October 3, 2022
Page 4

Psomas appreciates the opportunity to assist on this project. If you have any comments or questions, please call Marc Blain at (626) 351-2000.

Sincerely,

P S O M A S



Marc T. Blain
Senior Project Manager



Sarah Thomas
Biologist

Enclosures: Exhibit 1 – Regional Location and Local Vicinity
 Exhibit 2 – USGS 7.5-Minute Digital Quadrangle
 Exhibit 3 – Vegetation Types and Other Areas
 Exhibit 4 – Survey Area
 Attachment A – Avian Compendium

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October 3, 2022
Page 5

REFERENCES

- American Ornithologists' Union (AOU). 1998. *Check-list of North American Birds*, 7th ed. Washington, D.C.: The American Ornithologists' Union
- Bloom Biological, Inc. 2007 (June). *Report on Interim Late Winter and Spring Survey of Raptors and Special-Status Bird Species on Portions of Newhall Land and Farming Company Property*. (Prepared for Newhall Land & Farming Company).
- Brown, B.T. 1993. Bell's Vireo (*Vireo bellii*). *The Birds of North America*, No. 35 (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia, PA and Washington, D.C.: The Academy of Natural Sciences and AOU (respectively).
- California Department of Fish and Game (CDFG). 2011 (January). *State & Federally Listed Endangered & Threatened Animals of California*. Sacramento, CA: CDFG, Natural Heritage Division.
- California Department of Fish and Wildlife (CDFW). 2022. California Natural Diversity Database. Records of Occurrence for the USGS Oat Mountain, Simi Valley East, Calabasas, Canoga Park 7.5-minute quadrangles. Sacramento, CA: CDFG, Natural Heritage Division.
- Franzreb, K.E. 1989. *Ecology and Conservation of the Endangered Least Bell's Vireo* (Biological Report 89[1]). Sacramento, CA: USFWS, Endangered Species Office.
- Garrett, K. and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society.
- Goldwasser, S. 1981. *Habitat Requirements of the Least Bell's Vireo* (Final Report, Job IV-38.1). Sacramento, CA: CDFG.
- Griffith Wildlife Biology. 2009. The Status of the Least Bell's Vireo and Southwestern Willow Flycatcher at Los Angeles County Drainage Area Sites in 2009 (Unpublished report prepared for U.S. Army Corps of Engineers, Los Angeles District Operations Branch).
- Grinnell, J. and A.H. Miller. 1944. The Distribution of the Birds of California. *Pacific Coast Avifauna No.27*. Albuquerque, NM: Cooper Ornithological Society.
- Long, M.C. 1993. *Birds of the Whittier Narrows Recreation Area; Los Angeles County, California*. South El Monte, CA: Whittier Narrows Nature Center Associates.
- Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. *Birds of the Lower Colorado River Valley*. Tucson, AZ: University of Arizona Press.
- Salata, L.R. 1983. *Status of the Least Bell's Vireo on Camp Pendleton, California: Report on Research Done in 1983*. Laguna Niguel, CA: USFWS.
- . 2006 (September). *Least Bell's Vireo (Vireo bellii pusillus): 5-Year Review, Summary and Evaluation*. Carlsbad, CA: U.S. Fish and Wildlife Service.

Mr. Chris Kofron
October 3, 2022
Page 6

———. 1994 (February 2). Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Least Bell's Vireo. *Federal Register* 59 (22): 4845–4867. Washington, D.C.: USFWS.

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Project Location

WVF No. 1 Stage 3 Improvements Project

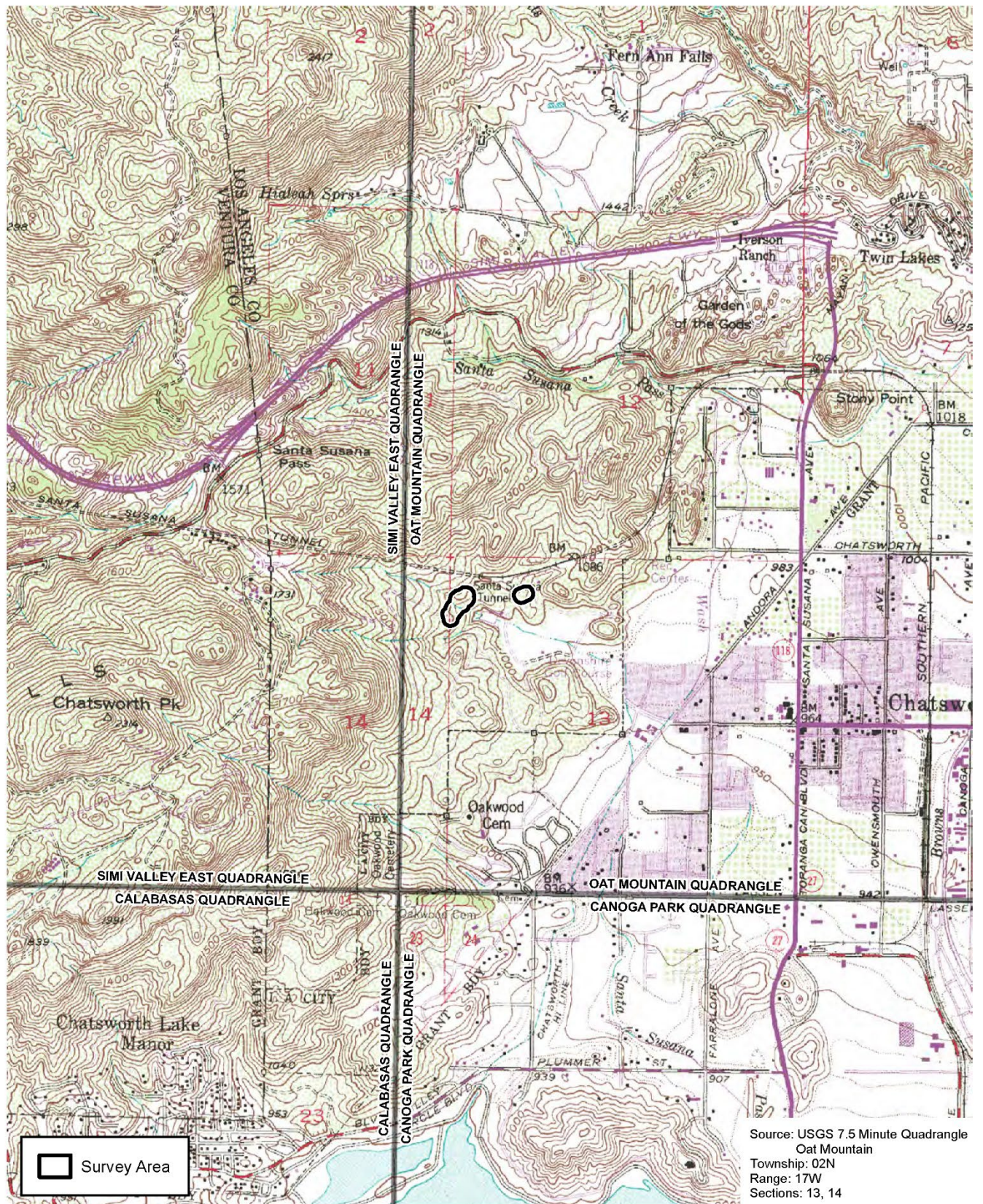


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Exhibit 1



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USGS 7.5-Minute Digital Quadrangle

WVF No. 1 Stage 3 Improvements Project

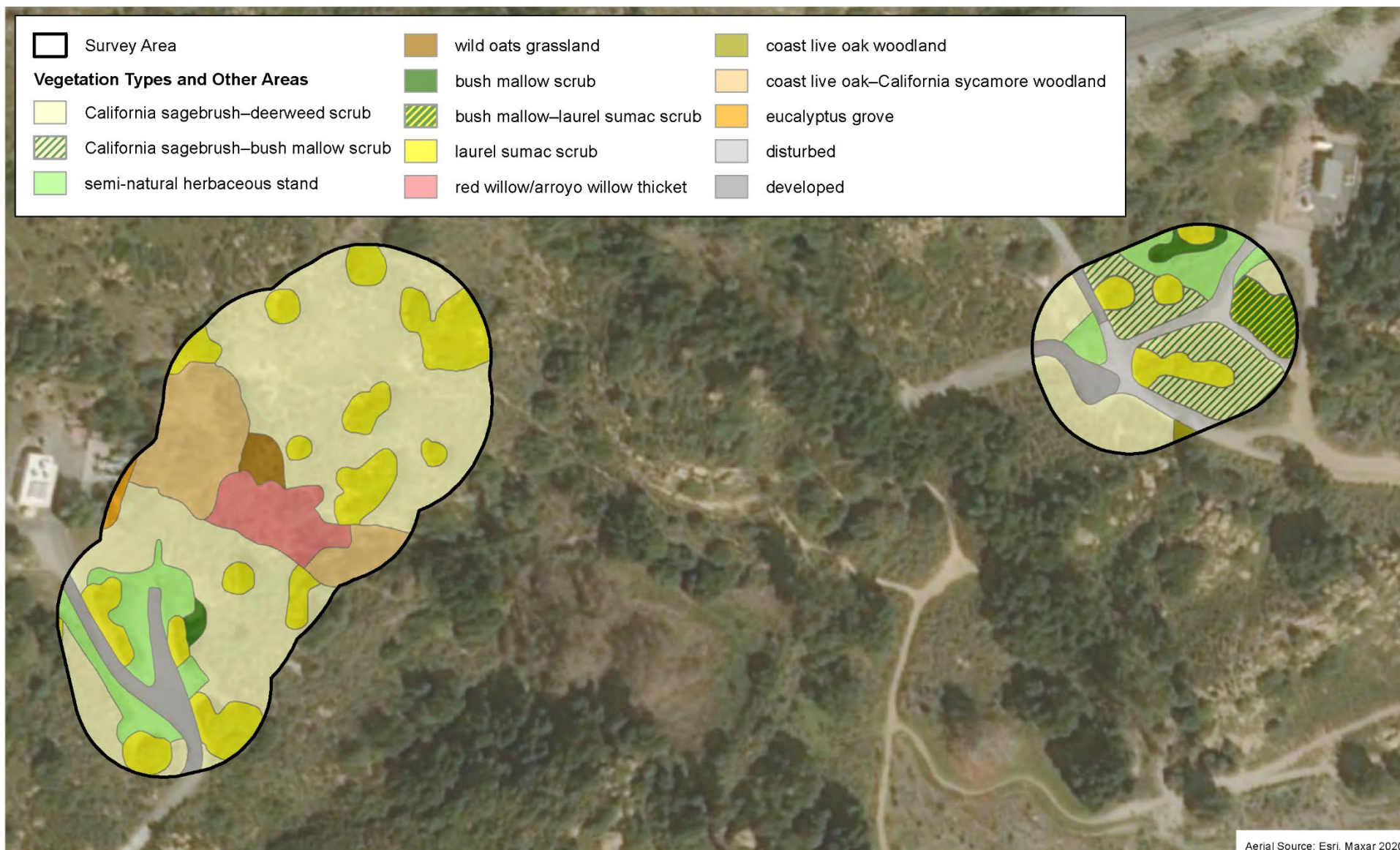


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Exhibit 2



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Vegetation Map and Other Areas

WVF No. 1 Stage 3 Improvements Project



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Exhibit 3



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Survey Area

WVF No. 1 Stage 3 Improvements Project



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Feet

Exhibit 4



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ATTACHMENT A
AVIAN COMPENDIUM

AVIAN COMPENDIUM RECORDED DURING THESE SURVEYS

Scientific Name	Common Name
BIRDS	-
ODONTOPHORIDAE – NEW WORLD QUAIL FAMILY	-
<i>Callipepla californica</i>	California quail
COLUMBIDAE – PIGEON AND DOVE FAMILY	-
<i>Streptopelia decaocto</i> *	Eurasian collared-dove
<i>Zenaida macroura</i>	mourning dove
APODIDAE – SWIFT FAMILY	-
<i>Aeronautes saxatalis</i>	white-throated swift
TROCHILIDAE – HUMMINGBIRD FAMILY	-
<i>Calypte anna</i>	Anna's hummingbird
<i>Selasphorus sasin</i>	Allen's hummingbird
CATHARTIDAE – NEW WORLD VULTURE FAMILY	-
<i>Cathartes aura</i>	turkey vulture
ACCIPITRIDAE – HAWK FAMILY	-
<i>Buteo jamaicensis</i>	red-tailed hawk
PICIDAE – WOODPECKER FAMILY	-
<i>Melanerpes formicivorus</i>	acorn woodpecker
<i>Picoides nuttallii</i>	Nuttall's woodpecker
<i>Colaptes auratus</i>	northern flicker
TYRANNIDAE – TYRANT FLYCATCHER FAMILY	-
<i>Empidonax difficilis</i>	Pacific-slope flycatcher
<i>Sayornis nigricans</i>	black phoebe
<i>Myiarchus cinerascens</i>	ash-throated flycatcher
<i>Tyrannus vociferans</i>	Cassin's kingbird
CORVIDAE – JAY AND CROW FAMILY	-
<i>Aphelocoma californica</i>	California scrub-jay
<i>Corvus corax</i>	common raven
HIRUNDINIDAE – SWALLOW FAMILY	-
<i>Stelgidopteryx serripennis</i>	northern rough-winged swallow
<i>Hirundo rustica</i>	barn swallow
<i>Petrochelidon pyrrhonota</i>	cliff swallow
PARIDAE – TITMOUSE FAMILY	-
<i>Baeolophus inornatus</i>	oak titmouse
AEGITHALIDAE – BUSHTIT FAMILY	-
<i>Psaltirparus minimus</i>	Bushtit
TROGLODYTIDAE – WREN FAMILY	-
<i>Troglodytes aedon</i>	house wren
<i>Thryomanes bewickii</i>	Bewick's wren
POLIOPTILIDAE – GNATCATCHER FAMILY	-
<i>Poliophtila caerulea</i>	blue-gray gnatcatcher
SYLVIIDAE – SILVIID WARBLERS FAMILY	-
<i>Chamaea fasciata</i>	Wrentit

Scientific Name	Common Name
MIMIDAE – MOCKINGBIRD AND THRASHER FAMILY	-
<i>Toxostoma redivivum</i>	California thrasher
<i>Mimus polyglottos</i>	northern mockingbird
STURNIDAE – STARLING FAMILY	-
<i>Sturnus vulgaris</i> *	European starling*
PTILOGONATIDAE – SILKY-FLYCATCHER FAMILY	-
<i>Phainopepla nitens</i>	Phainopepla
FRINGILLIDAE – FINCH FAMILY	-
<i>Haemorhous mexicanus</i>	house finch
<i>Spinus psaltria</i>	lesser goldfinch
PASSERELLIDAE – NEW WORLD SPARROW FAMILY	-
<i>Junco hyemalis</i>	dark-eyed junco
<i>Melospiza melodia</i>	song sparrow
<i>Melospiza crissalis</i>	California towhee
<i>Pipilo maculatus</i>	spotted towhee
ICTERIDAE – BLACKBIRDS AND ORIOLES	-
<i>Icterus cucullatus</i>	hooded oriole
<i>Molothrus ater</i>	brown-headed cowbird

* Non-native species

October 25, 2022

Lilia Martinez
Environmental Specialist, Environmental Planning Section
The Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, California 90012

VIA EMAIL
LiMartinez@mwdh2o.com

Subject: Results of 2022 Focused Surveys for the California red-legged frog (*Rana draytonii*) for the Metropolitan Water District of Southern California, West Valley Feeder No 1 Project, Los Angeles, California.

Dear Ms. Martinez:

This Letter Report presents the results of focused diurnal and nocturnal surveys to determine the presence or absence of the California red-legged frog (*Rana draytonii*), for the Metropolitan Water District (MWD) of Southern California, West Valley Feeder No 1 (WVF1) Project (hereinafter referred to as the “proposed project”) located in Los Angeles County, California (Exhibit 1). A qualified Biologist with the necessary experience and a California Department of Fish and Wildlife (CDFW) scientific collection permit conducted the surveys.

PROJECT DESCRIPTION AND LOCATION

The project involves modification of the MWD WVF1 located approximately 1,500 feet northwest of Chatsworth Park South, in the City of Los Angeles. Proposed project actions include construction of an approximately 500-foot access road including a vehicle turnaround area and various modifications to existing facilities including valve relocation, equipment replacement, and reconstruction of valve structures. Additionally, the project proposes the installation of new manholes, concrete vaults, and retaining walls along the WVF1. Project impacts would include both temporary impacts in areas associated with construction access, staging, and laydown areas as well as permanent impacts associated with the proposed access road. Except for those areas where impacts would be confined to existing structures and the surrounding paved areas, all other impact areas occurring would be subject to some degree of earth disturbance.

The project site is in the western portion of the San Fernando Valley in the City of Los Angeles (Exhibit 1). Surrounding land uses include undeveloped open space in the Santa Susana Pass State Historic Park to the west and Chatsworth Park South to the east, with urban development farther to the east. A Metrolink railroad alignment is located immediately north of the site. The project site occurs on the U.S. Geological Survey’s (USGS’) Oat Mountain 7.5-minute quadrangle at Township 2 North, Range 17 West, Sections 13 and 14 (Exhibit 2). Topography in the survey area includes slopes and eastward-draining canyons; elevations range from approximately 1,010 feet above mean sea level (msl) in the east to 1,160 feet above msl in the west.

Representative site photos are included in Attachment A.

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SPECIES BACKGROUND

California Red-legged Frog

The California red-legged is federally Endangered species and a California Species of Special Concern. This frog has been extirpated from approximately 70 percent of its historic range (USFWS 2006a). At the time of listing, the red-legged frog (*Rana aurora*) comprised two subspecies, the California red-legged frog (*R. aurora draytonii*) and the northern red-legged frog (*R. aurora aurora*) until genetic studies (Shaffer et al. 2004) determined that *R. aurora* is actually two separate species, northern red-legged frog (*R. aurora*) and California red-legged frog (*R. draytonii*). The ranges of these two species overlap in Mendocino County. Only the California red-legged frog (*R. draytonii*) occurs within the project region.

The California red-legged frog ranges in size from 1.5 to 5.5 inches in length, making it the largest native frog in the western United States (Wright and Wright 1949). Adult females are significantly longer than males, with an average snout to vent length of 5.4 inches versus 4.5 inches for adult males (Hayes and Miyamoto 1984). The hind legs and lower abdomen of adult frogs are often characterized by a reddish or salmon pink color; and the back is brown, gray, olive, or reddish brown, marked with small black flecks and larger irregular dark blotches (USFWS 2002a; Stebbins 2018). Dorsal spots often have light centers and, in some individuals, form a network of black lines (Stebbins 2018). Dorsolateral folds are prominent. Tadpoles range in length from 0.6 to 3.2 inches, and are a dark brown or olive, marked with darker spots (Storer 1925).

This species is found in humid forests, woodlands, grasslands, streams, wetlands, ponds, and lakes from sea level to 8,000 feet msl (Stebbins 2018). Preferred breeding habitat includes deep ponds and slow-moving streams where emergent vegetation is found on the bank edges (Jennings and Hayes 1994a, Thomson et al. 2016). Although primarily aquatic, it has been recorded in damp terrestrial places up to 302 feet from water for up to 50 consecutive days (Tatarian 2008) using small mammal burrows and moist leaf litter as refugia during dry periods (Jennings and Hayes 1994b).

California red-legged frog adults tend to be primarily nocturnal, while juveniles can be active at any time of day (Hayes and Tennant 1985). Adults feed on a wide range of prey, having been recorded feeding on at least 42 different taxa in a single study (Hayes and Tennant 1985), the majority of which were terrestrial invertebrates but also included fish, other amphibians, and small rodents. The diet of red-legged frog tadpoles has not been studied but is expected to be similar to other ranid frogs that feed on algae, diatoms, and detritus by grazing the surface of rocks and vegetation (Kupferberg 1997).

During the breeding season, typically from November through April, males call to females from the margins of ponds and slow streams (Jennings and Hayes 1994a). Unlike northern red-legged frogs, which lack vocal sacs and call underwater, California red-legged frogs have paired vocal sacs and call above the water surface (Hayes and Krempels 1986), though vocalizations are relatively weak and difficult to detect. Actual mating most commonly occurs in March but can vary depending on seasonal climatic patterns. The female lays a jellylike mass of 2,000 to 5,000 reddish brown eggs attached to emergent vegetation, twigs, or other structures in still or slow-moving water. The resulting tadpoles typically require about 3 weeks to hatch and another 11 to 20 weeks to metamorphose into juvenile frogs. Metamorphosis typically occurs from July to September, although some tadpoles have been observed to delay metamorphosis until the following March or April (Bobzien et al. 2000; Fellers et al. 2001). Red-legged frogs typically reach sexual maturity approximately two years (for males) and three years (for females) from metamorphosis (Jennings and Hayes 1985).

On March 17, 2010, the USFWS published the Revised Critical Habitat for the California red-legged frog. The Revised Critical Habitat designated 1,636,609 acres of critical habitat for the arroyo toad in

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27 counties in California; Southern California counties include Santa Barbara, Ventura, Los Angeles, and Riverside. The survey area is not located within designated or proposed Critical Habitat for this species.

The California red-legged frog occurred historically in The Santa Monica Mountains and the greater Los Angeles area in general. But since the early 1970s, this species had not been seen and in fact, this species was considered largely extirpated from these areas. In the early 2000's a population of California red-legged frog was found in Simi Hills and gave hope to a potential recovery effort. In 2014 that recovery effort was put into motion. The Santa Monica Mountains Conservancy, partnered with the National Parks Service, transferred approximately 950 eggs from the Simi Hills population to two undisclosed streams in the Santa Monica Mountains (Kuykendall 2014). In 2017 during a stream survey, researchers found 9 egg masses in the streams where the transplanted eggs were introduced in 2014 (Behrens 2017). More recently, night surveys of these reintroduction sites conducted post Woolsey fire resulted in a total of 28 adult California red-legged frog detections (Kuykendall 2014, Cholo 2019). These findings show evidence of a potentially successful reestablishment of California red-legged frogs in the Santa Monica Mountains.

SURVEY METHODS

Surveys were completed in accordance with the Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog released in August 2005 (CDFW 2005). The protocol for California red-legged frog recommends a total of up to eight surveys conducted between January and September, with two daytime surveys and four nighttime surveys conducted during the breeding season, and one daytime and one nighttime survey conducted during the non-breeding season. Each survey must be conducted at least seven days apart, and the entire survey must be at least six weeks long. One survey should be conducted between February 25 and April 30, and at least one survey must be conducted between July 1 and September 30.

Psomas Senior Biologists Marc Blain, with the aid of Psomas Biologist Jack Underwood conducted the focused surveys in all potentially suitable habitat for California red-legged frog in the survey area. Consecutive diurnal and nocturnal surveys were conducted on April 28, June 17, and August 30, 2022, with two standalone nocturnal surveys being conducted on May 19, and June 24, 2022. Regarding the California red-legged frog protocol, the two day and four-night surveys conducted from April through June constituted the breeding season surveys; while the day and night survey on August 30, 2022, constituted the California red-legged frog non-breeding season survey.

The surveys included diurnal and nocturnal searches to determine the presence of eggs, tadpoles, and adults. Diurnal surveys were conducted from approximately 4:30 PM until dusk, and nocturnal surveys were conducted from one hour after dusk until approximately 10:00 PM. Surveys focused on detecting frogs by visual identification, listening for the advertising call of adult males, and checking potentially suitable breeding habitat for tadpoles and/or eggs. Biologists scanned pools for eggs, larvae, metamorphs, juveniles, and breeding and/or calling adults in potentially suitable breeding locations along the creek and for foraging individuals in the adjacent riparian and upland areas. Headlamps, flashlights, and binoculars were used to visually identify toads, frogs, and their larvae detected at night. Nocturnal surveys were conducted during appropriate environmental conditions conducive to the activity patterns of the California red-legged frog. Generally, these conditions are nighttime temperatures greater than 50 degrees Fahrenheit (°F) at dusk, with low winds (less than 10 miles per hour); nights with a full or nearly full moon were avoided. If any special status amphibians were found, the individual or population was documented, recorded with a Global Positioning System (GPS) unit, and mapped on an aerial photograph. Surveyor qualifications are presented in Attachment B of this Letter Report. California red-legged frog survey data sheets are provided in Attachment C. Survey dates, times, and weather data are shown in Table 1.

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TABLE 1
SUMMARY OF SURVEY DATA AND CONDITIONS FOR CRLF SURVEYS

Survey	Survey Date	Survey Type	Surveying Biologists	Start/End Time	Wind (mph) Start	Wind (mph) End	Temp Start (°F)	Temp End (°F)	Cloud Cover (%)
1	4/28/2022	Diurnal	Blain; Underwood	6:20 PM–7:30 PM	3-4	1-2	63	60	0
2	4/28/2022	Nocturnal	Blain; Underwood	7:45 PM–9:04 PM	1-2	0-1	60	57	0
3	5/19/2022	Nocturnal	Blain	7:30 PM–9:45 PM	1-2	0–1	61	57	25
4	6/17/2022	Diurnal	Blain	4:25 PM–6:15 PM	5-6	5-6	75	73	50
5	6/17/2022	Nocturnal	Blain	7:25 PM–10:15 PM	4	3	66	63	0
6	6/24/2022	Nocturnal	Blain	8:00 PM–10:20 PM	2–3	1–2	83	74	0
7	8/30/2022	Diurnal	Blain	5:20 PM–6:40 PM	4-5	3–4	95	90	0
8	8/30/2022	Nocturnal	Blain	8:10 PM–9:40 PM	3	2	85	81	0

°F: degrees Fahrenheit; mph: miles per hour; %: percent

SURVEY RESULTS

No California red-legged frogs were detected during the surveys. No special status species were observed during any of the surveys.

One amphibian species was detected during surveys, the northern pacific tree frog (*Pseudacris regilla*). A complete list of all wildlife species detected during the surveys is provided in Attachment D.

Psomas appreciates the opportunity to assist on this project. If you have any comments or questions, please call Marc Blain at (626) 351-2000.

Sincerely,

P S O M A S



Jennifer Y. Marks
Senior Project Manager



Marc T. Blain
Senior Biologist

Enclosures: Exhibits 1–2
Attachment A – Site Photographs
Attachment B – Surveyor Qualifications
Attachment C – California Red-Legged Frog Survey Data Sheets
Attachment D – Wildlife Compendium

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REFERENCES

- Behrens, Z. (2017, March 22). *Rare Species Discovered Breeding in Santa Monica Mountains*—Santa Monica Mountains National Recreation Area (U.S. National Park Service).
<https://www.nps.gov/samo/learn/news/rare-species-discovered-breeding-in-santa-monica-mountains.htm>
- Bobzien, S., J.E. DiDonato, P.J. Alexander. 2000. *Status of the California Red-Legged Frog in the East Bay Regional Park District, California*. Oakland, California.
- California Department of Fish and Wildlife (CDFW). 2022. California Natural Diversity Database. Records of occurrence for the USGS Simi, Calabasas, Canoga Park, and Oat Mountain California 7.5-minute quadrangles. Sacramento, CA: CDFW, Natural Heritage Division.
- . 2022 (July). *Special Animals List*. Sacramento, CA: CDFW.
- . 2005 (August). *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog*. Sacramento, CA: CDFW.
- Cholo, A. (2019, October 15). *Night Surveys Show a Small Number of Threatened California Red-Legged Frogs Were Able to 'Tough Out' the Woolsey Fire and Subsequent Mudslides*—Santa Monica Mountains National Recreation Area (U.S. National Park Service).
<https://www.nps.gov/samo/learn/news/night-surveys-show-a-small-number-of-threatened-california-red-legged-frogs-were-able-to-tough-out-the-woolsey-fire-and-subsequent-mudslides.htm>
- Fellers G.M., D.E. Green, and J.E. Longcore. 2001. Oral chytridiomycosis in the Mountain Yellow-legged Frog (*Rana muscosa*). *Copeia* 2001:945-953.
- Hayes, M.P. and D.M. Kremples. 1986. Vocal sac variation among frogs of the genus *Rana* (*Anura*: *Ranidae*) from western North America. *Copeia* 1986:927-936.
- Hayes, M.P., and M.M. Miyamoto. 1984. "Biochemical, behavioral and body size difference between *Rana aurora aurora* and *R. a. draytonii*." *Copeia*, 1984(4), 1018-1022.
- Hayes, M.P., and M.R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog, *Rana aurora draytonii* (*Ranidae*). *Southwestern Naturalist* 30(4): 601-605.
- Jennings, M.R., and M.P. Hayes. 1994a. *Amphibian and Reptile Species of Special Concern in California* (Contract No. 8023). Sacramento, CA: CDFG, Inland Fisheries Division.
- . 1994(b). Decline of native ranid frogs in the desert Southwest. Pages 183-211 in P.R. Brown and J.W. Wright (editors). *Herpetology of the North American deserts: Proceedings of a symposium*. Southwestern Herpetologists Society Special Publication No. 5.
- . 1985. Pre-1900 overharvest of the California red-legged frog (*Rana aurora draytonii*): the inducement for bullfrog (*Rana catesbeiana*) introduction. *Herpetologica* 41:94–103.
- Kupferberg, S.J. 1997. The role of larval diet in anuran metamorphosis. *American Zoologist* 37:146–159.

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- Kuykendall, K. (2014, July 25). *Biologists Release Hundreds of Threatened Frogs in Santa Monica Mountains Streams*—Santa Monica Mountains National Recreation Area (U.S. National Park Service). <https://www.nps.gov/samo/learn/news/biologists-release-100s-of-frogs.htm>
- Shaffer, H.B., G.M. Fellers, S.R. Voss, J.C. Oliver, and G.B. Pauly. 2004. Species boundaries, phylogeography and conservation genetics of the red-legged frog (*Rana aurora/draytonii*) complex. *Molecular Ecology* 13:2667–2677. Boston, MA: Blackwell Publishing Ltd.
- Stebbins, Robert C. 2018. *A Field Guide to Western Reptiles and Amphibians*. 4th Edition. Houghton Mifflin Company.
- Storer, T. I. 1925. “A synopsis of the amphibia of California.” *University of California Publications in Zoology*, 27, 1-342.
- Tatarian, P.J. 2008. Movement patterns of California red-legged frogs (*Rana draytonii*) in an inland California environment. *Herpetological Conservation and Biology* 3:155-169.
- Thomson, R. C., Wright, A. N., Shaffer, H. B., Bolster, B., Cripe, K., Barry, S. J., Fisher, R. N., & Welsh, H. H. (2016). *California Amphibian and Reptile Species of Special Concern* (1st ed.). University of California Press. <http://www.jstor.org/stable/10.1525/j.ctv1xxxbx>
- U.S. Fish and Wildlife Service (USFWS). 2008. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the California Red-Legged Frog (*Rana aurora draytonii*). *Federal Register* 73(180): 53491–53680.
- . 2006a. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California Red-legged Frog, and Special Rule Exemption Associated with Final Listing for Existing Routine Ranching Activities; Final Rule. *Federal Register* 71(71): 19243–19346. Washington, D.C.: USFWS.
- . 2005b (August). Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog. 26 pp.
- . 2002a. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon.
- . 2000. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for the California Red-Legged Frog (*Rana aurora draytonii*); Proposed Rule. *Federal Register* 65 (176): 54891-54932.
- Wright, A. H. and Wright, A. A. 1949. *Handbook of Frogs and Toads of the United States and Canada*. Comstock Publishing Company, Inc., Ithaca, New York.

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Project Location

WVF No. 1 Stage 3 Improvements Project

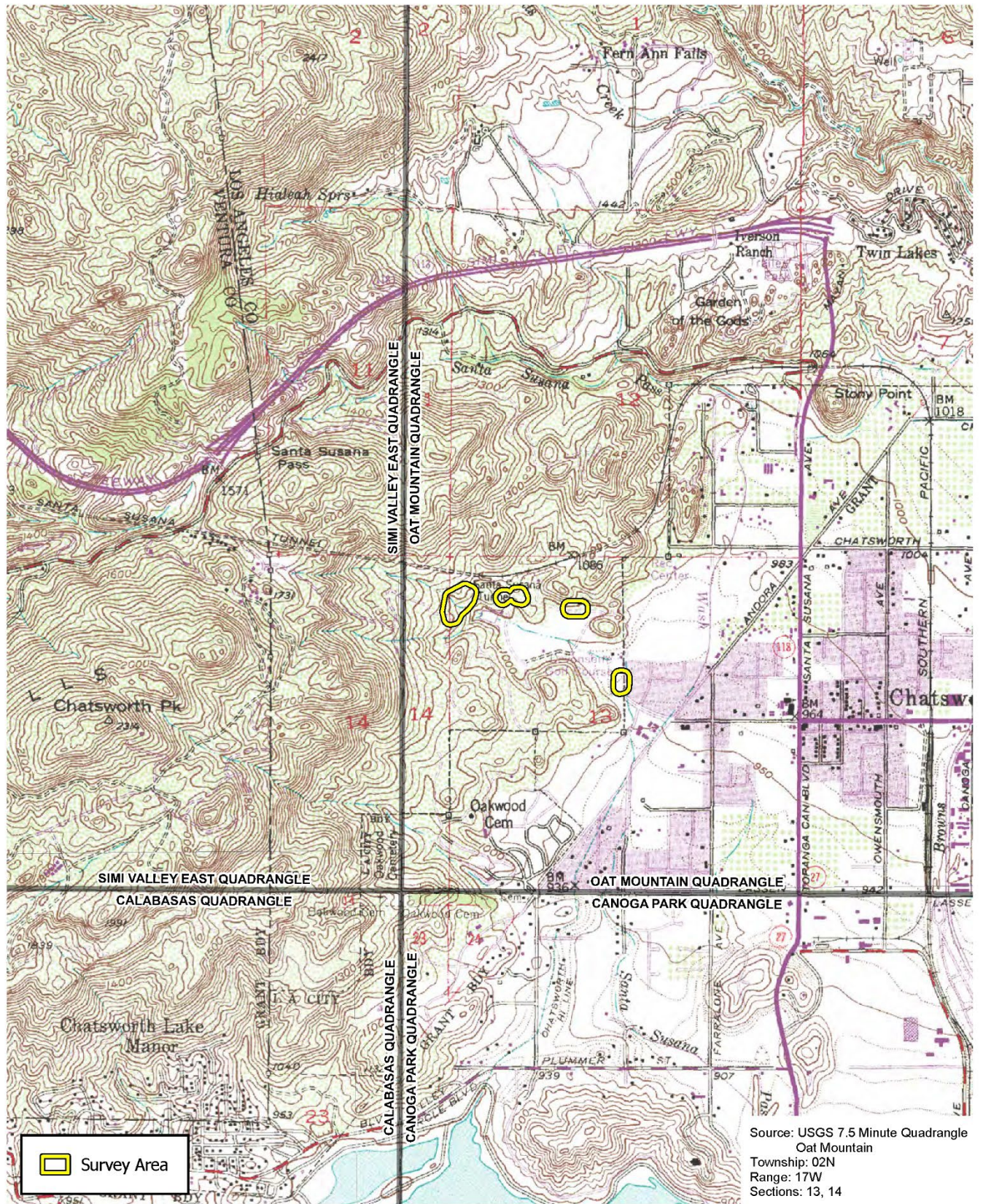


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Exhibit 1



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USGS 7.5-Minute Digital Quadrangle

Exhibit 2

WVF No. 1 Stage 3 Improvements Project



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PSOMAS

ATTACHMENT A
SITE PHOTOGRAPHS



California sagebrush–deerweed scrub in the western portion of the survey area.



California sagebrush–bush mallow scrub in the eastern portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A–1





Semi-natural herbaceous stand in the western portion of the survey area.



Laurel sumac scrub in the western portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-2



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Red willow/arroyo willow thicket in the western portion of the survey area.



Coast live oak-California sycamore woodland in the western portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-3





Eucalyptus grove in the western portion of the survey area.



Disturbed area in eastern portion of the survey area.

Representative Photographs

WVF No. 1 Stage 3 Improvements Project

Attachment A-4





WWF1 STA 1416+33 existing blowoff (to be abandoned).



WWF1 STA 1407+45 existing blowoff.

Representative Photographs

WWF No. 1 Stage 3 Improvements Project

Attachment A-5





Along existing access trail to WWF1 STA 1415+42 proposed vault and pump well.



Contractor's laydown area in the western portion of the survey area.

Representative Photographs

WWF No. 1 Stage 3 Improvements Project

Attachment A-6



ATTACHMENT B
SURVEYOR QUALICATIONS

ATTACHMENT C

CALIFORNIA RED-LEGGED FROG SURVEY DATA SHEETS

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____

(FWS Field Office)

(date)

(biologist)

Date of Survey: 04/28/2022
(mm/dd/yyyy)

Survey Biologist: Blain, Marc
(Last name) (first name)

Survey Biologist: Underwood, Jack
(Last name) (first name)

Site Location: LA County; Chatsworth; 34°15'42.3"N 118°37'21.2"W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

map within report

Proposed project name: MWD West Valley Feeder (WVF)

Brief description of proposed action:

Roadway access improvements & additions for WVF stub out point.

Type of Survey (circle one): DAY NIGHT

BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 6:20 PM

End Time: 7:30 PM

Cloud cover: 0%

Precipitation: 0/

Air Temperature: 63° F

Water Temperature: 66° F

Wind Speed: 2-3 MPH

Visibility Conditions: Clear

Moon phase: Waning Crescent

Humidity: 66%

Description of weather conditions: Weather was clear with no clouds over head.

Brand name and model of light used to conduct surveys: Bercof - Rechargeable, Zoomable Tactical Flashlight. Adjustable to up to 100m range.

Were binoculars used for the surveys (circle one)?

YES NO

Brand, model, and power of binoculars: Mikon Monarch M7 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: None observed.

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

**Appendix E.
California Red-legged Frog Survey Data Sheet**

Survey results reviewed by _____ (FWS Field Office)	(date)	(biologist)
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Date of Survey: 4/28/2022
(mm/dd/yyyy)

Survey Biologist: Blain Marc
(Last name) (first name)

Survey Biologist: Underwood Jack
(Last name) (first name)

Site Location: Alameda County; Chabot; 39° 15' 42.3" N 118° 37' 21.2" W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: MWD West Valley Feeder (WVF)
Brief description of proposed action:
Roadway access improvements & additions for WVF
Stub out point.

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 7:45 PM End Time: 9:04 PM

Cloud cover: 0% Precipitation: 0%

Air Temperature: 60°F Water Temperature: 66°F

Wind Speed: 1-2 MPH Visibility Conditions: Clear

Moon phase: waning crescent Humidity: 70%

Description of weather conditions: weather was clear with no precipitation.

Brand name and model of light used to conduct surveys: Hercal - rechargeable, zoomable, tactical flashlight. Adjustable to under 100,000 candle watts.

Were binoculars used for the surveys (circle one)? YES NO

Brand, model, and power of binoculars: Nikon Monarch M7 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Northern Pacific Treefrog	N/A	H	adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: None observed

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____

(FWS Field Office)

(date)

(biologist)

Date of Survey: 05/19/2022
(mm/dd/yyyy)

Survey Biologist: Blain
(Last name)

MARC
(first name)

Survey Biologist: _____
(Last name)

(first name)

Site Location: LA County, Chatsworth, 34° 15' 42.3" N 118° 37' 21.2 W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: MWD West Valley Feeder (WVF)

Brief description of proposed action:

Roadway access improvements & additions for WVF
STUB OUT POINT.

Type of Survey (circle one): DAY NIGHT

BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 7:30 PM

End Time: 9:45 PM

Cloud cover: 25%

Precipitation: 0

Air Temperature: 61°F

Water Temperature: 66°F

Wind Speed: 1-2 MPH

Visibility Conditions: Relatively clear

Moon phase: waning gibbous

Humidity: 81%

Description of weather conditions: weather was relatively clear with
NO precipitation.

Brand name and model of light used to conduct surveys: Beacon - Rechargeable, zoomable, tactical
Flashlight, adjustable to under 100,000 candle watts.

Were binoculars used for the surveys (circle one)? YES NO

Brand, model, and power of binoculars: Nikon Monarch M7 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Northern Pacific Treefrog	1	0 3 H	adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: NONE observed

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____	(RWS Field Office)	(date)	(biologist)
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Date of Survey: 06/17/2022 Survey Biologist: Blain Marc
(mm/dd/yyyy) (Last name) (first name)
 Survey Biologist: _____
(Last name) (first name)

Site Location: LA COUNTY; Chatsworth 34° 15' 42.3" N 118° 37' 21.2" W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: <u>MWD West Valley Feeder Gully</u>
Brief description of proposed action: <u>Roadway access improvements & additions for WVF</u> <u>STUB OUT POINT.</u>

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 4:25 PM End Time: 6:15 PM

Cloud cover: 50% Precipitation: 0%

Air Temperature: 75°F Water Temperature: 66°F

Wind Speed: 5-6 MPH Visibility Conditions: clear

Moon phase: waning gibbous Humidity: 57%

Description of weather conditions: Weather conditions were relatively clear with no precipitation

Brand name and model of light used to conduct surveys: Berea - Rechargeable, Zoomable, Tactical Flashlight. Adjustable to under water or land use.

Were binoculars used for the surveys (circle one)? YES NO

Brand, model, and power of binoculars: Nikon Monarch M7 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: NONE observed

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Survey results reviewed by _____
(RWS Field Office) (date) (biologist)

Site Location: LA County; Chatsworth; 34° 15' 42.3" N 118° 37' 21.2" W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

Proposed project name: MWD West Valley Feeder (WVF)
Brief description of proposed action:
Roadway access improvements & additions for WVF
STUB OUT POINT.

Description of weather conditions: weather conditions were clear
with no precipitation

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Nikon Model 197 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Northern Pacific treefrog	N/A	H	adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

**Appendix E.
California Red-legged Frog Survey Data Sheet**

Survey results reviewed by _____	(FWS Field Office)	(date)	(biologist)
----------------------------------	--------------------	--------	-------------

Date of Survey: 06/24/2022 Survey Biologist: Blain Marc
(mm/dd/yyyy) (Last name) (first name)

Survey Biologist: _____
(Last name) (first name)

Site Location: La County; Chatsworth; 34° 15' 42.3" N 118° 37' 21.2" W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: MWD West Valley Feeder (WVF)
 Brief description of proposed action:
Roadway access improvements & additions for WVF
STUB OUT POINT.

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 8:00 PM End Time: 10:20 PM

Cloud cover: 0% Precipitation: 0%

Air Temperature: 83°F Water Temperature: 66°F

Wind Speed: 2-3 MPH Visibility Conditions: Clear

Moon phase: Waning Crescent Humidity: 84%

Description of weather conditions: weather was relatively clear with NO precipitation

Brand name and model of light used to conduct surveys: Bercol - Rechargeable, Zoomable, Tactical Flashlight. Adjustable to under 100,000 candle watts.

Were binoculars used for the surveys (circle one)? YES NO

Brand, model, and power of binoculars: Nikon Monarch M7 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Northern Pacific tree frog	1-4	O 3 H	adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 08/30/2022 Survey Biologist: Blain Marc
(mm/dd/yyyy) (Last name) (first name)
Survey Biologist: _____
(Last name) (first name)

Site Location: LA County, Chatsworth; 34° 15' 42.3" N 118° 37' 21.2" W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: MWD West Valley Feeder (WVF)
Brief description of proposed action:
Roadway access improvements & additions for WVF
STUB OUT POINTS.

Type of Survey (circle one) DAY NIGHT BREEDING NON-BREEDING
Survey number (circle one): 1 2 3 4 5 6 7 8
Begin Time: 5:20 PM End Time: 6:40 PM
Cloud cover: 0% Precipitation: 0%
Air Temperature: 95°F Water Temperature: 68°F
Wind Speed: 3-4 Visibility Conditions: clear
Moon phase: waxing crescent Humidity: 80%

Description of weather conditions: weather conditions were clear
with no precipitation

Brand name and model of light used to conduct surveys: BerGo! - Rechargeable, zoomable, tactical
Flashlight. Adjustable to under 100,000 candle watts.

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Nikon Monarch M7 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: None observed

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Site Location: LA County; Chatsworth; 34° 15' 42.3" N 118° 37' 21.2" W
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: MWD WEST Valley Food, (WVF)

Brief description of proposed action:

Readonly access improvements & additions For WVF

Type of Survey (circle one): DAY NIGHT

BREEDING (NON-BREEDING)

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 8:10 PM

End Time: 9:40 PM

Cloud cover: 0

Precipitation: 0%

Air Temperature: 85°F

Water Temperature: 66°F

Wind Speed: 2-3 MPH

Visibility Conditions: clear

Moon phase: Waxing Crescent

Humidity: 85 1/2

Description of weather conditions: weather conditions were clear with no precipitation

Brand name and model of light used to conduct surveys: Berkol-Rechargeable, 200mAh, red light
Flashlight: Adjustable 50, under 100,000 lumens, 10 watts.

Were binoculars used for the surveys (circle one)? YES NO

Brand, model, and power of binoculars: Nikon Monarch M7 8x42 8.3°

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Northern Pacific Tree Frog	3	H	adult	NA	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, etc.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

ATTACHMENT D
WILDLIFE COMPENDIUM

WILDLIFE SPECIES DETECTED DURING SURVEYS

Scientific Name	Common Name
AMPHIBIANS	
HYLIDAE – TREEFROG FAMILY	
<i>Pseudacris regilla</i>	Northern Pacific treefrog
LIZARDS	
PHRYNOSOMATIDAE – SPINY LIZARD FAMILY	
<i>Uta stansburiana</i>	common side-blotched lizard
BIRDS	
ANATIDAE – SWAN, GOOSE, AND DUCK FAMILY	
<i>Anas platyrhynchos</i>	mallard
COLUMBIDAE – PIGEON AND DOVE FAMILY	
<i>Columba livia*</i>	rock pigeon
<i>Zenaida macroura</i>	mourning dove
CAPRIMULGIDAE – NIGHTJAR FAMILY	
<i>Phalaenoptilus nuttallii</i>	common poorwill
APODIDAE – SWIFT FAMILY	
<i>Aeronautes saxatalis</i>	white-throated swift
TROCHILIDAE – HUMMINGBIRD FAMILY	
<i>Calypte anna</i>	Anna's hummingbird
ACCIPITRIDAE – HAWK FAMILY	
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo jamaicensis</i>	red-tailed hawk
STRIGIDAE – TYPICAL OWL FAMILY	
<i>Bubo virginianus</i>	great horned owl
PICIDAE – WOODPECKER FAMILY	
<i>Melanerpes formicivorus</i>	acorn woodpecker
<i>Picoides nuttallii</i>	Nuttall's woodpecker
<i>Colaptes auratus</i>	northern flicker
CORVIDAE – JAY AND CROW FAMILY	
<i>Aphelocoma californica</i>	California scrub-jay
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	common raven
HIRUNDINIDAE – SWALLOW FAMILY	
<i>Stelgidopteryx serripennis</i>	northern rough-winged swallow
PARIDAE – TITMOUSE FAMILY	
<i>Baeolophus inornatus</i>	oak titmouse
AEGITHALIDAE – BUSHTIT FAMILY	
<i>Psaltiriparus minimus</i>	bushtit
TROGLODYTIDAE – WREN FAMILY	
<i>Catherpes mexicanus</i>	canyon wren
<i>Thryomanes bewickii</i>	Bewick's wren
SYLVIIDAE – SILVIID WARBLERS FAMILY	
<i>Chamaea fasciata</i>	wrentit
TURDIDAE – THRUSH FAMILY	
<i>Sialia mexicana</i>	western bluebird

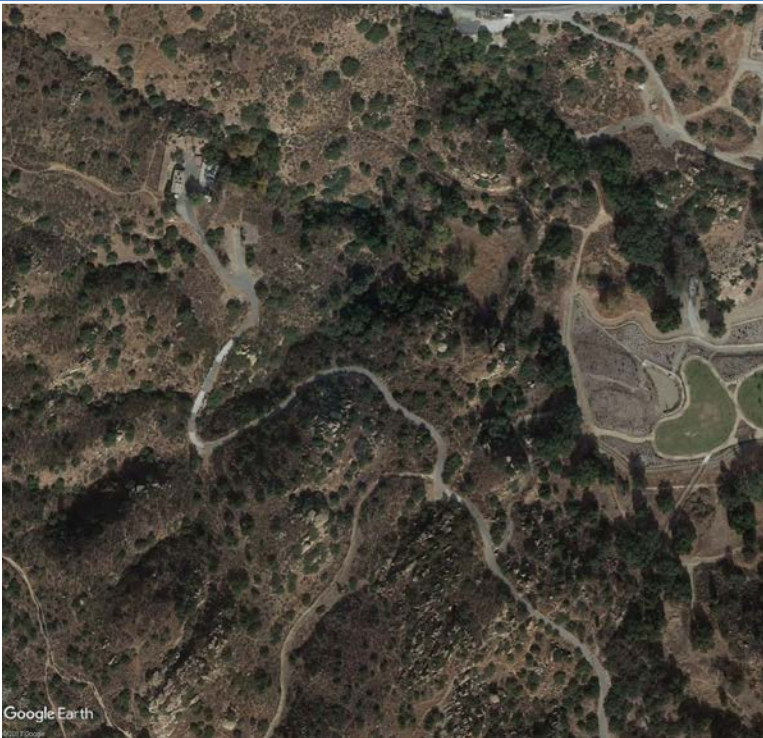
Scientific Name	Common Name
MIMIDAE – MOCKINGBIRD AND THRASHER FAMILY	
<i>Mimus polyglottos</i>	northern mockingbird
PTILOGONATIDAE – SILKY-FLYCATCHER FAMILY	
<i>Phainopepla nitens</i>	phainopepla
FRINGILLIDAE – FINCH FAMILY	
<i>Haemorhous mexicanus</i>	house finch
<i>Spinus psaltria</i>	lesser goldfinch
PASSERELLIDAE – NEW WORLD SPARROW FAMILY	
<i>Junco hyemalis</i>	dark-eyed junco
<i>Melospiza crissalis</i>	California towhee
<i>Pipilo maculatus</i>	spotted towhee
ICTERIDAE – BLACKBIRDS AND ORIOLES	
<i>Agelaius phoeniceus</i>	red-winged blackbird
PARULIDAE – WOOD-WARBLER FAMILY	
<i>Setophaga coronata</i>	yellow-rumped warbler
MAMMALS	
LEPORIDAE – HARE AND RABBIT FAMILY	
<i>Sylvilagus audubonii</i>	desert cottontail
CANIDAE – CANID FAMILY	
<i>Canis latrans</i>	Coyote

* Non-native species

APPENDIX D

ARCHAEOLOGICAL INVENTORY REPORT

ARCHAEOLOGICAL INVENTORY
Metropolitan Water District (MWD)
West Valley Feeder No 1 (WVF1) Stage 3
Improvements Project



Submitted to:

Psomas

Jennifer Marks, Senior Project Manager/Associate
Environmental Planning
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August 28, 2018

Abstract

The Metropolitan Water District of Southern California (MWD) has requested an archaeological record search and inventory for the proposed construction of an approximately 500-foot access road including a vehicle turn-around area and various modifications to existing facilities including valve relocation, equipment replacement, and reconstruction of valve structures. The archival research indicated that the project area is sensitive for archaeological resources with multiple sites in the immediate area. The foot reconnaissance was conducted and found ground visibility to be poor and could not determine if archaeological resources were present in the access road alignment. No archaeological resources were observed in the other impact areas. The proximity of recorded archaeological resources coupled with poor ground visibility warrants a recommendation for monitoring by an archaeological and Native American monitor.

Should potentially important cultural deposits be encountered during ground disturbing activities, work should be temporarily diverted from the vicinity of the discovery until the archaeologist and Native American can identify and evaluate the importance of the find, conduct any appropriate assessment, and implement measures to mitigate impacts on significant resources.

USGS Quadrangles: Oat Mountain and Santa Susana

Acreage: Various acres

Cultural Resources: None observed

Type of Investigation: Archaeological Record Search and Inventory

Cover Picture: Aerial view of subject area.

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BACKGROUND	2
LITERATURE AND ARCHIVAL REVIEW	6
SURVEY RESULTS	10
IMPACTS.....	10
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This report is not for public distribution

INTRODUCTION

Greenwood and Associates has conducted an archaeological record search and field inventory for the proposed Project for Metropolitan Water District (MWD) West Valley Feeder No. 1 (WVF1) Stage 3 Improvements Project in the community of Chatsworth in Los Angeles (Figure 1).

The study was prepared in order to identify any archaeological resources within the proposed impact areas. The investigation provides the necessary documentation to satisfy its obligations relative to CEQA requirements. The effort included a review of available archaeological site archives, historical maps, documents describing the proposed project area, and a survey of previously identified archaeological sites. This report describes the results of the background research, methods and results of the field investigation, and conclusions regarding the probability of impact to cultural resources due to project-related activities.

The Project involves modification of the MWD WVF1 structures, which is located northwest of Chatsworth Park South, in the City of Los Angeles. Proposed project actions include construction of an approximately 14-foot wide by 500-foot long access road including a vehicle turn-around area and various modifications to existing structures including valve relocation, equipment replacement, and reconstruction of valve structures. Additionally, the project proposes the installation of new manholes at existing structures, a concrete vault, and retaining walls along the WVF1. Project impacts would include both temporary impact areas associated with construction access, staging, and laydown areas as well as permanent impacts associated with the proposed access road. Except for those areas where impacts would be confined to existing structures and the surrounding, paved areas, all other impact areas occurring would be subject to some degree of earth disturbance (Figure 2).

CURRENT SETTING

The project area is on and within the east facing hills of the community of Chatsworth within the city of Los Angeles. The hills are covered in chaparral, sandstone cliffs, boulders, paved roads, lightly graded roads, and trails. MWD facilities including structures, pipelines, and other facilities are dispersed throughout the area. Las Virgenes and Calleguas Water Districts have pump stations and pipelines in Chatsworth Park. Lower portions of the park recently underwent extensive lead soil remediation.

The West Valley Feeder No. 1 was constructed in 1962 and has an inside diameter of 54 inches. Specific installation methods and exact excavation depths vary from pipeline to pipeline; however, the excavation methods and typical disturbance areas can be described. Generally pipelines have 5 to 10 feet of cover to the top of the pipe, although in some areas it may be substantially more due to topography or to avoid existing facilities. In undeveloped areas, such as the project area, trenching was generally open cut excavation

with 1:1 side slopes. Shoring is used in developed areas and along public streets. In the areas where open cut excavation is employed, the trench depths are generally between 15 and 20 foot deep and 30 to 50 foot wide at the existing ground surface, depending on topography.

BACKGROUND

Ethnography

This section summarizes the regional and cultural history of the project area. The discussion has been limited to that Native American group described as occupying the project area at the time of European contact and the historically documented activities following that contact. Chatsworth was inhabited by the Tongva-Fernandeño, Chumash-Venturaño, and Tataviam-Fernandeño Native American tribes.

Prehistory

The archaeological record indicates that sedentary populations occupied the coastal and inland regions of California more than 13,000 years ago. Early periods were characterized by the processing of hard seeds with the mano and milling stone and the use of the atlatl (dart thrower) to bring down large game, e.g., deer. Villages in eastern Ventura area were typically around permanent water sources that allowed exploitation of a variety of different habitats for food. In the later periods, prior to the arrival of Europeans, the bow and arrow was in use, trade and social networks evolved, and the mortar and pestle were used to process acorns in areas where they were available.

At the time of European contact, Chumash speaking peoples occupied a large area that extended south along the California coast from San Luis Obispo County into Los Angeles County and east to Kern County, and included the Santa Barbara Channel Islands of San Miguel, Santa Rosa, Santa Cruz, and Anacapa (Glassow 1980; Grant 1978). The project area lies within the territory occupied at that time by a native group speaking Ventureño, one of the six major dialects of the Chumash language.

Known as the Ventureño Chumash, this group was distinguished from their culturally similar neighbors to the west and north, the Ynezeño and Barbareño Chumash, on the basis of linguistic deviations noted by the early Spanish missionaries of the area, rather than by any apparent difference in social or economic organization. The Ventureño (so named because of their association with Mission San Buenaventura) were the southernmost of all the Chumash peoples and spoke one of six Chumashan dialects considered as forming a core group of more closely related forms (Grant 1978).

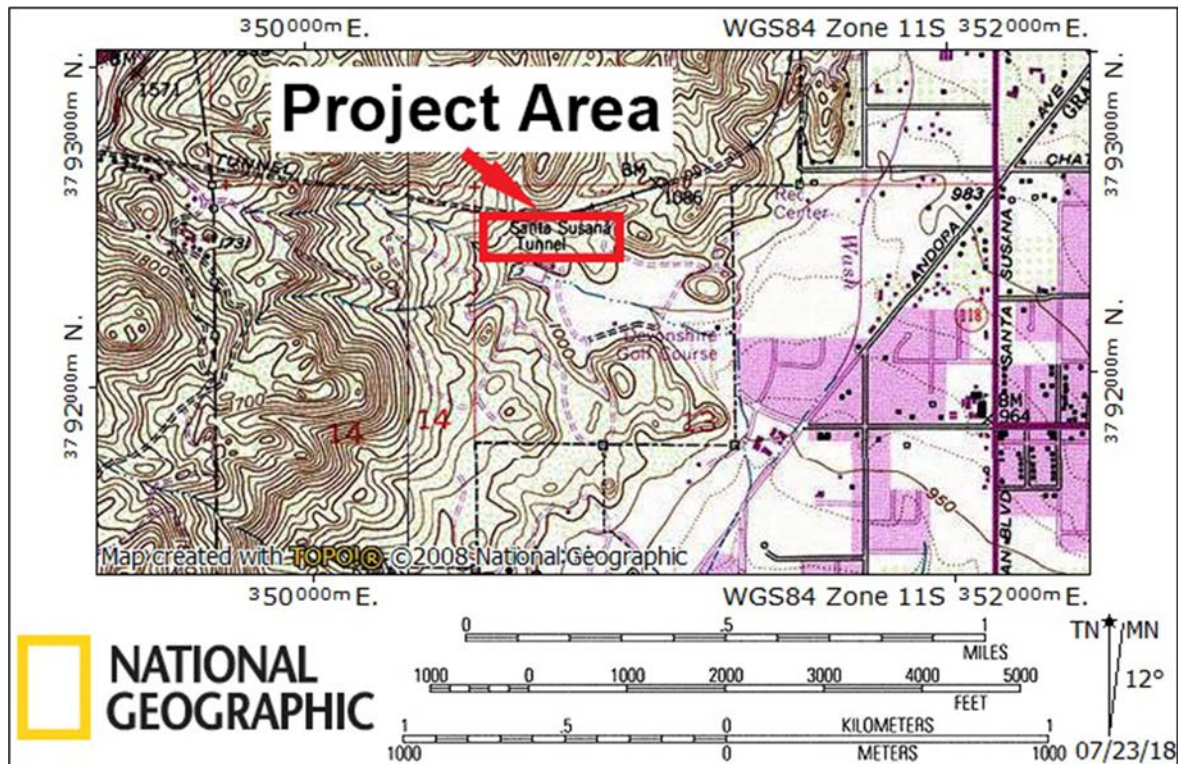


Figure 1. Vicinity Map, USGS Oat Mountain and Santa Susana, CA, 7.5 minute Quadrangles.

Native American culture in this region evolved over the course of at least 9,000 years and has been described as having achieved a level of social, political, and economic complexity not ordinarily associated with hunting and gathering groups (Greenwood and Browne 1969). Ethnographic information about the culture is most extensive for the coastal populations, and the culture and society have been well documented for groups such as the Barbareño and Ventureño Chumash. Much of what is known of the Ventureño has been provided by the journals of early Spanish explorers and by accounts of Chumash informants.

The Ventureño, like their neighbors, exploited a wide variety of marine and terrestrial resources within an ecosystem similar to that of their neighbors in Santa Barbara County. The limited area occupied by the Barbareño Chumash, a narrow coastal plain bounded on the north by the Santa Ynez Mountains, combined with a productive near shore fishery, resulted in the establishment of substantial permanent villages (Glassow and Wilcoxon 1979). These large villages provided centralized locations from which the inhabitants ventured to exploit available or seasonal resources and dispersed surplus resources and manufactured goods through intervillage exchange networks.

History

European incursions into the Ventureño area began with the arrival by sea of Juan Rodriguez Cabrillo on October 10, 1542, at the coastal Chumash village of *Shisholop*. Here, at the

present site of the City of Ventura, the Spaniards were met by “many very good canoes, each of which held 12 or 13 Indians.” This prompted the visitors to name the settlement the Pueblo de las Canoas. Cabrillo and his men remained in the area until the 13th of the month, trading glass beads for items of local produce (Engelhardt 1930:4; Grant 1978:518). This first encounter was followed in December 1602 by a visitation of three ships under the command of Sebastian Vizcaino, and again in August 1769 by the land expedition by Gaspar de Portolá.

The Franciscan Padres Juan Crespi and Francisco Gomez accompanied the Portolá Expedition, and Crespi described the native “pueblo” as consisting of 30 large houses with no fewer than 400 inhabitants. The first Roman Catholic Mass was celebrated at this time, the location was renamed La Asuncion de Nuestra Senora, and the seeds of the coming Spanish mission system were planted in the local populace (Engelhardt 1930:6-10).

On Easter Sunday, March 31, 1782, Junipero Serra established the new “Mission of the Seraphic Doctor, San Buenaventura,” and left as its first residents Fr. Pedro Cambon and a small company of guards (Engelhardt 1930:16). The project area was within Mission San Buenaventura had primary jurisdiction. The introduction of the Spanish mission system into Ventureño territory brought about dramatic changes in the aboriginal way of life. Between the time of the establishment of the Mission San Buenaventura and that of Mexican independence and the secularization of the mission lands in 1834, ancient lifeways gradually began to disappear. Villages were abandoned, traditional marriage patterns were inhibited, hunting and gathering activities were disrupted as newly introduced agricultural practices altered the landscape, and large portions of the native population died from European diseases to which they lacked immunities.

Mission San Buenaventura flourished for nearly 50 years until a combination of factors led to its decline. The toll which introduced European diseases took on the neophyte population of native Chumash peoples, the waning financial support from Spain, and the eventual takeover by the newly established Mexican government in 1822, all weakened the entire mission system. The final blow came in 1833, when the Mexican government secularized the mission system. This action removed most of the mission property from the hands of the church and made it part of the public domain, available for lease or sale (Drapeau 1965). Perhaps to maintain the self-sufficient lifestyle of the mission, the church was allowed to keep, in addition to the church building itself, “... an enclosed garden of an area of about five hundred varas square more or less” (Drapeau 1965). The remainder of the vast mission tract was granted to José de Arnaz in 1846 and became the Ex-Mission Rancho (Drapeau 1965; Thompson and West 1883). The City of San Buenaventura was officially organized in 1866 encompassing lots in the immediate vicinity of the mission and dominated by non-Anglo inhabitants.

After the Treaty of Guadalupe Hidalgo in 1846, the Euroamericans took over California and declared that Governor Pio Pico did not have the authority to lease and sell mission lands.

The United States Lands Commission heard petitions for claims to mission lands and voided many of the transactions concluded under Pico's hegemony.

The Rancho Period has been romanticized in literature and film as a time of easy wealth and leisure notable for dashing horsemanship and Hispanic hospitality on a grand scale. The reality was the more prosaic work of making a living in the cattle business (Greenwood 1989:451-466). The discovery of gold in northern California created a boom in the cattle industry which fed the hordes of miners searching for gold. During the 1860s, the Euroamerican population grew rapidly, partly because many of the old rancho families lost title to their land, leaving a vacuum which was promptly filled by settlers from central and eastern United States.

In the 1860s homesteaders moved into Chatsworth and one of the initial families was Nels and Ann Johnson who homesteaded 160 acres beneath the Santa Susanna Pass (Roderick 2001:32). Chatsworth Railroad History begins in 1893 when the Southern Pacific completed what is known as the Burbank branch all the way to Chatsworth with a depot near the intersection of Topanga and Marilla. In 1898 an additional mile of track was added up through what is now the Oakwood Cemetery into the Chatsworth quarry, now a part of the Santa Susana Pass State Historic Park. The quarry sent sandstone boulders to a stone mill in Los Angeles to further shape and form the stone. They also delivered sandstone to San Pedro Harbor where they were used for the breakwater. In 1898, railroad construction began on a short-cut to Burbank from Ventura in what was called the Montalvo Cutoff. The most difficult work was encountered in the pass, where three separate tunnels were blasted for the most part out of solid rock. During that time, Chatsworth became a boom town, with many of the workers living in a "tent" city near the heading of the main tunnel. Although the listed resident population in Chatsworth is 23 in 1900, the tunnel construction brought in so many workers that by 1904 the Santa Susana School (now Chatsworth Park Elementary) at Devonshire and Topanga had 120 students (Vincent 2014).

Chatsworth Park South was closed in 2008 due to lead contamination. Contamination from lead bullets used in the 1950s and 1960s at a former gun club owned by actor Roy Rogers prompted the closure. Investigators discovered toxic soil contamination left over from shotgun pellets and clay pigeons used on its 12-acre skeet-shooting range.

West Valley Feeder No 1 is a concrete cylinder that conveys water to two agencies (Las Virgenes Municipal Water District and Calleguas Municipal Water District). The pipeline was constructed in 1962. West Valley Feeder No 1 was originally constructed by Calleguas Municipal Water District and originally named Calleguas Conduit Unit 4.

LITERATURE AND ARCHIVAL REVIEW

Record Search Summary: West Valley Feeder No. 1, Stage 3, MWD (Chatsworth)

RESULTS

Resources within Project Area: One, 19-150434 (1900 structure)

Site 19-150434 is the reported location of a ca. 1900 structure. The location was identified on the basis of a 1903 15 minute USGS quadrangle (Scale = 1:62,500 feet) and was not field verified at the time of recording (Edberg 1978). A Universal Transverse Mercator grid point was provided and compared with potential impact areas. Two of the contractor laydown areas on the east side of the project area are within approximately 300 feet of the reported location of the ca. 1900 structure.

Archaeological resources within search area (0.5 mi radius): 19

CA-LAN-448	CA-LAN-3498	CA-LAN-3579
CA-LAN-449	CA-LAN-3500	CA-LAN-120078
CA-LAN-640	CA-LAN-3505	CA-LAN-120084
CA-LAN-1028	CA-LAN-3506	CA-LAN-176735
CA-LAN-1126	CA-LAN-3507	
CA-LAN-2174	CA-LAN-3509	
CA-LAN-3494	CA-LAN-3512	

Three archaeological sites, CA-LAN-3507 (Mealey and Buxton 2004), CA-LAN-3512 (Mealey, Farmer, and Brodie 2005), and CA-LAN-120084 (Mealey, Farmer, and Brodie 2005) were recorded outside of and west of the western terminus of proposed project area, i.e., laydown areas, access road, and trail. The three sites are recorded between 450 feet and 1000 feet from the nearest portion of the project area. Two of the archaeological sites, CA-LAN-3507 and CA-LAN-3512), were identified as small dispersed flake scatters. The third site, CA-LAN-120084, consists of three mortared red bricks and a scattering of white quartz rocks.

Surveys/Reports including Project Area: None

Surveys/Reports within search area: 31

LA-81	LA-2252	LA-4123
LA-160	LA-2623	LA-4125
LA-397	LA-2645	LA-6599
LA-631	LA-2874	LA-7837
LA-853	LA-3009	LA-8255
LA-1015	LA-3185	LA-9070

LA-1050	LA-3340	LA-10569
LA-1051	LA-3452	LA-10637
LA-2002	LA-3487	LA-10651
LA-2079	LA-3499	LA11164
		VN-572

Historic Resources Inventory (HRI) results (0.5 mile search radius):

Evaluated Historical Resources: 1

- Old Santa Susana Stage Road

Local Historical Resources: 1

- City of Los Angeles Historic Cultural Monument No. 92, Old Stage Coach Trail Property (Old Santa Susana Stage Road), South Chatsworth Park

County Historical Resources: 1

- Ventura County Historical Landmark #104, Old Santa Susana Stage Road

California State Points of Historical Interest: None

California State Historical Landmarks: None

National Register of Historic Places Properties: 1

- Old Santa Susana Stage Road, Chatsworth, CA. NRHP Ref. No. 74000517, listed Oct. 1974.

Historic Maps:

1903 USGS Santa Susana, California, 15' quadrangle map.

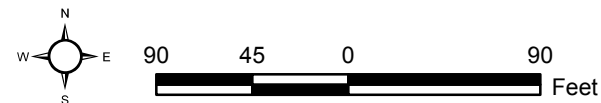
This map depicts a segment of the Santa Susana Tunnel, which carried a Southern Pacific Railroad line through the Santa Susana Pass, along with an above-ground section of the rail line, running east-west across the northern boundary of the current subject property. Also, within the study area is the western end of an unimproved (dirt) road that appears to have been a northwesterly extension of Devonshire Street. Along this road, in the immediate vicinity of the project area, were at least two dwellings, with three additional dwellings in close proximity to the southeast. Also, within 0.25 mile of the subject property, directly to the south, was a mining property with one associated dwelling. An unimproved road that provided access to the mine extended to the southeast, and this route continued to the northwest where it is depicted as a 'trail.' There were two or three additional dwellings located within 0.5 mile of the subject property, located around the western terminus of

D:\Projects\3MWD\0102\WestValleyFeeder\MXD\fieldmaps\fieldmap_11x17_20180816.mxd



Field Map

3MWD010204



(Rev: 08/22/2018 MMD) R:\Projects\MWD\3MWD010204\Graphics\fieldmaps\fieldmap_11x17_20180530.pdf

Figure 2. Project Impact Areas.

Devonshire Street. There were no additional historic features in the vicinity of the project area at this date.

1927 USGS Chatsworth, California, 6' quadrangle map.

This 1927 map only depicts the area east of the Los Angeles County line in detail. The unimproved road and dwellings that had been illustrated within and near the subject property on the 1903 map are no longer indicated. The railroad alignment remained along the north edge of the project area, and in addition to the segment of the Somis Branch of the Southern Pacific Railroad and Santa Susana Tunnel, the only historic feature depicted within 0.5 mile of the project area is a single dwelling located along the south side of the tracks immediately east of the project areas.

1933 USGS Chatsworth, California, 6' quadrangle map.

Like the 1925 map, this map illustrates only a few features west of the Ventura/Los Angeles County line. The only historic feature shown in proximity to the project area is the Somis Branch of the Southern Pacific Railroad, along its northern boundary.

1940 USGS Chatsworth, California, 6' quadrangle map.

The 1940 map depicts the Southern Pacific Railroad alignment and the Santa Susana Tunnel along the northern edge of the subject property. To the south, the Oakwood Cemetery had been established, and several new unimproved roads are indicated immediately north of the cemetery, approximately 0.5 mile from the subject property. No other historic features are represented within the search area.

1943 USGS Santa Susana, California, 15' quadrangle map.

In addition to the railroad alignment and tunnel, this map illustrates a new westward extension of Devonshire Street that had been established within 0.30 mile south of the project area by this date. There were approximately eight new residences along this unimproved roadway. Additionally, a trail is depicted to the southwest of the project areas that followed the base of the hills roughly 0.25 mile away. There was no additional historic development in the vicinity of the subject property at the time.

1951 USGS Santa Susana, California, 7.5' quadrangle map.

This map illustrates the western quarter of the search area for the project. It shows no historic features within that section beyond the Southern Pacific Railroad alignment.

1952 USGS Oat Mountain, California, 7.5' quadrangle map.

This map illustrates that by 1952, Devonshire Street had been extended to the base of the foothills south of the subject property, and this street was now paved. There was an unimproved road that continued northward from the west end of Devonshire, and along this road were two new residences within 1000 feet of the project areas. Beyond the Southern Pacific rail alignment and tunnel, there are no other buildings or historic features indicated in the vicinity of the subject property.

1969 USGS Oat Mountain, California, 7.5' quadrangle map.

The 1969 quadrangle map indicates that the unimproved roadway depicted on the 1952 map extending northward from the west end of Devonshire Street has been further extended to the north, to the southern boundary of the project areas. One new dwelling had been constructed at the north end of this road, and there was a second new dwelling near the east project area boundary. This was accessed by another new unimproved road that approached from the east. Also depicted is the Devonshire Golf Club, located within 0.25 mile southeast of the project areas. There were no additional historic features located in proximity to the project areas.

1969 USGS Santa Susana, California 7.5' quadrangle map.

This map is identical to the 1951 Santa Susana quadrangle map and depicts no historic features within this section of the search area beyond the Southern Pacific Railroad alignment.

Sanborn Map Co. Insurance Maps

There are no Sanborn insurance maps that include any portion of the record search area.

SURVEY RESULTS

The field survey was conducted on June 5 and 6, 2018 by John M. Foster, RPA. Visibility within the project area was generally poor with dense vegetation and steep slopes hindering observations of the ground surface. However, most of the impact areas (Figure 2) had excellent visibility, except for the proposed access road alignment, depicted in red on Figure 2. Transects with 10 meter spacing were conducted over each impact area.

Due to limited ground visibility in the western part of the project area, proposed alignment, it could not be determined if archaeological resources were present (Figure 2). The location of the ca. 1900 (19-150434) structure was carefully transected and no evidence of a structure was found. The scale of a 15 minute map makes precise locations difficult to determine and it likely that 19-150434 (1900 structure) is in the area but not in any of the proposed impact areas for this project.

It is evident from the closest recorded archaeological sites (dispersed flake scatters) that it is likely that additional flakes can be found under ideal conditions.

IMPACTS

Due to the limited ground visibility impacts to potential archaeological resources could not be determined for the proposed alignment. No archaeological resources were observed in the other impact areas.

RECOMMENDATIONS

The proximity of recorded archaeological resources coupled with poor ground visibility in some areas warrants a recommendation for monitoring by an archaeological and Native American monitor. Excavation strategies to determine if resources are present is not recommended since the closest archaeological sites consist of dispersed flake scatters and are not likely to be identified during the testing process. It is our opinion that monitoring would be the most effective means to identify cultural resources in the project areas.

In the event of an accidental discovery of any human remains in a location other than a dedicated cemetery, the steps and procedures specified in Health and Safety Code 7050.5, State CEQA Guidelines 15064.5(d), and Public Resources Code 5097.98 shall be implemented. Specifically, in accordance with Public Resources Code (PRC) Section 5097.98, the Los Angeles County Coroner shall be notified within 24 hours of the discovery of potentially human remains. The Coroner typically would then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she would contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with PRC Section 5097.98. The NAHC typically would then designate a Most Likely Descendant (MLD) with respect to the human remains within 48 hours of notification.

The MLD typically would then have the opportunity to recommend to the property owner or the project proponent means for treating or disposing of, with appropriate dignity, the human remains and associated grave goods within 24 hours of notification. Whenever the NAHC is unable to identify a MLD, or the MLD fails to make a recommendation, or the landowner or his or her authorized representative rejects the recommendation of the MLD and the mediation provided for in subdivision (k) of PRC Section 5097.94 fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative would re-inter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance.

References

Drapeau, Louis C.

- 1965 The Rancho Ex-Mission of Ventura County, California. *Ventura County Historical Society Quarterly* 11(1):8-23.

Edberg, Robert

- 1978 Historic Sites Sheet for 19-150434. On file, South Central Coastal Information Center.

Engelhardt, Fr. Zephyrin, O.F.M.

- 1930 *Mission San Buenaventura*. Schauer Printing Studios, Inc., Santa Barbara, CA.

Glassow, Michael A.

- 1980 Recent Developments in the Archaeology of the Channel Islands. In *The California Islands*, edited by D. Power, pp. 79-99. Santa Barbara Museum of Natural History, Santa Barbara.

Glassow, Michael A., and Larry Wilcoxon

- 1979 *Coastal Adaptations North and South of Point Concepcion, California, with Particular Regard to Shellfish Exploitation*. Paper presented at the 44th Annual Meeting of the Society for American Archaeology, Vancouver.

Grant, Campbell

- 1978 Eastern Coastal Chumash. In *California*, edited by Robert F. Heizer, pp 509-523. *Handbook of North American Indians*, vol. 8, William Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Greenwood, Roberta S.

- 1989 The California Ranchero: Fact and Fancy. In *Colombian Consequences, Archaeological and Historical Perspectives on the Spanish Borderlands West*, Vol. 1. David Hurst Thomas, editor, pp. 451-465. Smithsonian Institution Press, Washington and London.

Greenwood, Roberta S., and Robert O. Browne

- 1969 *The Browne Site: Early Milling Stone Horizon in Southern California*. *American Antiquity* 34(4), Society for American Archaeology.

Mealey, M. and M. Buxton

- 2004 Archaeological Site Record for CA-LAN-3507. On file, South Central Coastal Information Center.

Mealey, M., S. Farmer, and N. Brodie

- 2005 Archaeological Site Record for CA-LAN-3512. On file, South Central Coastal Information Center.

Roderick, Kevin

2001 *The San Fernando Valley, American's Suburb*. Los Angeles Times Books.

Thompson, Thomas H., and Albert Augustus West

1883 *History of Santa Barbara and Ventura Counties, California*. Thompson and West, Oakland.

Vincent, Ann

2014 Chatsworth Past & Present. [www.chatsworth history.com](http://www.chatsworthhistory.com).

APPENDIX E
ENERGY ANALYSIS

Energy Use Summary

Construction Phase (gallons/construction period)		Gasoline	Diesel		
Construction Vehicles		0	5,148		
Worker Trips		611	2		
Vendor Trips		55	1		
Haul Trucks		0	74		
Total		666	5,226		
Operations Phase (gallons/year)		Gasoline	Diesel	Natural Gas (kBTU/yr)	Electricity (kWh/yr)
Hotel		0	0	9,590,000	2,531,200
		0	0	0	0
		0	0	0	0
All Land Uses		0	0	9,590,000	2,531,200

Construction Offroad Equipment Fuel Use

PhaseName	OffRoadEquipmentType	OffRoadEq UsageHours	HorsePower	Load Factor	Horsepower Category	Num Days	Year	Fuel Consumption Rate (gal/hour)	Fuel Type	Total Fuel Consumption (gal/construction period)	
Demolition	Concrete/Industrial Saws	0	8	81	0.73	100	22	2019	4.7	Gasoline	0
Demolition	Rubber Tired Dozers	0	1	247	0.4	300	22	2019	4.5	Diesel	0
Demolition	Tractors/Loaders/Backhoes	1	6	97	0.37	100	22	2019	1.6	Diesel	78
Site Preparation	Excavators	1	8	158	0.38	175	21	2019	2.9	Diesel	184
Site Preparation	Graders	0	8	187	0.41	175	21	2019	3.1	Diesel	0
Site Preparation	Tractors/Loaders/Backhoes	0	8	97	0.37	100	21	2019	1.6	Diesel	0
Grading	Concrete/Industrial Saws	0	8	81	0.73	100	44	2019	4.7	Gasoline	0
Grading	Cranes	1	8	231	0.29	300	44	2019	3.3	Diesel	337
Grading	Excavators	1	8	158	0.38	175	44	2019	2.9	Diesel	386
Grading	Graders	1	8	187	0.41	175	44	2019	3.1	Diesel	454
Grading	Rubber Tired Dozers	0	1	247	0.4	300	44	2019	4.5	Diesel	0
Grading	Tractors/Loaders/Backhoes	1	6	97	0.37	100	44	2019	1.6	Diesel	155
Building Construction	Cranes	1	4	231	0.29	300	109	2019	3.3	Diesel	417
Building Construction	Excavators	1	8	158	0.38	175	109	2019	2.9	Diesel	956
Building Construction	Forklifts	0	6	89	0.2	100	109	2019	2.0	Diesel	0
Building Construction	Rubber Tired Dozers	1	8	247	0.4	300	109	2019	4.5	Diesel	1,555
Building Construction	Tractors/Loaders/Backhoes	1	8	97	0.37	100	109	2019	1.6	Diesel	513
Paving	Cement and Mortar Mixers	0	6	9	0.56	25	22	2019	0.4	Gasoline	0
Paving	Pavers	1	7	130	0.42	100	22	2019	1.7	Diesel	113
Paving	Rollers	0	7	80	0.38	100	22	2019	1.7	Diesel	0
Paving	Tractors/Loaders/Backhoes	0	7	97	0.37	100	22	2019	1.6	Diesel	0
Total										5,148	
Total								Total	Gasoline	-	
Total								Total	Diesel	5,148	

Year 2020

Year 2020

Vehicle Types	MPG by Fuel Type			Population by Fuel Type			
	GAS	DSL	ELEC	GAS	DSL	ELEC	Total
LDA	29.3	46.3		6,343,244	51,116	90,986	6,394,359
LDT1	25.2	22.1		692,885	447	2,466	693,332
LDT2	23.0	33.7		2,169,628	11,368	12,535	2,180,995
LHDT1	10.3	21.0		178,175	106,680		284,856
LHDT2	9.0	19.0		29,750	41,895		71,645
MCY	36.5			276,048			276,048
MDV	18.8	25.9		1,557,729	27,452	3,954	1,585,180
MH	5.0	10.4		36,101	12,007		48,108
MHDT	5.0	10.1		25,210	120,277		145,487
HHDT	3.9	6.4		88	103,820		103,908
OBUS	4.9	8.1		5,971	4,179		10,150
SBUS	9.0	7.4		2,328	6,543		8,871
UBUS	4.8	6.3		938	18	17	956

Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length
Demolition	3	0	2	14.7	6.9	20
Site Preparation	3	0	18	14.7	6.9	20
Grading	10	0	4	14.7	6.9	20
Building Construction	3	1	0	14.7	6.9	20
Paving	3	2	0	14.7	6.9	20

Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length
Demolition	3	0	2	14.7	6.9	20
Site Preparation	3	0	18	14.7	6.9	20
Grading	10	0	4	14.7	6.9	20
Building Construction	3	1	0	14.7	6.9	20
Paving	3	2	0	14.7	6.9	20

Demolition	66	0	2	14.7	6.9	20
Site Preparation	63	0	18	14.7	6.9	20
Grading	440	0	4	14.7	6.9	20
Building Construction	327	109	0	14.7	6.9	20
Paving	66	44	0	14.7	6.9	20

Demolition	66	0	2	14.7	6.9	20
Site Preparation	63	0	18	14.7	6.9	20
Grading	440	0	4	14.7	6.9	20
Building Construction	327	109	0	14.7	6.9	20
Paving	66	44	0	14.7	6.9	20

Gasoline Consumption			Diesel Consumption		
Worker	Vendor	Haul	Worker	Vendor	Haul
42	0	0	0	0	6
40	0	0	0	0	56
279	0	0	1	0	12
208	39	0	1	1	0
42	16	0	0	0	0
611	55	0	2	1	74

APPENDIX F
REPORT OF GEOTECHNICAL STUDY



**REPORT OF GEOTECHNICAL STUDY
WEST VALLEY FEEDER 1 ACCESS ROADS AND
VALVE IMPROVEMENTS
WIDENING PROJECT
CHATSWORTH, CALIFORNIA**

MAY 15, 2018

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PROJECT FOR WHICH THIS REPORT WAS PREPARED.**



May 15, 2018
Kleinfelder Project No. 20180213.002A

Mr. Bei Su, PE
Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, California 90012

**SUBJECT: Final Report of Geotechnical Study
West Valley Feeder 1 Access Roads and Valve Improvements
Chatsworth, California**

Dear Mr. Su:

Kleinfelder is pleased to present this report summarizing our geotechnical investigation for the subject project. The purpose of our geotechnical investigation was to evaluate subsurface conditions and provide geotechnical recommendations for the design and construction of the proposed project. The conclusions and recommendations presented in this report are subject to the limitations presented in Section 6.

We appreciate the opportunity to provide geotechnical engineering services to you on this project. If you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned at 951.801.3681.

Sincerely,

KLEINFELDER WEST, INC.

Jeffery D. Waller, PE, GE
Senior Geotechnical Engineer



Michael O. Cook, PG, CEG
Senior Engineering Geologist



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- 2 Direct Shear Results and Slope Stability Parameters
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- 5 Asphalt Concrete Pavement Sections
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- 1 Site Vicinity Map
- 2 Field Exploration Location Map
- 3 Regional Geologic Map
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APPENDICES

- A Field Explorations
- B Laboratory Testing
- C Seismic Refraction Survey Report

1 INTRODUCTION

Kleinfelder performed a geotechnical study for Metropolitan Water District of Southern California (MWD) for the proposed project in Chatsworth, California. This report summarizes the results of our field exploration, laboratory testing, and engineering analysis and provides recommendations for design and construction for the subject project. The approximate location of the project presented in this report is shown on Figure 1, Site Vicinity Map. The purpose of our geotechnical study was to evaluate subsurface soil conditions and provide geotechnical recommendations for the design and construction of the proposed project. The scope of our services was presented in our proposal dated December 1, 2017.

Our report includes a description of the work performed, a discussion of the geotechnical conditions observed at the site, and recommendations developed from our engineering analyses of field and laboratory data.

1.1 PROJECT DESCRIPTION

We understand the proposed project includes improvements to manholes and valve structures along the West Valley Feeder No. 1, and construction of two new access roads to provide maintenance access to the pipeline and valve structures. The roads are proposed to be constructed with Portland cement concrete (PCC) and may have sections where asphaltic concrete (AC) is used. On each alignment, a concrete Arizona crossing is also proposed at the location where the access roads cross the existing seasonal creeks.

Preliminary Plan and Profile documents for the project were reviewed in preparation of this report. The location of the proposed alignment selected by MWD are shown on Figure 2, Field Exploration Location Map. The proposed alignments may have small retaining walls. In steep sections of the roadway, concrete keys are proposed beneath the pavement to reduce the potential for sliding of the pavement.

1.2 SCOPE OF SERVICES

The scope of our geotechnical study consisted of a literature review, site reconnaissance, subsurface explorations, geotechnical laboratory testing, engineering evaluation and analysis,

and preparation of this report. A description of our scope of services performed for the geotechnical portion of the project follows.

Task 1 – Background Data Review. We reviewed readily-available published and unpublished geologic literature in our files and the files of public agencies, including selected publications prepared by the California Geological Survey, California Division of Mines and Geology, and the U.S. Geological Survey. We also reviewed readily available seismic and faulting information, including data for designated earthquake fault zones as well as our in-house database of faulting in the general site vicinity.

Task 2 – Field Exploration. On June 19, 2017, representatives of Kleinfelder and MWD met at the project site to perform reconnaissance of the proposed alignments and the current conditions. Each of the proposed alignments and many of the valve structures to be reconstructed were observed as well.

Kleinfelder supervised exploration of 5 hollow stem auger borings. The approximate locations of the borings are presented on Figure 2, Field Exploration Location Map. The borings were drilled to provide general information in order to characterize subsurface materials and perform our analyses.

Prior to beginning subsurface exploration, each of the 5 boring locations were marked and Kleinfelder notified Underground Service Alert (USA) of our intent to dig in accordance with California State law.

All exploratory borings were drilled and logged on January 30, 2018. The borings were advanced to depths ranging from approximately 11½ to 21½ feet below the existing ground surface (bgs) using a limited access track-mounted drill rig operated by 2R Drilling of Chino, California. Bulk and drive samples were retrieved from the borings, sealed and transported to our laboratory for further evaluation. A staff professional of Kleinfelder supervised the sampling, logged and visually classified the excavated soil cuttings and samples retrieved. Bulk soil samples were generally collected within the upper 5 feet of each boring and drive samples were collected at approximate 5-foot intervals using split-spoon samplers. With the exception of Boring B-3, the excavated soil cuttings were used to backfill the excavations. Boring B-3 was backfilled with a cement/bentonite grout due to concerns of potential lead contamination due to

being located near a previous shooting range. The Logs of Borings B-1 through B-5 are included in Appendix A, Field Explorations at the end of this report. The approximate locations of the borings are shown on Figure 2, Field Exploration Location Map.

On January 11, 2018, two Seismic Refraction Surveys were performed at the site by Advanced Geoscience Inc. (AGI) and their approximate locations are shown on Figure 2. AGI completed their field work and processed the data using the RAYFRACT program to prepare scaled, 2D elevation profiles of the seismic compressional-wave velocity layering. The Summary Report prepared by AGI is presented in Appendix C, Seismic Refraction Survey Report.

Task 3 – Laboratory Testing. Laboratory testing was performed on selected samples to provide parameters for engineering evaluation. Testing consisted of in-situ density and moisture content, sieve and hydrometer, direct shear, expansion index, maximum density and optimum moisture, R-value, and Preliminary Corrosion Potential. Descriptions of the laboratory tests performed and the results of the testing are presented in Appendix B, Laboratory Testing.

Task 4 – Geotechnical Analyses. Field and laboratory data were analyzed in conjunction with our understanding of the proposed project from the referenced MWD Civil Drawings to provide geotechnical recommendations for the design and construction of the proposed access roads and valve structure improvement. Seismic parameters presented are based on the 2016 California Building Code (CBC).

Task 5 – Report Preparation. This report summarizes the work performed, data acquired, and our findings, conclusions, and geotechnical recommendations for the design and construction of the proposed improvements. The report includes the following items:

- Site location map and site plan showing the approximate boring locations;
- Logs of borings (Appendix A);
- Results of laboratory tests (Appendix B);
- Seismic Refraction Survey Summary Report by AGI (Appendix C);
- Discussion of general site conditions;
- Discussion of general subsurface conditions as encountered during field exploration;
- Discussion of regional and local geology and site seismicity;

- Discussion of geologic and seismic hazards;
- Recommendations for site preparation, earthwork, temporary slope inclinations, fill placement, and compaction specifications, including excavation characteristics of subsurface soil deposits;
- Recommendations for retaining wall foundation design, allowable bearing pressures, and embedment depths;
- Recommendations for seismic design parameters in accordance with the 2016 CBC;
- Preliminary slope stability conclusions for Cross Section C, WVF1 Station 1415+42 access road section at Station 1+50 for Option 1, presented on the MWD Civil Drawings; and
- Preliminary slope stability conclusions for Cross Section F, WVF1 Station 1416+33 access road section at Station 2+20 for Option 2, presented on the MWD Civil Drawings.

2 SITE DESCRIPTION

2.1 SITE DESCRIPTION

The project site is located in the Chatsworth area of the City of Los Angeles, California. Chatsworth Park South bounds the site on the south and east sides. Hillside areas with local rugged rock outcrops, intervening drainage channels, and local dense vegetation bound the access road locations on the north and west sides. The southern and eastern portions of the access road locations are low-lying areas with sparse vegetation. Surface water was observed flowing within one of the drainage channels during the June 19, 2017, site visit. The channel is located at approximate Station 0+68 as shown on the referenced MWD Civil Drawings (MWD, 2018).

3 GEOLOGY

3.1 REGIONAL GEOLOGIC SETTING

The site is located within the western Transverse Ranges geomorphic province (Norris and Webb, 1990). The Transverse Ranges province is characterized by roughly east-west trending, convergent structural features in contrast to the predominant northwest-southeast structural trend of Coast Ranges and Peninsular geomorphic provinces in California (CGS, 2002). The Transverse Ranges province's east-west trending folds and faults are due to north-south tectonic compression from movement along the San Andreas fault system, resulting in one of the most seismically active regions in California. The western Transverse Ranges extends generally from the Los Angeles/San Bernardino County line on the east to Point Arguello west of Santa Barbara.

Structurally, the portion of the western Transverse Ranges where the project site is situated is bounded on the north by the Sierra Madre fault zone – San Fernando section and the Santa Monica Mountains to the south.

The primary geologic unit comprising the foothills of the project area is the Upper Cretaceous Chatsworth Formation. The Chatsworth Formation is a turbidite sequence of marine fan deposits composed primarily of arkosic sandstones (Link et al., 1984) with lesser siltstones and conglomerates interbedded with shales (Cilona et al., 2016). Young alluvial fan deposits underly the San Fernando Valley east of the project site. The geologic units are presented on Figure 3, Regional Geologic Map.

3.2 SUBSURFACE CONDITIONS

Subsurface conditions at the project site consist of young alluvial deposits overlying bedrock of the Cretaceous-age Chatsworth Formation. On January 30, 2018, Kleinfelder drilled five borings to a maximum depth of 21.5 feet below ground surface.

The following is a general description of the subsurface conditions and the bedrock characteristics that can be applied to subsurface conditions at the locations explored. Subsurface materials encountered at the locations explored generally consisted of a thin veneer

of artificial fill or native young alluvium overlying bedrock of the Chatsworth Formation. Detailed descriptions of the deposits are provided in our logs of borings presented in Appendix A.

3.2.1 Fill and Native Soils

Fill and alluvial soils encountered generally consisted of medium dense to dense silty sand to sand with gravel and some sandy clay. These soils were generally present locally within the upper 3 to approximately 5 feet except in B-3, where it extended to 16.5 feet (maximum depth explored). Laboratory testing of two bulk samples of subgrade soils collected at borings B-3 and B-5 resulted in R-values of 19 and 29, respectively. Laboratory dry density in boring B-3 of the native soil was approximately 113 pounds per cubic-foot (pcf) with a moisture content of approximately 6.7 percent.

3.2.2 Bedrock

Bedrock is predominantly comprised of a fine-grained yellow-brown sandstone of the Chatsworth Formation. The bedrock is thickly-bedded (3-10 feet thick) and uniformly dip to the northwest between approximately 10 and 15 degrees. Bedrock materials encountered below native and fill soils were consistent with Chatsworth Formation with blow counts greater than 50 for 6 inches. Laboratory dry densities of samples with bedrock materials ranged from approximately 98 to 118 pounds per cubic-foot (pcf). Laboratory moisture contents ranged from approximately 3.6 to 12.2 percent.

3.3 GROUNDWATER

Groundwater was not encountered in any of the borings performed at the site on January 30, 2018. There are no known active groundwater wells or monitoring wells on or within near proximity to the project site. Since the sites elevation is approximately 50 to 110 feet higher than the general ground surface of the San Fernando Valley located to the east, we do not anticipate encountering groundwater in areas underlain by shallow bedrock. Although not encountered in the borings, shallow perched groundwater could occur in areas underlain by alluvium.

Fluctuations of the groundwater level, localized zones of perched water, and variations in soil moisture content should be anticipated during and following the rainy season (late fall to early spring). Irrigation of landscaped areas on and adjacent to the site can also cause a fluctuation of

local groundwater levels.

3.4 FAULTING

There is a high potential for moderate to strong seismic activity to occur during the design life of the project. The site is in the highly seismic Southern California region within the influence of several fault systems that are considered to be active or potentially active. An active fault is defined by the State of California as being a “sufficiently active and well defined fault” that has exhibited surface displacement within Holocene time (about the last 11,000 years). A potentially active fault is defined by the State as a fault with a history of movement within Pleistocene time (between 11,000 and 1.6 million years ago). These active and potentially active faults are capable of producing potentially damaging seismic shaking at the site. It is anticipated that the project site will periodically experience ground acceleration as the result of earthquakes. Active faults without surface expression (blind faults) and other potentially active seismic sources, which are capable of generating earthquakes, are not currently zoned and are known to be locally present under the region.

The site is not located within a State of California Earthquake Fault Rupture Hazard Zone (Bryant and Hart, 2007, CGS, 2017). Based on our geologic literature review, no mapped active or potentially active fault traces are known to transect the project site (Treiman, 2000). The closest active fault to the site is the Sierra Madre fault Zone – Santa Susana and San Fernando sections faults located approximately 7.0 miles and 7.5 miles, respectively from the site (Barrows et al., 1975).

3.5 SEISMIC HAZARD ZONES

The project site is not located within a State of California designated area with potential liquefaction or earthquake-induced landslide zones (CGS, 2017). See Section 4.2.1 for the results of our liquefaction analysis at the site.

Landslides are ground failures (several tens to hundreds of feet deep) in which a (mass of earth material, including debris and often portions of bedrock) large section of a slope detaches and slides downhill. Landslides are not to be confused with minor surficial slope failures (slumps), which are usually limited to the topsoil zone and can occur on slopes composed of almost any geologic material. Landslides can cause damage to structures both above and below the slide mass.

Structures above the slide area are typically damaged by undermining of foundations. Areas below a slide mass can be damaged by being overridden and crushed by the failed slope material.

Several factors can increase the potential for landsliding; slope angle, rock or soil type, bedding and foliation orientation, persistence of fractures, fracture density, zones of shearing or faulting, weathering, clay content, seismicity, water content, groundwater and the presence or absence of vegetation.

Although the area of the project site is not identified as a landslide hazard zone, some of these risk factors for landslides do exist at the site including: sloping terrain, the presence of nearby active faults, and historic seismic shaking.

3.6 FLOOD HAZARD

The Federal Emergency Management Agency (FEMA) maintains a collection of Flood Insurance Rate Maps (FIRM), which cover the entire United States. These maps identify those areas which may be subjected to 100 year and 500-year cycle floods. Based on our review of FEMA map panel 1040F (FEMA, 2008) the elevated portions of the site are situated within Zone D area in which flood hazards are undetermined, but possible. The southernmost portion of the project site is located within Zone A where there is a 1% annual chance of flood (100-year flood). No Base Flood Elevations are determined. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

3.7 EXPANSIVE SOILS

Expansive soils are characterized by their ability to undergo significant volume change (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall, landscape irrigation, utility leakage, perched groundwater, drought, or other factors and may cause unacceptable settlement or heave of pavements, sidewalks, curbs, gutters and other structures supported over these materials. The soils generally encountered during our study were granular and based on the Expansion Index test performed, they have a low to medium expansion potential.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL

Based on the results of our field exploration, laboratory testing and engineering analyses conducted during this study, it is our professional opinion that the proposed project is geotechnically feasible, provided the recommendations presented in this report are incorporated into the project design and construction. The primary geotechnical considerations for site development are the presence of bedrock, stability of proposed slope cuts, and construction of pavement on a relatively steep grade.

The following opinions, conclusions, and recommendations are based on the properties of the materials encountered in the borings, the results of the laboratory-testing program, and our engineering analyses performed. Our recommendations regarding the geotechnical aspects of the design and construction of the project are presented in the following sections.

4.2 SEISMIC DESIGN CONSIDERATIONS

It is our understanding that after January 1, 2017, jurisdictional agencies review of proposed development will be based on the 2016 California Building Code (CBC). According to the 2016 CBC, every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7-10 (ASCE, 2010), excluding Chapter 14 and Appendix 11A. The seismic design category for a structure may be determined in accordance with Section 1613 of the 2016 CBC or ASCE 7-10. Based on the subsurface conditions encountered, the site can be classified as Site Class C. We have assumed that proposed structures will have a period of less than ½ second. This assumption should be verified by the project structural engineer.

The 2016 CBC seismic design parameters for the proposed access roads are summarized in Table 1.

Table 1
2016 CBC Seismic Design Parameters*

Site Class	C
Risk Category	I, II, and III
S_s (Figure 1613.3.1(1)) (g)	2.184
S_1 (Figure 1613.3.1(2)) (g)	0.695
F_a (Table 1613.3.3(1))	1.0
F_v (Table 1613.3.3(2))	1.3
S_{MS} (Equation 16-37) (g)	2.184
S_{M1} (Equation 16-38) (g)	0.904
S_{DS} (Equation 16-39) (g)	1.456
S_{D1} (Equation 16-40) (g)	0.603
PGA_M (ASCE 7-10 Equation 11.8-1) (g)	0.815

*Section references above are to the 2016 CBC unless otherwise noted.

4.2.1 Liquefaction

The term liquefaction describes a phenomenon in which saturated, cohesionless soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and undergo lateral spreading. The factors known to influence liquefaction potential include soil type, relative density, grain size, confining pressure, depth to groundwater, and the intensity and duration of the seismic ground shaking. The cohesionless soils most susceptible to liquefaction are loose, saturated sands and some silt.

Based on the properties of the soils encountered in our test borings and our knowledge of geologic conditions in the area of the site, a site class of 'C' is considered appropriate as determined from Table 1613.5.2 of the 2016 California Building Code. The characteristics of the

soil/bedrock, and depth to groundwater indicate that the site soils have a remote potential for liquefaction during a design-level earthquake.

4.3 EARTHWORK

Site preparation and earthwork operations should be performed in accordance with applicable codes, safety regulations and other local, state or federal specifications, and the recommendations included in this report. References to maximum unit weights are established in accordance with the latest version of ASTM Standard Test Method D1557. The earthwork operations should be overseen by a professional engineer from Kleinfelder.

4.3.1 Site Preparation

Existing pavements, utilities and other abandoned improvements should be demolished and removed from the site. All debris produced by demolition operations, including wood, steel, piping, plastics, etc., should be separated and disposed off-site. Existing abandoned utility pipelines which extend beyond the limits of the proposed construction and are to be abandoned in place, should be plugged with cement grout to prevent migration of soil and/or water. Demolition, disposal and grading operations should be overseen by a professional engineer from Kleinfelder.

Prior to general site grading, existing vegetation, organic topsoil, debris, and oversized materials (greater than 6 inches in maximum dimension) should be stripped and disposed outside the construction limits. Deeper stripping or grubbing may be required where higher concentrations of vegetation are encountered during site grading. The stripping work should include the removal of existing fill embankments, undocumented fill, and topsoil that, in the judgment of the geotechnical engineer, is compressible or contains significant voids. The stripping operation must expose a firm, non-yielding subgrade, or competent bedrock that is free of large voids. Stripped topsoil (less any debris) may be stockpiled and reused for landscaping purposes; however, this material should be evaluated for suitability if it is desired to use this material for engineered fill below structures.

Grading operations during the wet season or in areas where the soils are saturated may require significant provisions for drying of soils prior to compaction. If the project necessitates fill placement and compaction in wet conditions, we can provide alternatives for drying the soil.

Conversely, additional moisture may be required during the dry months. A sufficient water source should be available to provide adequate water during compaction. During dry months, moisture conditioning of the subgrade soils may be required if left exposed for greater than a few days.

4.3.2 Overexcavation

Organic, inert and oversized materials (greater than 6 inches in maximum dimension) should be stripped and isolated prior to removal of reusable soils. Pavement should be stripped and disposed off-site. Overexcavation should remove any loose or soft earth materials until a firm, relatively unyielding subgrade or competent bedrock is exposed, free of significant voids and organics. The subgrade soils exposed at the bottom of overexcavation should be observed or overseen by a professional engineer from our office prior to the placement of any fill. Prior to the placement of engineered fill, after site preparation, the bottom of the overexcavations should be proof-rolled and compacted to at least 90 percent relative compaction to the satisfaction of the geotechnical engineer-of-record. Additional removals, scarification and drying operations, and/or subgrade reinforcement may be required to stabilize soft, yielding subgrades.

The grading contractor should anticipate that additional processing and moisture conditioning of the onsite soils will be necessary during site grading to obtain material which is acceptable to be placed as engineered fill, as described in this report. The moisture conditioning of some of the soils will require significant drying and some soils will require the addition of moisture. These conditions could hamper equipment maneuverability and efforts to compact site soils to the recommended compaction criteria. Disking to aerate, chemical treatment, replacement with drier material, stabilization with a geotextile fabric or grid, or other methods may be required to mitigate the effects of excessive soil moisture and facilitate earthwork operations.

The grading contractor should also anticipate encountering oversized material greater than 6 inches in maximum dimension during excavation. Quantifying the actual amount of oversize material that could be encountered requires additional study.

Overexcavation of Pavements and Areas to Receive Fill: Pavements and areas to receive fill should be underlain by at least 2 feet of engineered fill. We recommend that overexcavation for pavements extend at least 2 feet below the bottom of pavement section and at least 2 feet

below existing grade and proposed finished subgrade elevations. The 2 feet of overexcavation may be performed by overexcavating 18 inches of soil and scarifying, moisture conditioning, and compacting the bottom 6 inches of the excavation. Where the existing fill is deeper than 2 feet below bottom of pavement subgrades, we recommend that the overexcavation be deepened to remove existing fill soils.

We understand that reinforced concrete keys are proposed to be placed beneath the pavement in the steeper area of the proposed roadway. Due to the depth of the key, we anticipate that the excavation will extend into the competent bedrock. However, once excavated, the material at the bottom of the key should be evaluated by a representative of the Geotechnical Engineer of Record and may need to be extended deeper if unsuitable soils or unsuitable bedrock are encountered. If the excavation is extended, MWD may select to extend the key deeper with concrete or backfill the overexcavated area with engineered fill in accordance with the Engineered Fill section below.

On the downhill side, engineered fill should extend to the bottom of the key. The engineered fill should extend at least 2 feet laterally from the key and be placed as described below in the Engineered Fill section.

4.3.3 Scarification and Compaction

Following site stripping and any required grubbing and/or overexcavation, in areas to receive engineered fill that are not in competent bedrock should be scarified to a minimum depth of 8 inches, uniformly moisture-conditioned to a moisture content to near the optimum moisture content and compacted to at least 90 percent of the maximum dry density obtained using ASTM (American Society for Testing and Materials) Test Method D1557.

4.3.4 Rippability

The excavation and rippability of the existing bedrock was evaluated by performance of a seismic refraction survey. We have included the Summary Report as Appendix C of this report.

4.3.5 Engineered Fill

We anticipate that most of the on-site soils may be reusable as engineered fill once debris and oversized materials greater than 6 inches in diameter have been removed, and after any vegetation and organic debris is cleared and disposed off site. Fill should be placed in lifts no greater than 8 inches thick, loose measurement, and should be compacted to at least 90 percent of the maximum dry density. The moisture content of the soil should be within approximately 0 to 3 percent above the optimum moisture content. Any imported fill materials to be used for engineered fill should be sampled and tested for approval by the geotechnical engineer prior to being transported to the site. In general, well-graded mixtures of gravel, sand and non-plastic silt are acceptable for use as import fill.

Engineered fill should be compacted to at least 90 percent of maximum dry density obtained by the ASTM D1557 method of compaction with the upper 6 inches below pavements and structures compacted to at least 95 percent relative compaction.

In areas where the site needs to be raised in elevation per the MWD civil drawings, prior to the placement of engineered fill, the upper 24 inches below the existing site grade of the existing soils should be overexcavated and replace with engineered fill.

4.3.6 Temporary Excavations

All excavations must comply with applicable local, state, and federal safety regulations including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing the information below solely as a service to our client. Under no circumstances should the information provided be interpreted to mean that Kleinfelder is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred.

The borings were advanced using a track-mounted, hollow-stem auger drill rig. Drilling was completed with moderate effort through the existing soil deposits and moderate to difficult drilling in the bedrock. Conventional earth moving equipment, as presented in the AGI report in Appendix C, should be capable of performing the excavations required for site development.

Near-surface soils encountered during our field investigation consisted predominantly of silty sand, clayey sand, and sand with silt. In our opinion, the soil encountered in our borings would be considered a Type 'C' soil with regard to the OSHA regulations. For this soil type, OSHA requires a maximum slope inclination of 1.5:1 (H:V) or flatter for excavations 20 feet or less in depth. Bedrock, due to its weathered condition, may be considered as a Type 'B' soil type with respects to OSHA regulations. Steeper cut slopes may be utilized for excavations less than 5 feet deep, depending on the strength, moisture content, and homogeneity of the soil/bedrock as observed during construction.

4.3.7 Pipe Bedding and Trench Backfill

If required, pipe bedding and pipe zone material should consist of sand or similar granular material having a minimum sand equivalent value of 30. The sand should be placed in a zone that extends a minimum of 6 inches below and 6 inches above the pipe for the full trench width. The bedding material should be compacted to a minimum of 90 percent of the maximum dry density or to the satisfaction of the geotechnical engineer's representative observing the compaction of the bedding material. Bedding material should consist of sand, gravel, crushed aggregate, or native free-draining granular material with a maximum particle size of 3/4 inch. Bedding materials should also conform to the pipe manufacturer's specifications, if available. Trench backfill above bedding and pipe zone materials may consist of approved, on-site or import soils placed in lifts no greater than 8 inches loose thickness and compacted to 90 percent of the maximum dry density based on ASTM Test Method D1557. Jetting of backfill is not recommended.

4.3.8 Stockpiling Excess Material

All stockpiles of excess soil materials should be kept away from the top of the excavations a minimum distance equal to the depth of the excavation. We recommend that stockpiles be constructed with a slope ratio of at least 2:1 (horizontal to vertical) and compacted to at least 85 percent relative compaction. The height of stockpiles should not exceed 10 feet. Compaction requirements and slope ratios are provided only for temporary stockpiling considerations, such as erosion control and temporary influences on excavations. We have not considered any long-term or structural support usage of stockpiles.

TEMPORARY SHORING

General

Temporary shoring may be required in areas adjacent to existing structures or improvements where excavations cannot be adequately sloped. Temporary shoring may consist of a turn-key shoring system, soldier piles and lagging, or other system. Recommendations for design of temporary shoring are presented below.

The shoring design should be provided by a civil engineer registered in the State of California and experienced in the design and construction of shoring under similar conditions. Once the final excavation and shoring plans are complete, the plans and design should be reviewed by Kleinfelder for conformance with the design intent and geotechnical recommendations provided herein.

Lateral Pressures

For the design of cantilevered shoring, an equivalent fluid pressure of 35 pounds per cubic foot (pcf) may be used for level backfill. Where the surface of the retained earth slopes up away from the shoring, a greater pressure should be used. Design data can be developed for additional cases when the design conditions are established.

In addition to the recommended earth pressure, any surcharge (live, including traffic, or dead load) located within a 1:1 plane drawn upward from the base of the shored excavation should be added to the lateral earth pressures. The lateral contribution of a uniform surcharge load located immediately behind the wall may be calculated by multiplying the surcharge by 0.5 for the level backfill condition. Lateral load contributions of surcharges located at a distance behind the shored wall may be provided once the load configurations and layouts are known. As a minimum, a 2-foot equivalent soil surcharge (250 psf) is recommended to account for nominal construction loads. It should be noted that the above pressures do not include hydrostatic pressure and assume groundwater will not be encountered in the excavation, or dewatering will be used to lower the ground water table below the bottom of the excavation.

Design of Soldier Piles

All soldier piles should extend to a sufficient depth below the excavation bottom to provide the required lateral resistance. We recommend the required embedment depths be calculated based on the principles of force and moment equilibrium. For this method, the allowable passive pressure against soldier piles that extend below the level of excavation may be assumed to be equivalent to a fluid pressure of 250 pcf. The maximum lateral resistance value should not exceed 3,000 psf. To account for arching, the passive resistance may be assumed to act over a width 3.0 times the width of the embedded portion of the pile, provided adjacent piles are spaced at least 2.5 pile diameters, center-to-center.

Drilling of the soldier pile shafts can be accomplished using heavy-duty drilling equipment. Temporary steel casing may be required to stabilize the sides of the pile shaft. Concrete for piles should be placed immediately after the drilling of the hole is complete. The concrete should be pumped to the bottom of the drilled shaft using a tremie. Once concrete pumping is initiated, a minimum head of 5 feet of concrete above the bottom of the tremie should be established and maintained throughout the concrete placement to prevent contamination of the concrete by soil inclusions. If steel casing is used, the casing should be removed as the concrete is placed.

To develop full lateral resistance, provisions should be taken to assure firm contact between the soldier piles and undisturbed materials. The concrete placed in the soldier pile excavations may be a lean-mix concrete. However, the concrete used in that portion of the soldier pile that is below the planned excavated level should provide sufficient strength to adequately transfer the imposed loads to the surrounding materials.

Lagging

Continuous treated timber lagging should be used between the soldier piles. The lagging should be installed as the excavation proceeds. If treated timber is used, the lagging may remain in place after backfilling. The lagging should be designed for the recommended earth pressure but limited to a maximum value of 400 psf.

Deflection

Shoring adjacent to existing structures or improvements should be designed and constructed to reduce potential movement. The shoring system designer should evaluate potential deflections in their design.

Monitoring

Some deflection of the shored excavation should be anticipated during the planned excavation. We recommend the project civil engineer perform a survey of all existing utilities and structures adjacent to the shored excavation. The purpose of this survey would be to evaluate the ability of existing utility lines or improvements to withstand horizontal movements associated with a shored excavation and to establish the baseline condition in case of unfounded claims of damage. If existing improvements are not capable of withstanding anticipated lateral movements, alternative shoring systems may be required.

Horizontal and vertical movements of the shoring system should be monitored by a licensed surveyor. The construction monitoring and performance of the shoring system are ultimately the contractor's responsibility. However, at a minimum, we recommend that the top of shoring be surveyed prior to excavation and that the top and bottom of the soldier beams be surveyed on a weekly basis until the shoring is not needed. Surveying should consist of measuring movements in vertical and two perpendicular horizontal directions.

4.4 FOUNDATIONS

4.4.1 General

Based on the results of our field exploration, laboratory testing and geotechnical analyses, the proposed retaining walls or culvert (if needed) may be supported on conventional spread foundations placed entirely on engineered fill or competent bedrock. If founded on engineered fill, spread foundations should be underlain by a minimum 2 feet of engineered fill constructed as recommended above. Recommendations for the design lateral earth pressures and design of spread foundations are presented below. Transitions from bedrock to engineered fill beneath a single footing should be avoided. If this condition exists, the bedrock portion should be overexcavated to provide the minimum fill thickness recommended above.

The recommended lateral earth pressures assume that drainage is provided behind the walls to prevent the buildup of hydrostatic pressures. Walls should be provided with drains to reduce the potential for the buildup of hydrostatic pressure. Drains may consist of a 2-foot-wide zone of $\frac{3}{4}$ -inch rock wrapped in filter fabric located immediately behind the wall extending to within 1 foot of the ground surface. Perforated Schedule 40 PVC pipe should be installed within the rock at the base of the drain and sloped to discharge to a suitable collection facility. Commercially available drainage panels could be used as an alternative. The product manufacturer's recommendations should be followed in the installation of a drainage panel. Expansive soils should not be used as wall backfill material.

Where slope extend at inclinations greater than horizontal behind retaining walls, a minimum of a 2-foot width drainage swale should be constructed at the top of the wall to limit the amount of surface water infiltrating behind the wall

4.4.2 Shallow Foundations

Shallow foundation constructed on engineered fill, or entirely on competent bedrock, may be designed for a net allowable bearing pressure of 2,500 pounds per square foot (psf) for dead plus sustained live loads. The foundations should be established at a depth of at least 18 inches below the lowest adjacent exterior grade if founded on soils or at least 12 inches if founded into competent bedrock. A one-third increase in the above bearing pressures can be used for wind or seismic loads.

The structural engineer should design the footing dimension and reinforcement; however shallow foundations should have a minimum width 24 inches. Structurally continuous foundations should not be directly founded on both engineered fill and bedrock. If the proposed foundations are anticipated to directly bear on both engineered fill and bedrock, a structural break should be constructed in the foundation to limit the distress caused by differential settlement. Compaction requirements should follow section 4.3.5 Engineered Fill.

4.4.3 Estimated Settlements

We estimate total static settlement for foundations designed in accordance with the recommendations presented above and supported entirely on engineered fill or bedrock to be less than 1 inch.

4.4.4 Lateral Resistance

Lateral load resistance may be derived from passive resistance along the vertical sides of the foundations, friction acting at the base of the foundation, or a combination of the two. An allowable passive resistance of 250 psf per foot of depth may be used for design. Allowable passive resistance values should not exceed 2,500 psf. An allowable coefficient of friction value of 0.35 between the base of the foundations and the engineered fill soils and competent bedrock can be used for sliding resistance using the dead load forces. An allowable coefficient of friction value of 0.35 between the base of the level concrete pavement and the aggregate base can also be used for sliding resistance using the dead load forces. The pavement sliding friction should be reduced for sloping pavements based on the percentage slope. Friction and passive resistance may be combined without reduction. We recommend that the first foot of soil cover be neglected in the passive resistance calculations.

4.4.5 Lateral Earth Pressures

Design earth pressures for retaining walls depend primarily on the allowable wall movement, wall inclination, type of backfill materials, backfill slopes, surcharges, and drainage. The earth pressures provided assume that a non-expansive backfill will be used and a drainage system will be installed behind the walls, so that external water pressure will not develop. If a drainage system will not be installed, the wall should be designed to resist hydrostatic pressure in addition to the earth pressure.

The recommended active lateral earth pressures for horizontal backfills using granular relatively non-expansive soils on walls that are free to rotate at least 0.1 percent of the wall height is 35 pcf. The recommended active lateral earth pressures for wall backfills sloping not steeper than 2:1 using granular relatively non-expansive soils on walls that are free to rotate at least 0.1 percent of the wall height is 70 pcf.

The above lateral earth pressures do not include the effects of surcharges (e.g., traffic, footings), compaction, or truck-induced wall pressures. Any surcharge (live, including traffic, or dead load) located within a 1:1 plane drawn upward from the base of the excavation should be added to the lateral earth pressures. The lateral contribution of a uniform surcharge load located immediately behind walls may be calculated by multiplying the surcharge by 0.33 for cantilevered walls. Walls adjacent to areas subject to vehicular traffic should be designed for a

2-foot equivalent soil surcharge (240 psf). Lateral load contributions from other surcharges located behind walls may be provided once the load configurations and layouts are known.

4.5 SLOPE STABILITY

In order to reach the grades presented in the MWD Civil Drawings, bedrock cut slopes and engineered fill slopes are designed to be constructed. The proposed bedrock cut slopes up to approximately 25 feet are designed to be excavated to an inclination of 1.5:1 Horizontal:Vertical (H:V) and the fill slopes are designed at 2:1 H:V. We have performed preliminary analysis of the cut and fill slopes to evaluate the feasibility of the proposed slope inclinations. We recommend reevaluating, as needed, the proposed slopes once final plans are prepared.

4.5.1 Methodology

To evaluate the preliminary cut slopes, Kleinfelder completed limit-equilibrium slope stability analyses for the proposed cut slopes using the Slide software by RocScience Inc. (2016). Factors of safety (FOS) for the static and seismic screening analysis were established using Spencer's method. For the screening analysis, the horizontal seismic coefficient was developed using the procedure outlined in SP117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California. We performed a deaggregation based on a recurrence interval of 10 percent in 50 years to develop a design peak ground acceleration of 0.54g. Using the earthquake parameters above, the corresponding seismic coefficient (k_{eq}) is 0.18 for 6 inches (15 cm) of slope displacement.

4.5.2 Cut Slope Stability

We performed analysis on the bedrock cut slopes presented in Cross-Section F as shown on Sheet SK-5 of the MWD Civil Drawings dated February 2018 as well as Cross-Section C as shown on Sheet SK-15 of the MWD Civil Drawings dated April 2018. The parameters selected for the cut slope stability analysis are based on results of direct shear laboratory testing. The results of the laboratory testing are presented below in Table 2.

Table 2
Direct Shear Results and Slope Stability Parameters

Sample Number	Friction Angle (degrees)	Cohesion (psf)
B - 1 at 5 feet	30	150
B – 4 at 5 feet	30	250
B – 5 at 5 feet	41	350
Bedrock Strength Used in Stability Analysis	34	250

Based on the analyses completed, the FOS satisfy the City of Los Angeles minimum required FOS of 1.5 and 1.0 for the static and screening analysis, respectively as shown in Table 3.

Table 3
Bedrock Cut-Slope Stability Analysis Results

Maintenance Road	Analysis	Minimum Required FOS	Calculated FOS
Option 1	Static	1.50	1.54
	Screening	1.00	1.13
Option 2	Static	1.50	1.54
	Screening	1.00	1.18

Note: ¹The screening analysis was performed in accordance with SP117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California.

The direct shear testing presented in Table 2 was performed on Modified California-Type ring samples. Due to the sampling method and the brittle nature of the bedrock, the strength of the bedrock samples recovered is less than undisturbed intact samples. Although we performed the analysis using the parameters above, we also performed research of CGS Seismic Hazard Zone Report 05 to provide Mean Values for the Chatsworth Formation in the Oat Mountain 7.5-Minute Quadrangle. The Chatsworth Formation shear strength values are shown in Table 4 below and are significantly greater than the parameters included in our analysis.

Table 4
CDMG Published Strength Properties

Bedrock Unit	Mean Friction Angle (degrees)	Mean Cohesion (psf)
Chatsworth Formation	39.3	654

* CGS is formerly California Division of Mines and Geology (CDMG), Seismic Hazard Zone Report 05

4.5.3 Fill Slope Stability

The fill slopes are designed to be constructed at a gradient of 2:1 H:V or greater and do not require slope stability analysis per the current grading code. We anticipate that fill slopes constructed using engineered fill comprised of local materials and sloped at a maximum inclination of 2:1 will be stable

4.5.4 Construction of Permanent Fill Slopes

Fill slopes may be inclined up to 2:1 (horizontal:vertical) or flatter. Where the toe of a fill slope terminates on a natural or cut slope, a keyway is required at the toe of the fill slope. In general, fill slope keyways should be a minimum width of 15 feet, with a minimum depth of 3 feet into competent natural material, and should extend a distance equal to the depth of the keyway beyond the toe of the fill. Benching should be cut into the existing slope to bind the fill to the slope (see Figure 4).

Due to the limited height and configuration of the proposed fill slopes within the portion of the project, slope drains are not anticipated to be needed for this portion of the project. However, depending on fill slope construction and actual site conditions encountered in the field, back drains may be required within the compacted fill to prevent the buildup of hydrostatic pressures behind the fill slope. Field conditions, such as observed seepage from bedrock, or the presence of water within the slope may require the use of subdrains to adequately prevent buildup of hydrostatic pressures behind the fill slope. In general, fill slopes with design heights less than 10 feet will likely not require subdrains. Figures 4 presents standard slope drain details for fill slopes. Benches should be step-like in profile, with each bench not less than four feet in height and established in competent material. Compressible or other unsuitable soils should be removed from the slope prior to benching. Competent material is defined as being essentially free of loose soil, heavy fracturing or erosion prone material and is established by the

Geotechnical Consultant during grading. Following completion of the excavation for the keyway, the project Geotechnical Consultant shall observe the keyway prior to backfilling with certified engineered fill.

When constructing fill slopes the contractor shall avoid spillage of loose material down the face of the slope during dumping and rolling conditions. We recommend that the incoming load be dumped behind the face of the slope and bladed into place. We recommend that fill slopes greater than 10 feet in height should be over-built a minimum of 2 feet in thickness and then trimmed back to expose a compacted core, as shown in Figure 4. The over-built thickness may need to be increased to achieve the specified minimum compaction depending on the site conditions and geometry of the slope. For fill slopes less than 10 feet in height, after 4 feet of vertical height has been obtained, the contractor should compact the outer face of the slope by backing the tamping roller over the top of the slope and thoroughly covering the entire slope surface with overlapping passes of the roller. The foregoing should be repeated after the placement of each 4 foot thickness of fill. Fill slope surface should be compacted to a minimum of 90 percent relative compaction per ASTM D1557.

4.5.5 Construction of Permanent Cut Slopes

In general, cut slopes planned should have a maximum inclination of 1.5:1 (horizontal:vertical). We recommend that a qualified geologist be on site during grading of the cut slopes to map the exposed geology for consistency with the conditions presented in this report. If out-of-slope conditions or other geologic conditions differ from that anticipated then additional analysis and recommendations may be required including trimming the slope to the angle of bedding where practical. If site conditions do not allow trimming the slope to a flatter angle then the slope may need to be over-excavated and replaced with a buttress fill.

4.6 PAVEMENT SECTIONS

4.6.1 Asphalt-Concrete Pavement Sections

The required pavement structural sections will depend on the expected wheel loads, volume of traffic, and subgrade soils. The Traffic Indexes (TI's) assumed should be reviewed by the project Owner, Architect, and/or Civil Engineer to evaluate their suitability for this project. Changes in the TI's will affect the corresponding pavement section. The pavement subgrade should be prepared just prior to placement of the base course. Positive drainage of the paved areas should be provided since moisture infiltration into the subgrade may decrease the life of

pavements. The recommended asphalt pavement concrete recommendations are presented below in Table 5.

Table 5
Asphalt Concrete Pavement Sections
(Design R-value = 24)

Traffic Use	Assumed Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
General Roadway Minimum	--	3.0	4.0
Light Access Roadway Traffic	5.0	3.0	7.0

-- denotes minimum pavement thicknesses for flexible pavement design.

The R-value test result evaluated above was 24. We anticipate the final subgrade soils will consist of a blend of the upper and lower fill materials. Since the characteristics of the near-surface soils can change as a result of grading, we recommend that the subgrade soils be retested for pavement support characteristics, to confirm the parameters used in design and allow for a possible reduction in structural section thickness. Pavement sections provided above are contingent on the following recommendations being implemented during construction.

- The pavement sections recommended above should be placed on at least 24 inches of engineered fill compacted to at least 90 percent of maximum dry density with the upper 6 inches compacted to at least 95 percent relative compaction. The overexcavation of the pavement areas should be conducted as recommended in the earthwork section of this report. Prior to fill placement, the exposed subgrade should be scarified to a depth of 8 inches, uniformly moisture conditioned to near optimum moisture content.
- Subgrade soils should be in a stable, non-pumping condition at the time aggregate base materials are placed and compacted.
- Aggregate base materials should be compacted to at least 95 percent relative compaction.
- Adequate drainage (both surface and subsurface) should be provided such that the subgrade soils and aggregate base materials are not allowed to become wet.
- Aggregate base materials should meet current Caltrans specifications for Class 2 aggregate baserock (Class 2), or crushed miscellaneous base (CMB) as specified in "Standard Specifications for Public Work Construction" ("Greenbook").

- The asphalt pavement should be placed in accordance with “Green Book” specifications.
- All concrete curbs separating pavement and landscaped areas should extend into the subgrade and below the bottom of adjacent, aggregate base materials.

Pavement sections provided above are based on the soil conditions encountered during our field investigation, our understanding of the final site grades, and limited laboratory testing. Since the actual pavement subgrade materials exposed during grading may be significantly different than those tested for this study, we recommend that representative subgrade samples be obtained and additional R-value tests performed. Should the results of these tests indicate a significant difference, the design pavement section(s) provided above may need to be revised.

4.6.2 Portland Cement Concrete Pavement

Concrete pavements may be desirable along the alignment. The concrete pavement should have a minimum 28-day compressive strength of 3,000 psi or 4,000 psi as presented below. Control joints should be spaced at every 15 feet or as designed by the Civil Engineer. The concrete pavement section should be placed on at least 24 inches of engineered fill compacted to at least 90 percent of the maximum dry density. Prior to fill placement, the exposed subgrade should be prepared as recommended in Section 4.4 of this report. Table 6 below presents our recommendations of Portland Cement Concrete (PCC) pavement sections.

Table 6
Preliminary Recommended PCC Pavement Sections

Design R-value	Assumed Traffic Index	Concrete Thickness (inches; using a 28-day compressive strength of 3,000 psi)	Concrete Thickness (inches; using a 28-day compressive strength of 4,000 psi)
24	5	7.5	7.0

The PCC sections presented above may be decreased by 0.5 inches provided that they are constructed on 4 inches of Class 2 aggregate base or CMB compacted to 95% relative compaction. We recommend that the additional 4 inches of aggregate base described above should also underlain 24 inches of engineered fill compacted to at least 90 percent relative compaction. Our review of the MWD Civil Drawings presents details including a 9-inch PCC thickness, which is also acceptable for our understanding of the traffic loading conditions.

5 RECOMMENDED ADDITIONAL SERVICES

5.1 ADDITIONAL GEOTECHNICAL INVESTIGATION

Our authorized scope included limited geotechnical investigation. Conditions could vary between the locations explored. We do not anticipate encountering adverse bedding conditions during grading. However, if adverse bedding conditions are encountered, redesign of proposed slopes may be necessary resulting in delays during construction. To reduce the risk of construction delays, confirmation borings could be excavated through the top of each proposed cut slope prior to construction. Kleinfelder can provide a proposal for additional scope and fee if this option is desired. A geotechnical representative should be retained to provide full-time observation and geologic mapping during construction of all slopes constructed for this project.

5.2 PLANS AND SPECIFICATIONS REVIEW

We recommend that Kleinfelder perform a general review of the project plans and specifications before they are finalized to verify that our geotechnical recommendations have been properly interpreted and implemented during design. If we are not accorded the privilege of performing this review, we can assume no responsibility for misinterpretation of our recommendations.

5.3 CONSTRUCTION OBSERVATION AND TESTING

The construction process is an integral design component with respect to the geotechnical aspects of a project. Because geotechnical engineering is an inexact science due to the variability of natural processes, and because we sample only a limited portion of the soils affecting the performance of the proposed structure, unanticipated or changed conditions can be encountered during grading. Proper geotechnical observation and testing during construction are imperative to allow the geotechnical engineer the opportunity to verify assumptions made during the design process. Therefore, we recommend that Kleinfelder be retained during the construction of the proposed improvements to observe compliance with the design concepts and geotechnical recommendations, and to allow design changes in the event that subsurface conditions or methods of construction differ from those assumed while completing this study.

Our services are typically needed at the following stages of grading.

- after demolition;
- during grading;
- after the overexcavation, but prior to scarification;
- during utility trench backfill;
- during base placement and site paving; and
- after excavation for foundations.

6 LIMITATIONS

This geotechnical study has been prepared for the exclusive use by Metropolitan Water District (Client) and their agents for specific application to the project in Chatsworth, California. The findings, conclusions and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No other warranty, express or implied, is made.

The scope of services was limited to a background data review and the field exploration described in the Scope of Services section. It should be recognized that definition and evaluation of subsurface conditions are difficult. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. The conclusions of this assessment are based on our field exploration and laboratory testing programs, and engineering analyses.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service, which provide information for their purposes at acceptable levels of risk. The client and key members of the design team should discuss the issues covered in this report with Kleinfelder, so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk and expectations for future performance and maintenance.

Recommendations contained in this report are based on our field observations and subsurface explorations, limited laboratory tests, and our present knowledge of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Kleinfelder is notified immediately so that we may reevaluate the recommendations of this report. If the scope of the proposed construction, including the locations of the improvements, changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed, and the conclusions of this report are modified or approved in writing, by Kleinfelder.

The scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

Kleinfelder cannot be responsible for interpretation by others of this report or the conditions encountered in the field. Kleinfelder must be retained so that all geotechnical aspects of construction will be monitored on a full-time basis by a representative from Kleinfelder, including site preparation, preparation of foundations, and placement of engineered fill and trench backfill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, Kleinfelder must also be retained to perform a supplemental evaluation and to issue a revision to our original report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinion, recommendations, or conclusions contained in the report. Because of the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder's geotechnical engineer can be contacted to confirm those conditions. We recommend the contractor describe the nature and extent of the differing conditions in writing and that the construction contract include provisions for dealing with differing conditions. Contingency funds should be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land use, site conditions (both on site and off site) or other factors may change over time, and additional work may be required with the passage of time. Any party, other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of this report and the nature of the new project, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and the client agrees to defend, indemnify, and hold harmless Kleinfelder from any claims or liability associated with such unauthorized use or non-compliance.

7 REFERENCES

- American Concrete Institute (ACI), 2002, Building Code Requirements for Structural Concrete (ACI 318-02) and Commentary (ACI 318R-02).
- American Society of Civil Engineers (ASCE), 2010, Minimum Design Load for Buildings and Other Structures (ASCE/SEI 7-10).
- Barrows, A.G., Kahle, J.E., Saul, R.B., and Weber, F.H., Jr., 1975, Geologic map of the San Fernando earthquake area, *in* Oakeshott, G.B., ed., San Fernando, California, earthquake of 9 February 1971.
- Bryant, William A., Hart, Earl W., 2007, Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Map, Interim Revision 2007.
- California Department of Transportation (Caltrans), 2017, Highway Design Manual.
- California Division of Mines and Geology Bulletin 196, Pl. 2, scale 1:18,000.
- California Division Of Mines and Geology (CDMG), 1997, Seismic Hazard Zone Report for the Oat Mountain 7.5 Minute Quadrangle, Los Angeles County, California, Seismic Hazard Zone Report 05.
- California Geological Survey (CGS), 2002, *California Geomorphic Provinces*, Note 36.
- California Geological Survey (CGS), 2017, Earthquake Fault Zones and Seismic Hazard Zones, Oat Mountain 7.5 Minute Quadrangle, Earthquake Zones of Required Investigation Oat Mountain Quadrangle, scale 1: 24,000.
- Cilona, A., Aydin, A., Likerman, J., Parker, B., and Cherry, J., 2016, Structural and statistical characterization of joints and multi-scale faults in an alternating sandstone and shale turbidite sequence at the Santa Susana Field Laboratory: Implications for their effects on groundwater flow and contaminate transport, in *Journal of Structural Geology*, Volume 85, April 2016, pages 95-114.

FEMA, 2008, Flood Insurance Rate Map (FIRM) Los Angeles County, California and Incorporated Areas, ([Panel 1040 of 2350 Map Number 06037C1040F](#)) effective date September 26, 2008.

Geological Society of America, 2011, Structure of the San Fernando Valley Region, California: Implications for seismic hazard and tectonic history, Lanhenheim, V.E. et al., *Geosphere*, 7(2):528.

International Code Council, Inc., 2016 California Building Code.

Link, M.H., Squires, R.L. and Colburn, I. P., 1984, Upper Cretaceous Chatsworth Formation, Simi Hills, California, *AAPG Bulletin* (1984) 68 (7): 850-873. Published: July 01, 1984.

Metropolitan Water District (2018), MWD Civil Drawings, Distribution System, West Valley Feeder No 1, Valve Modifications Stage 3, Chatsworth Park, Sheets SK-1 through SK-7, February, 2018.

Norris, R. M., and Webb, R. W., 1990, *Geology of California*, second edition New York, John Wiley & Sons.

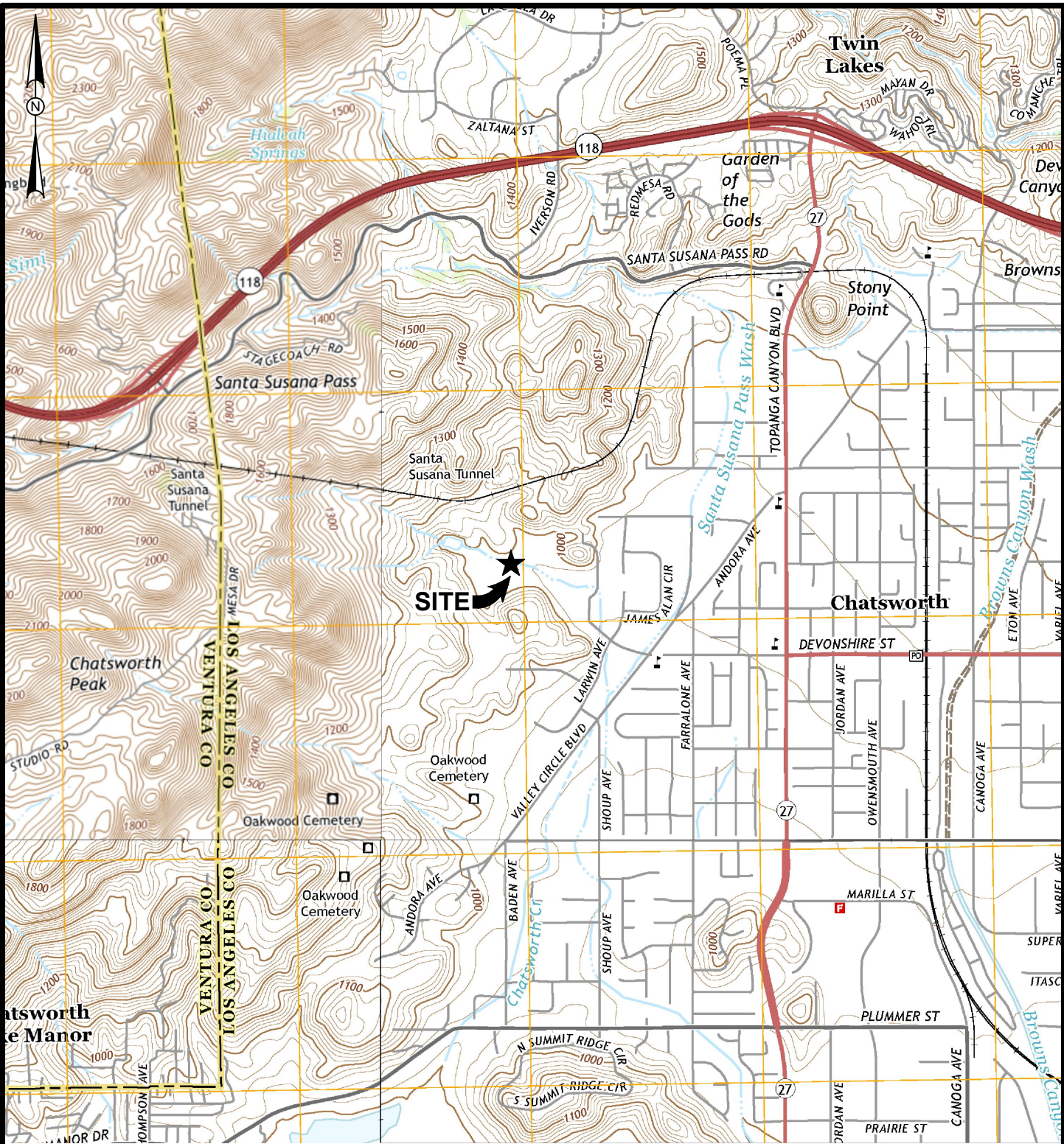
Rocscience, 2016, Slide 7.020 64-bit, Computer Software for the Analysis of Slope Stability.

Treiman, J.A., compiler, 2000, Fault number 105a, Sierra Madre fault zone, Santa Susana section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, <https://earthquakes.usgs.gov/hazards/qfaults>, accessed 03/06/2018 02:34 PM.

United States Geological Survey (USGS), 2014, Preliminary Geologic Map of the Los Angeles 30' x 60' Quadrangle, California, Version 2.1, Compiled by R.H. Campbell, C.J. Wills, P.J. Irvine, and B.J. Swanson, scale 1:100,000.

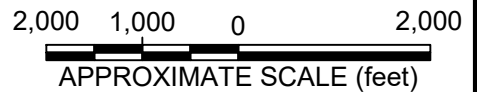
Yerkes, R.F. and Campbell, R.H., 1997, Preliminary Geologic map of the Oat Mountain 7.5' Quadrangle, Southern California: A Digital Database: U.S. Geological Survey, compiled by R.F. Yerkes and R. H. Campbell, Open-File Report 95-089, <https://pubs.usgs.gov/of/1995/of95-089/>.

FIGURES



SOURCE: U.S.G.S. 7.5' Topographic series, Oat Mountain, California Quadrangle 2015.

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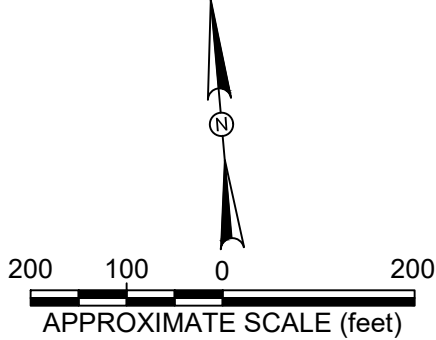
SITE VICINITY MAP
WEST VALLEY FEEDER 1 VALVE IMPROVEMENTS
CHATSWORTH, CALIFORNIA

FIGURE
1



EXPLANATION

- B-5 APPROXIMATE BORING LOCATION
- LINE 2 APPROXIMATE SEISMIC REFRACTION LINE LOCATION
- APPROXIMATE LOCATION OF ACCESS ROAD ALIGNMENT OPTION 1
- APPROXIMATE LOCATION OF ACCESS ROAD ALIGNMENT OPTION 2

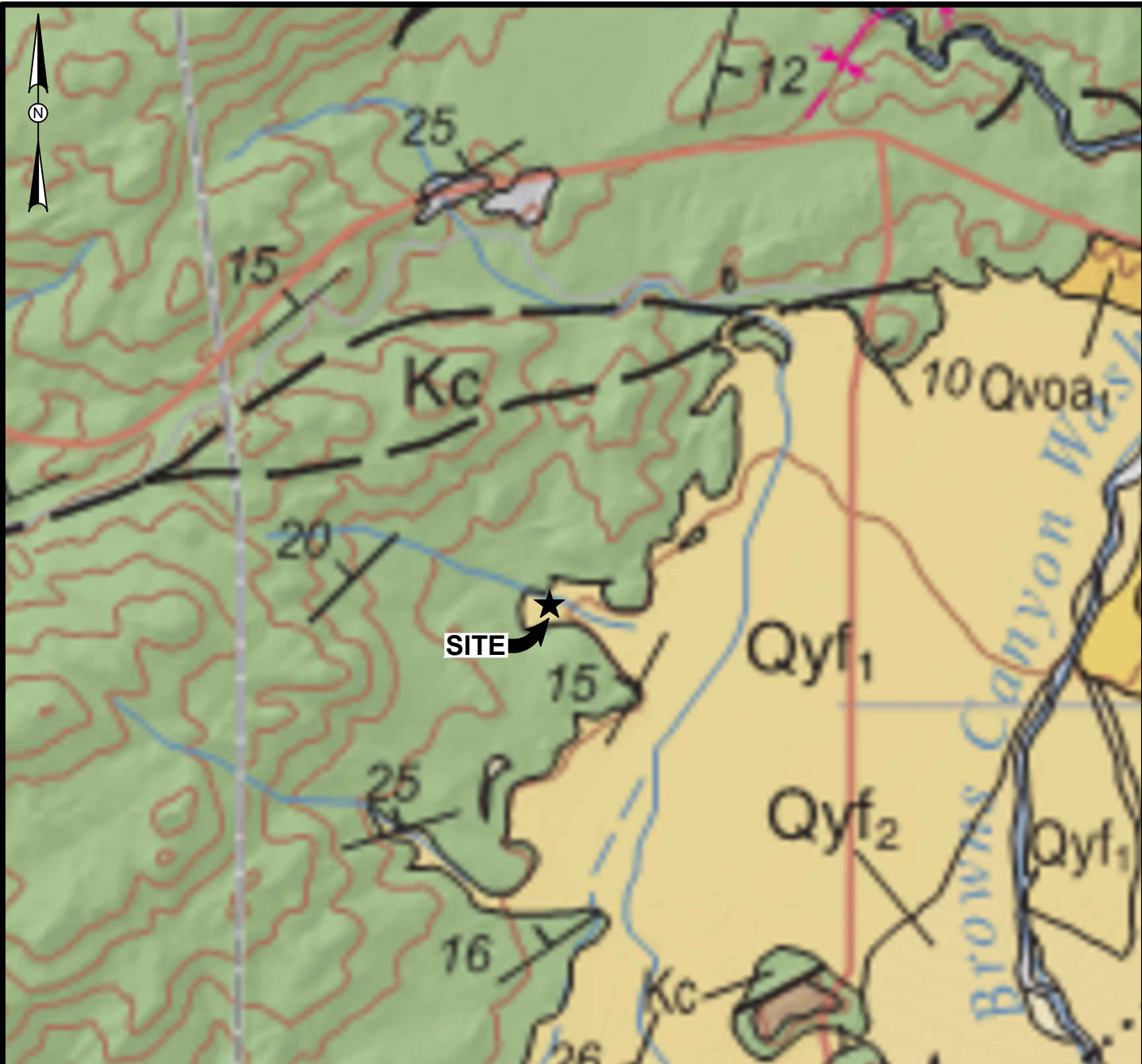


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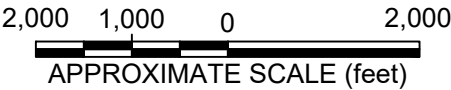


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FIELD EXPLORATION LOCATION MAP
WEST VALLEY FEEDER 1 VALVE IMPROVEMENTS CHATSWORTH, CALIFORNIA



SOURCE: PRELIMINARY GEOLOGIC MAP OF THE LOS ANGELES 30'x60' QUADRANGLE, CALIFORNIA
VERSION 2.1 COMPILED BY RUSSELL H. CAMPBELL, CHRIS J. WILLIS, PAMELA J. IRVINE,
AND BRIAN J. SWANSON, 2014



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EXPLANATION

Qyf ₂	YOUNG ALLUVIAL FAN DEPOSITS, UNIT 2
Qyf ₁	YOUNG ALLUVIAL FAN DEPOSITS, UNIT 1
Qvoa	VERY OLD ALLUVIUM, UNDIVIDED
Tm	RINCON FORMATION, MARINE SHALE AND MUDSTONE
Kc	CHATSWORTH FORMATION



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REGIONAL GEOLOGIC MAP

WEST VALLEY FEEDER 1 VALVE IMPROVEMENTS
CHATSWORTH, CALIFORNIA

FIGURE

3



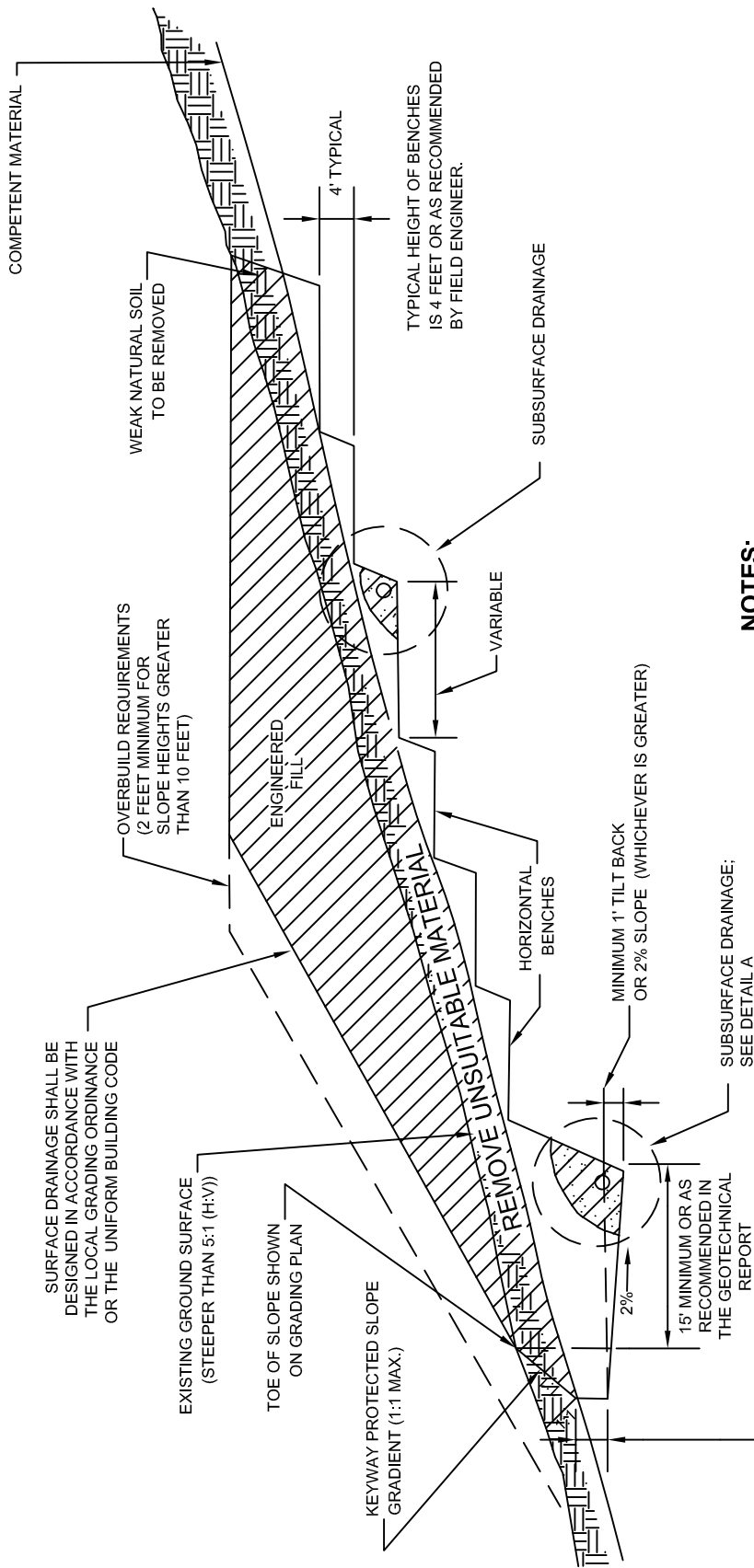
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**TYPICAL ENGINEERED
FILL SLOPE/BENCHING DETAIL**

WEST VALLEY FEEDER 1 VALVE IMPROVEMENTS
CHATSWORTH, CALIFORNIA

FIGURE

4

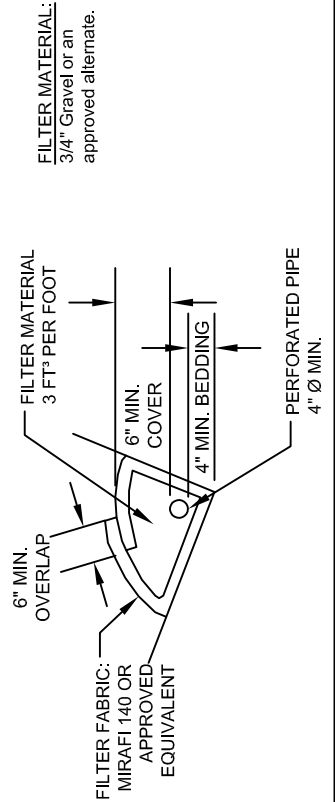


NOTES:

1. FINAL BENCHING AND KEYWAY EXCAVATION DEPTHS AND DETAILS SUBJECT TO EVALUATION OF FIELD CONDITIONS.
2. DIMENSIONS AND LOCATIONS OF SUB DRAINAGE ARE APPROXIMATE. ACTUAL INSTALLATION TO BE BASED ON FIELD CONDITIONS.
3. GRADE PIPES TO DRAIN TO AN APPROPRIATE DISCHARGE FACILITY.
4. INSTALL CLEANOUTS AT ENDS, ANGLES, AND JUNCTIONS OF PIPE.
5. BENCH SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE SOIL ENGINEER.
6. SUBDRAINAGE: BACK DRAIN REQUIRED AS RECOMMENDED IN THE GEOTECHNICAL REPORT AND VERIFIED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT

DETAIL A:

PERFORATED PIPE SURROUNDED BY FILTER MATERIAL



APPENDIX A

Field Explorations

APPENDIX A

FIELD EXPLORATIONS

The subsurface exploration program for the proposed project consisted of advancing and logging a total of 5 hollow-stem auger borings. The borings were drilled with a limited access track drill rig equipped with 8-inch diameter hollow-stem augers, provided by 2R Drilling of Chino, California. The approximate locations of the borings are shown on Figure 2, Field Exploration Location Map.

The logs of the borings are presented on Figures A-3 through A-7. An explanation to the logs is presented on Figures A-1 and A-2, Soil Description Key and Graphics Key, respectively. The logs of borings present a description of the earth materials encountered, samples obtained, and show field and laboratory tests performed. The logs also show the boring number, drilling date, boring elevation and the name of the logger and drilling subcontractor. A Kleinfelder staff professional logged the borings utilizing the Unified Soil Classification System. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers and/or bedrock may be gradual. Bulk and drive samples of representative earth materials were obtained from the borings at maximum intervals of approximately 5 feet. With the exception of Boring B-3, the excavated soil cuttings were used to backfill the excavations. In Boring B-3, the boring was backfilled with cement/bentonite grout.

A California sampler was used to obtain relatively undisturbed drive samples of the soil encountered. This sampler consists of a 3 inch O.D., 2.5 inch I.D. split barrel shaft that is driven a total of 18 inches into the soil at the bottom of the boring. The soil was retained in six 1-inch brass rings for laboratory testing. The sampler was driven using a 140-pound automatic hammer falling 30 inches. The total number of hammer blows required to drive the sampler the final 12 inches is termed the blow count and is recorded on the Logs of Borings. Where the sample was driven less than 12 inches, the number of blows to drive the sample for each 6-inch segment, or portion thereof, is shown on the logs.

Bulk samples of the sub-surface soils were directly retrieved from the soil cuttings produced by the auger blades.

SAMPLER AND DRILLING METHOD GRAPHICS

	BULK / GRAB / BAG SAMPLE
	MODIFIED CALIFORNIA SAMPLER (2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)
	CALIFORNIA SAMPLER (3 in. (76.2 mm.) outer diameter)
	STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)
	HQ CORE SAMPLE (2.500 in. (63.5 mm.) core diameter)
	SHELBY TUBE SAMPLER
	HOLLOW STEM AUGER
	SOLID STEM AUGER
	WASH BORING
	SONIC CONTINUOUS SAMPLER

GROUND WATER GRAPHICS

	WATER LEVEL (level where first observed)
	WATER LEVEL (level after exploration completion)
	WATER LEVEL (additional levels after exploration)
	OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS

WOH - Weight of Hammer
 WOR - Weight of Rod

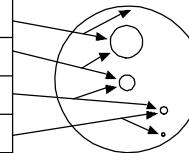
UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

GRAVELS (More than half of coarse fraction is larger than the #200 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		Cu < 4 and/or 1 > Cc > 3		GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
	GRAVELS WITH 5% TO 12% FINES	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW-GM	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		Cu < 4 and/or 1 > Cc > 3		GP-GM	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
	GRAVELS WITH > 12% FINES			GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		Cu < 6 and/or 1 > Cc > 3		SP	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
	SANDS WITH 5% TO 12% FINES	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW-SM	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		Cu < 6 and/or 1 > Cc > 3		SP-SM	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
	SANDS WITH > 12% FINES			SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)			ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	SILTS AND CLAYS (Liquid Limit greater than 50)			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

 Bright People. Right Solutions.	PROJECT NO.: 20174481	GRAPHICS KEY West Valley Feeder 1 Valve Improvements Chatsworth, CA	FIGURE A-1
	DRAWN BY: CC CHECKED BY: JW DATE: 3/1/2018 REVISED: -		

GRAIN SIZE

DESCRIPTION	SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders	>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles	3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse 3/4 - 3 in. (19 - 76.2 mm.)	3/4 - 3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine #4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse #10 - #4	0.075 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium #40 - #10	0.017 - 0.075 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine #200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines	Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller

**SECONDARY CONSTITUENT**

	AMOUNT	
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N ₆₀ (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q _u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25 ≤ PP < 0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5 ≤ PP < 1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1 ≤ PP < 2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2 ≤ PP < 4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4 ≤ PP	>8000	Thumbnail will not indent soil.

FROM TERZAGHI AND PECK, 1948; LAMBE AND WHITMAN, 1969; FHWA, 2002; AND ASTM D2488

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT-N ₆₀ (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.



PROJECT NO.: 20174481
 DRAWN BY: CC
 CHECKED BY: JW
 DATE: 3/1/2018
 REVISED: -


SOIL DESCRIPTION KEY

West Valley Feeder 1 Valve Improvements
 Chatsworth, CA

FIGURE

A-2

Date Begin - End: 1/30/2018	Drilling Company: 2R Drilling	BORING LOG B-1
Logged By: C.Coffey	Drill Crew: Jeff	
Hor.-Vert. Datum: Not Available	Drilling Equipment: CME-75 Track Mounted	Hammer Type - Drop: 140 lb. Auto - 30 in.
Plunge: -90 degrees	Drilling Method: Hollow Stem Auger	
Weather: Party Cloudy/Mid 80s	Exploration Diameter: 8 in. O.D.	

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 1,034.00 Surface Condition: Gravel	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
															Lithologic Description
			Fill Silty SAND (SM): fine-grained, pale olive brown, dry, some medium sand, subangular												hand auger to 0.5 feet, refusal at 0.5 feet due to very dense soil/bedrock
			Bedrock: Chatsworth Fm. (Kc) SANDSTONE: fine to medium-grained, yellowish brown (10YR-3/6), dry to moist, very dense, excavates as silty sand (SM) with gravel with fine to medium gravel (0.5 to .75 inch)		BC=50/2"			3.6	104.3						
1030	5														
					BC=50/5"										direct shear test
1025	10		excavates as silty sand (SM), fine grained, some fine gravel, subangular, slightly friable												hard drilling
					BC=50/1"			4.4	104.4						
			The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with soil on January 30, 2018.												
			<u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion. <u>GENERAL NOTES:</u> The exploration location and elevation are approximate and were estimated by Kleinfelder.												
1020	15														
1015	20														
1010															

Date Begin - End: 1/30/2018	Drilling Company: 2R Drilling	BORING LOG B-2
Logged By: C.Coffey	Drill Crew: Jeff	
Hor.-Vert. Datum: Not Available	Drilling Equipment: CME-75 Track Mounted	
Plunge: -90 degrees	Drilling Method: Hollow Stem Auger	
Weather: Party Cloudy/Mid 80s	Exploration Diameter: 8 in. O.D.	
Hammer Type - Drop: 140 lb. Auto - 30 in.		

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								Additional Tests/Remarks
			Approximate Ground Surface Elevation (ft.): 1,018.00 Surface Condition: Asphalt	Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	
				Asphalt: 3-inches Base: 8-inches Alluvium Silty SAND (SM): fine-grained, dark yellowish brown (10YR-3/8), dry to moist, some medium sand, subangular to angular					7.0						Hand auger to 5 feet
1015				Bedrock: Chatsworth Fm. (Kc) SANDSTONE: fine-grained, yellowish brown (10YR 3/4) to very dark brown (10YR-2/2), moist, very dense, excavates as well-graded sand with silt (SW-SM)											corrosion test
	5					BC=7 50/5"		SP-SM	12.2	114.2	100	11			
1010				yellowish brown (10YR-3/4), excavates as silty sand (SM)											hard drilling
	10					BC=50/3"									
1005															
	15			fine to medium-grained, light brownish gray (10YR-6/4), excavates as poorly graded sand with Gravel (SP), fine to medium (up to 1.5-inch) angular gravel		BC=50/2"									
1000															
	20														
995															

The boring was terminated at approximately 16.5 ft. below ground surface. The boring was backfilled with soil on January 30, 2018.

GROUNDWATER LEVEL INFORMATION:

Groundwater was not observed during drilling or after completion.

GENERAL NOTES:

The exploration location and elevation are approximate and were estimated by Kleinfelder.



PROJECT NO.: 20174481
DRAWN BY: CC
CHECKED BY: JW
DATE: 3/1/2018
REVISED: -

BORING LOG B-2

West Valley Feeder 1 Valve Improvements
Chatsworth, CA

FIGURE


A-4




KLEINFELDER
Bright People. Right Solutions.

Date Begin - End: 1/30/2018		Drilling Company: 2R Drilling		BORING LOG B-4									
Logged By: C.Coffey		Drill Crew: Jeff											
Hor.-Vert. Datum: Not Available		Drilling Equipment: CME-75 Track Mounted		Hammer Type - Drop: 140 lb. Auto - 30 in.									
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger											
Weather: Party Cloudy/Mid 80s		Exploration Diameter: 8 in. O.D.											

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS									
			Approximate Ground Surface Elevation (ft.): 1,021.00 Surface Condition: Soil	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks		
															Lithologic Description	
1020		Alluvium	Sandy Lean CLAY (CL): low plasticity, dark yellowish brown (10YR-3/4), dry, fine sand						6.4		100	58				Hand auger to 5 feet, medium to hard hand augering
5		Bedrock: Chatsworth FM (Kc)	SANDSTONE: fine-grained, very pale brown (10YR-7/4), dry, very dense, excavates as silty sand (SM), slightly friable	BC=26 34 40												direct shear test
1015																
10									6.0	111.2						
1010				BC=50/5"												
15																
1005				BC=50/2"												
<p>The boring was terminated at approximately 16.5 ft. below ground surface. The boring was backfilled with soil on January 30, 2018.</p> <p>GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion.</p> <p>GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.</p>																

 KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20174481	BORING LOG B-4		FIGURE
	DRAWN BY: CC	West Valley Feeder 1 Valve Improvements Chatsworth, CA		A-6
	CHECKED BY: JW			
DATE: 3/1/2018				
REVISED: -				
PAGE: 1 of 1				

Date Begin - End: 1/30/2018	Drilling Company: 2R Drilling	BORING LOG B-5
Logged By: C.Coffey	Drill Crew: Jeff	
Hor.-Vert. Datum: Not Available	Drilling Equipment: CME-75 Track Mounted	Hammer Type - Drop: 140 lb. Auto - 30 in.
Plunge: -90 degrees	Drilling Method: Hollow Stem Auger	
Weather: Party Cloudy/Mid 80s	Exploration Diameter: 8 in. O.D.	

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 1,116.00 Surface Condition: Soil	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
															Lithologic Description
1115			Fill Poorly Graded SAND with Silt (SP-SM): fine-grained, dark yellowish brown (10YR-4/4), dry, dense, moderately cemented					6.4							hand auger to 0.5 feet, hand auger refusal at 0.5 feet due to dense bedrock/sandstone
			Bedrock: Chatsworth Fm. (Kc) SANDSTONE: dark yellowish brown (10YR-4/4), very dense, excavates as silty sand with gravel (SM)	BC=16 22 30				6.1	118.3	79	17				compaction test R-Value test
	5			BC=8 12 50/5"											
1110															
	10		weakly cemented, increase in fines	BC=50/3"				5.8	98.0						
1105															hard drilling
	15		excavates as silty sand (SM), moderately cemented	BC=50/2"											disturbed sample
1100															
	20		moderately cemented	BC=50/2"											disturbed sample
1095															

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with soil on January 30, 2018.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.

APPENDIX B

LABORATORY TESTING

GENERAL

Laboratory tests were performed on selected samples as an aid in classifying the soils and to evaluate physical properties of the soils that may affect foundation design and construction procedures. The tests were performed in general conformance with the current ASTM or California Department of Transportation (Caltrans) standards. A description of the laboratory-testing program is presented below.

Laboratory tests were performed on representative relatively undisturbed and bulk soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with one of the following references:

1. Lambe, T. William, Soil Testing for Engineers, Wiley, New York, 1951.
2. Laboratory Soils Testing, U.S. Army, Office of the Chief of Engineers, Engineering Manual No. 1110-2-1906, November 30, 1970.
3. ASTM Standards for Soil Testing, latest revisions.
4. State of California Department of Transportation, Standard Test Methods, latest revisions.

LABORATORY MOISTURE AND DENSITY DETERMINATIONS

Natural moisture content and dry density tests were performed on selected soil samples collected. Moisture content was evaluated in general accordance with ASTM Test Method D 2216; dry unit weight was evaluated using procedures similar to ASTM Test Method D 2937. The results are presented on the Logs of Borings and are summarized in Table B-1, Moisture Content and Unit Weight.

SIEVE AND HYDROMETER ANALYSIS

Sieve analyses were performed on four samples and Hydrometer Analysis was performed on one sample of the materials encountered at the site to evaluate the grain size distribution characteristics of the soils and to aid in their classification. The tests were performed in general

accordance with ASTM Test Method D 422. The test results are presented as Figures B-1 and B-2, Grain Size Distribution Curve.

DIRECT SHEAR

Direct shear testing was conducted on five samples to evaluate the shear strength parameters of representative on-site soils. The samples from B-1 and B-5 was taken from a bulk sample and remolded to 90% relative compaction for the test. Each sample was tested in a saturated state in general accordance with ASTM Test Method D3080-90. The test results are presented on Figure B-3 through B-7, Direct Shear Test.

EXPANSION INDEX

Expansion index testing was performed on a sample of the subsurface soils to evaluate their expansion characteristics. The test was performed in accordance with UBC Standard No. 18-2, Expansion Index Test Method. The test result is presented on Table B-2, Expansion Index Test Result and may be compared to the table presented below to qualitatively evaluate the expansion potential of the near-surface site soils.

<u>Expansion Index</u>	<u>Potential Expansion</u>
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

MAXIMUM DENSITY/OPTIMUM MOISTURE TEST

Four maximum density/optimum moisture tests were performed on select bulk samples of the on-site soils to determine compaction characteristics. The tests were performed in accordance with ASTM Standard Test Method D-1557-91. The test results are presented in Table B-3, Maximum Density / Optimum Moisture Test Results.

R-VALUE TEST

Three resistance value (R-value) tests were performed to evaluate support characteristics of the near-surface onsite soils. R-value testing was performed in accordance with Caltrans Standard Test Method 301. The test results are presented in Table B-4, R-Value Test Results.

PRELIMINARY CORROSIVITY TESTS

A series of chemical tests were performed on two representative soil samples collected from the borings to estimate pH, sulfate content, chloride content, and electrical resistivity. The test results may be used by a qualified corrosion engineer to evaluate the general corrosion potential with respect to the construction materials. The results of the tests are presented in Table B-5, Preliminary Corrosion Test Results.

Table B-1
Moisture Content and Unit Weight

Boring	Depth (ft)	Moisture Content (%)	Dry Unit Weight (pcf)
B-1	2	3.6	104.3
B-1	10	4.4	104.4
B-2	0 – 5	7.0	--
B-2	5	12.2	114.2
B-2	10	10.1	106.3
B-3	0 – 5	6.3	--
B-3	2	6.7	113.3
B-3	5	5.0	104.9
B-4	0 – 5	6.4	--
B-4	10	6.0	111.2
B-5	0 – 5	6.4	--
B-5	2	6.1	118.3
B-5	10	5.8	98.0

-- denotes dry unit weight test was not performed due to sample type

Table B-2
Expansion Index Test Result

Boring	Depth (ft)	Expansion Index	Expansion Potential
B-4	0 – 5	56	Medium

Table B-3
Maximum Density/Optimum Moisture Test Results

Boring	Depth (ft)	Maximum Density (pcf)	Optimum Moisture (%)
B – 1	0 – 5	128.6	8.2
B – 5	0 – 5	130.3	8.2

Table B-4
R-Value Test Results

Boring	Approximate Depth (ft)	R-Value
B – 3	0 – 5	19
B – 5	0 – 5	29

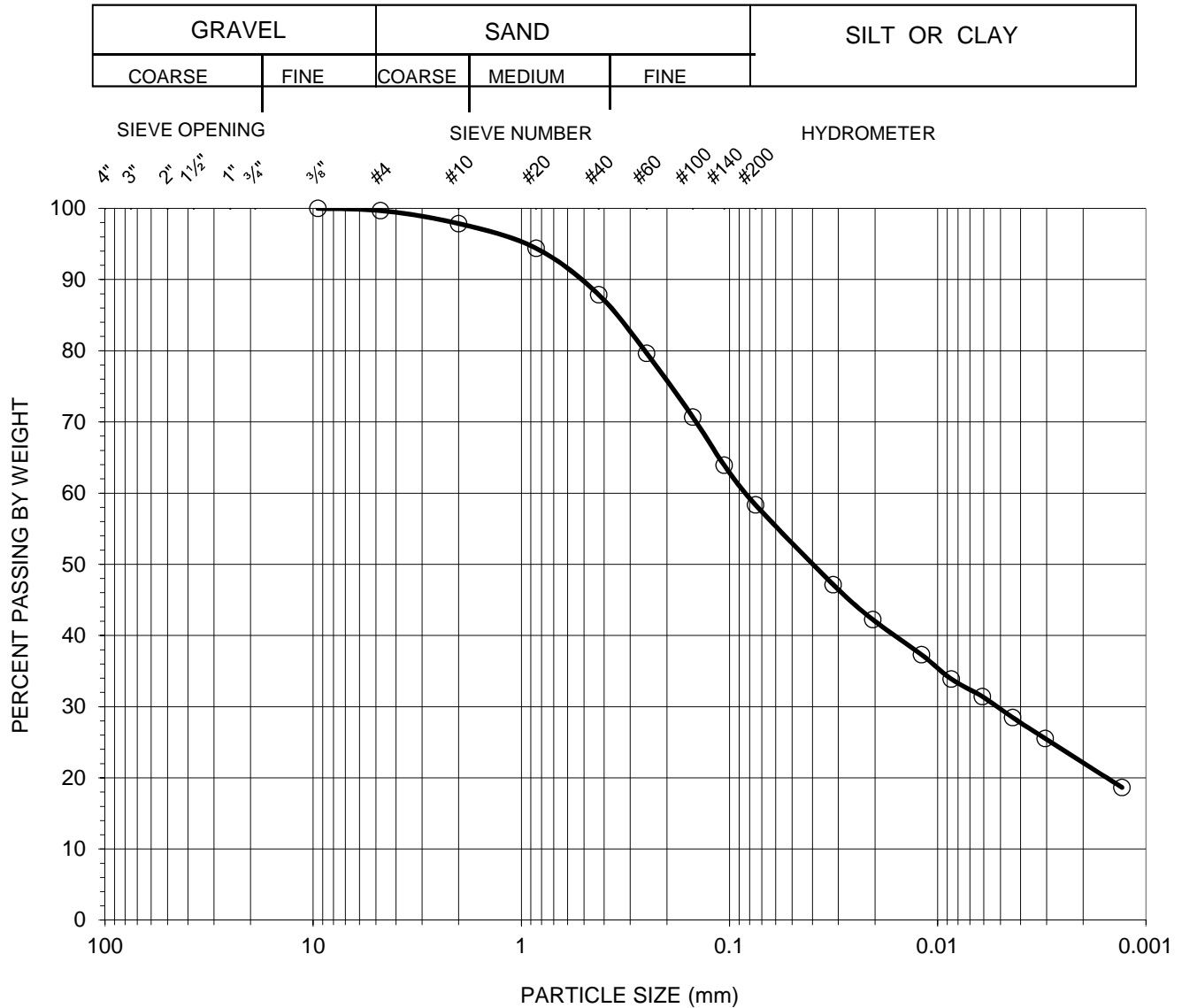
Table B-5
Preliminary Corrosion Test Results

Boring	Depth (ft)	pH	Sulfate (ppm)	Chloride (ppm)	Resistivity (ohm-cm)
B – 2	0 – 5	8.3	1981	55	48



GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913 & D 7928

Client Name: Kleinfelder Tested by: JT Date: 02/09/18
Project Name: Municipal Water District - West Valley Feeder Computed by: JP Date: 02/09/18
Project Number: 20180213.002A Checked by: AP Date: 02/09/18



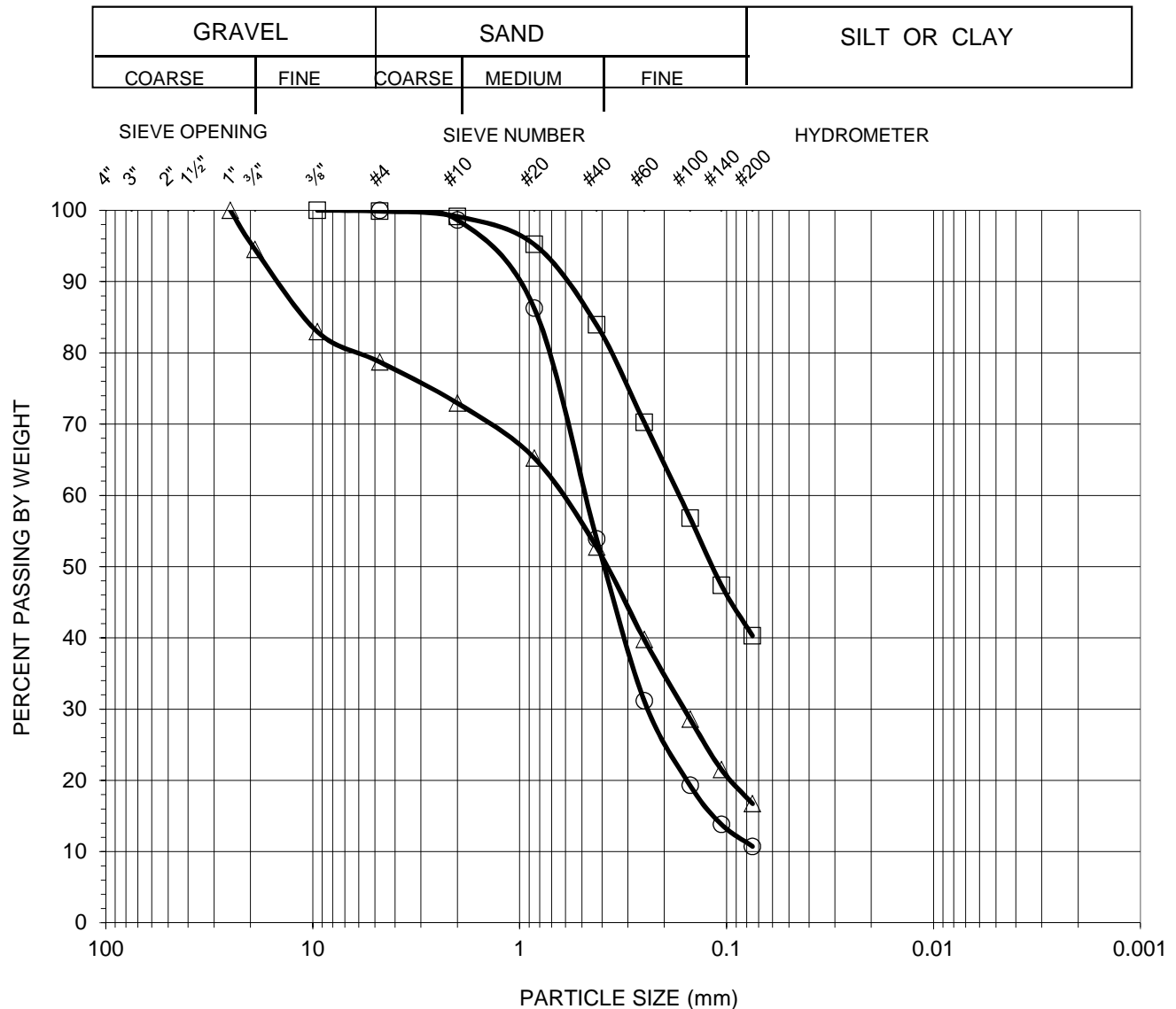
Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	B-4	1	0-5	0	42	58	N/A	CL*

*Note: Based on visual classification of sample



GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name: Kleinfelder Tested by: JT Date: 02/09/18
Project Name: Municipal Water District - West Valley Feeder Computed by: JP Date: 02/09/18
Project Number: 20180213.002A Checked by: AP Date: 02/09/18



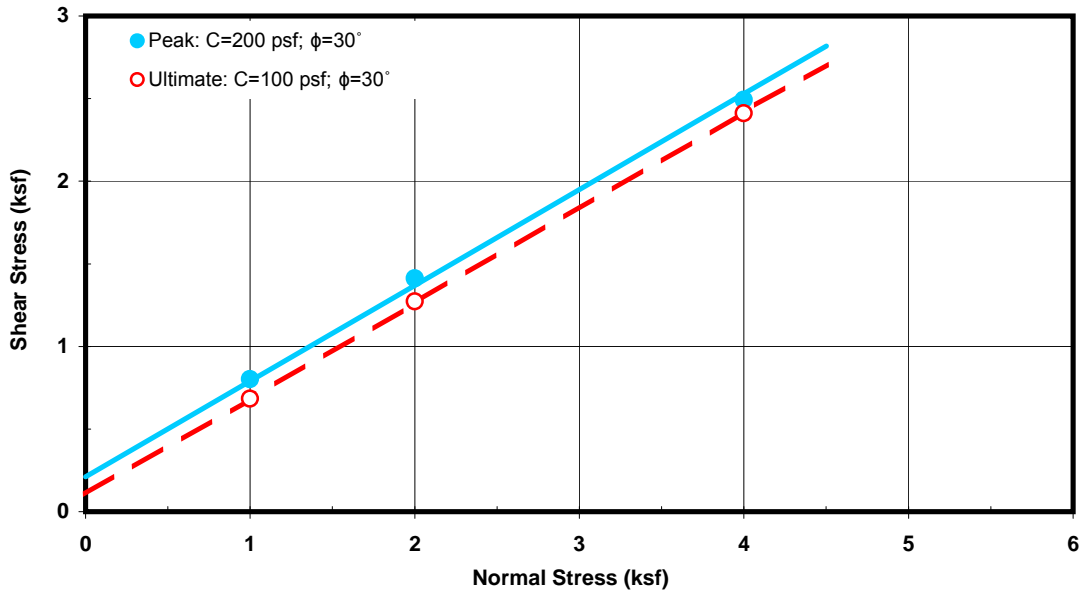
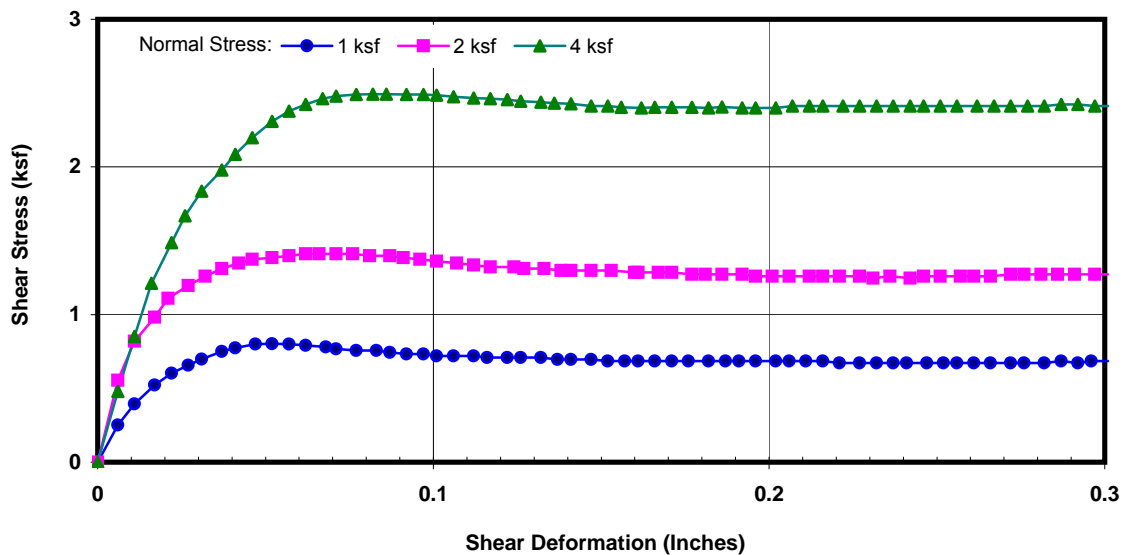


DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name: Municipal Water District - West Valley Feeder
Project No.: 20180213.002A
Boring No.: B-1
Sample No.: 1 Depth (ft): 0-5
Sample Type: Remolded to 90% RC at opt. MC
Soil Description: Silty Sand
Test Condition: Inundated Shear Type: Regular

Tested By: LS Date: 02/26/18
Computed By: JP Date: 02/27/18
Checked by: AP Date: 02/27/18

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
125.6	115.7	8.5	15.3	50	90	1	0.802	0.684
						2	1.411	1.273
						4	2.493	2.412



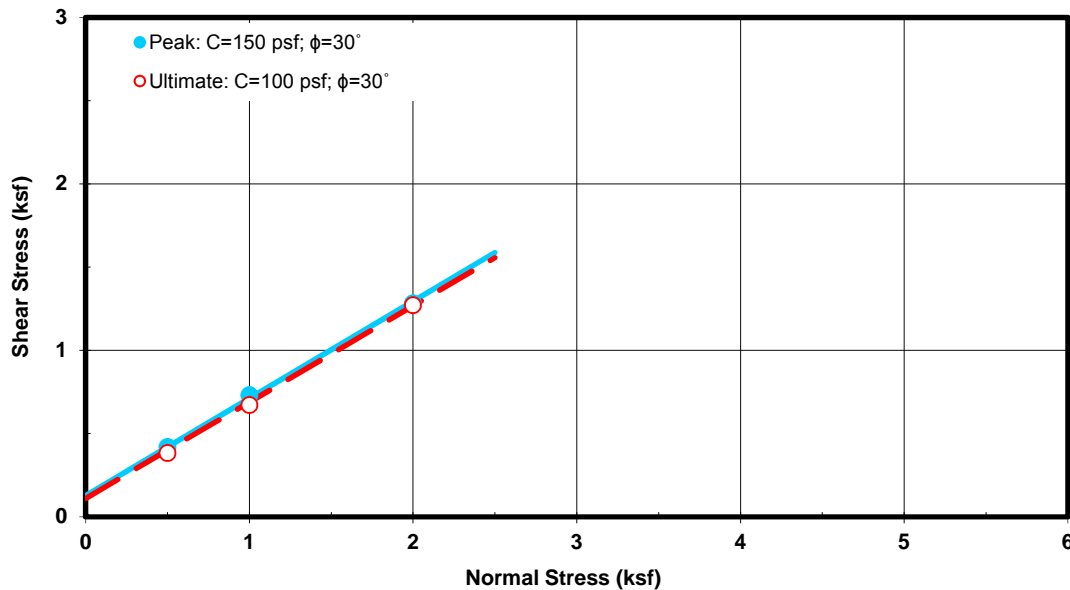
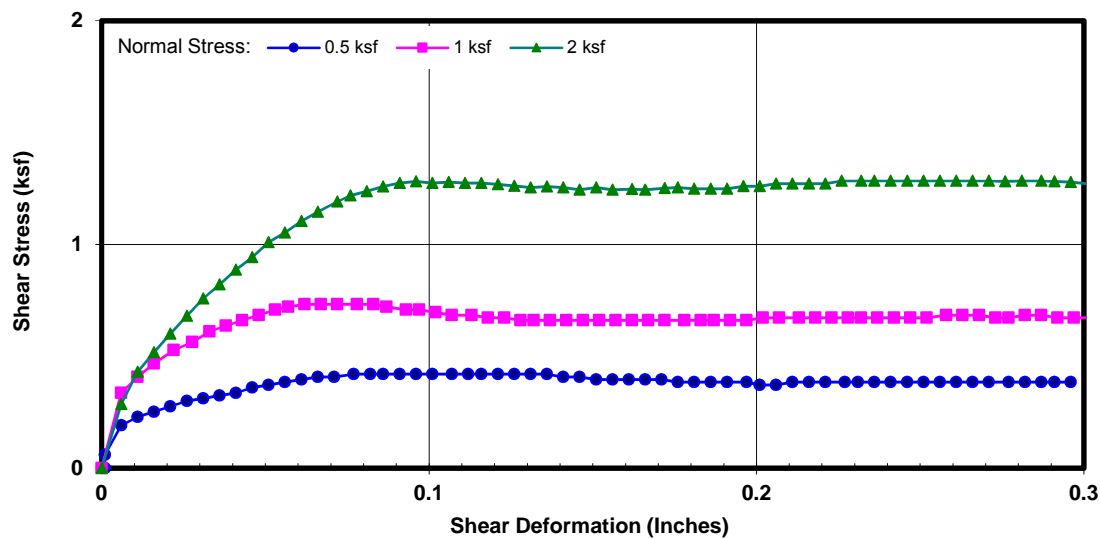


DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name: Municipal Water District - West Valley Feeder
Project No.: 20180213.002A
Boring No.: B-1
Sample No.: 3 Depth (ft): 5
Sample Type: Mod. Cal.
Soil Description: Silty Sand
Test Condition: Inundated Shear Type: Regular

Tested By: ST Date: 02/06/18
Computed By: JP Date: 02/07/18
Checked by: AP Date: 02/09/18

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
112.5	107.6	4.6	18.9	22	90	0.5	0.420	0.384
						1	0.732	0.672
						2	1.284	1.272



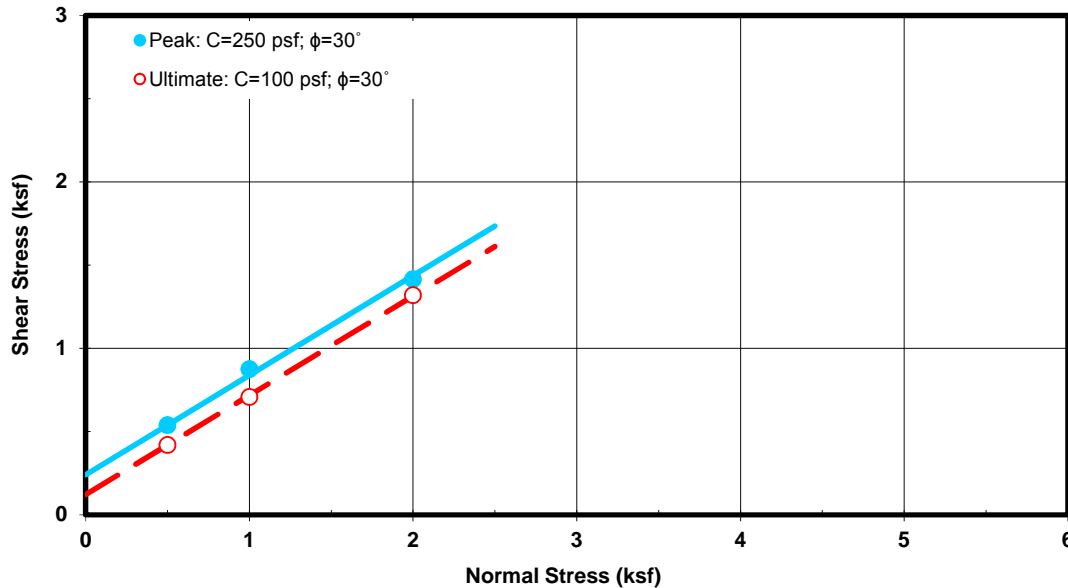
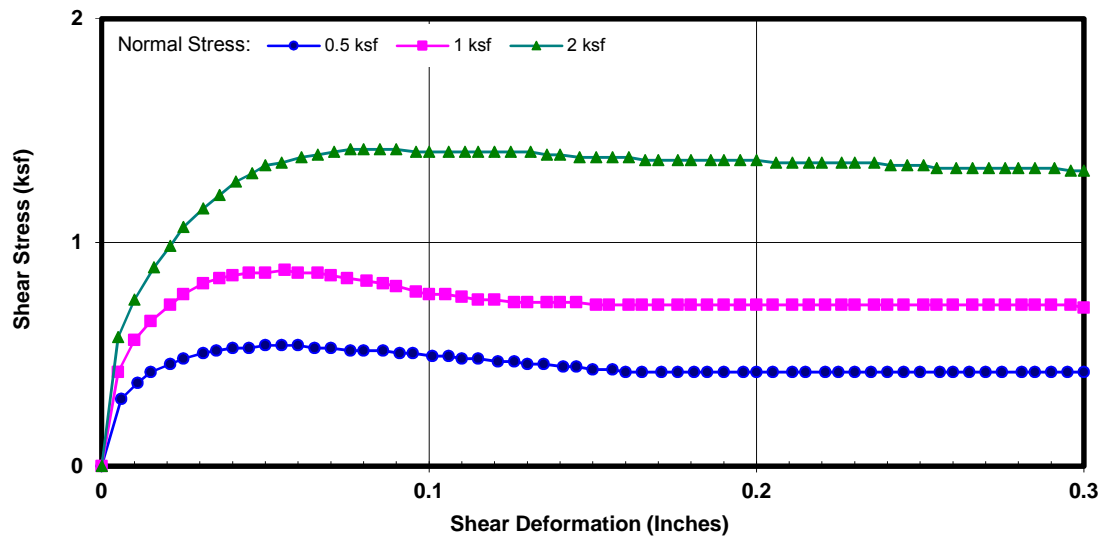


DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name: Municipal Water District - West Valley Feeder
Project No.: 20180213.002A
Boring No.: B-4
Sample No.: 2 Depth (ft): 5
Sample Type: Mod. Cal.
Soil Description: Silty Sand, fine-grained
Test Condition: Inundated Shear Type: Regular

Tested By: ST Date: 02/06/18
Computed By: JP Date: 02/07/18
Checked by: AP Date: 02/09/18

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
121.5	115.2	5.5	17.0	32	99	0.5	0.540	0.420
						1	0.876	0.708
						2	1.416	1.320



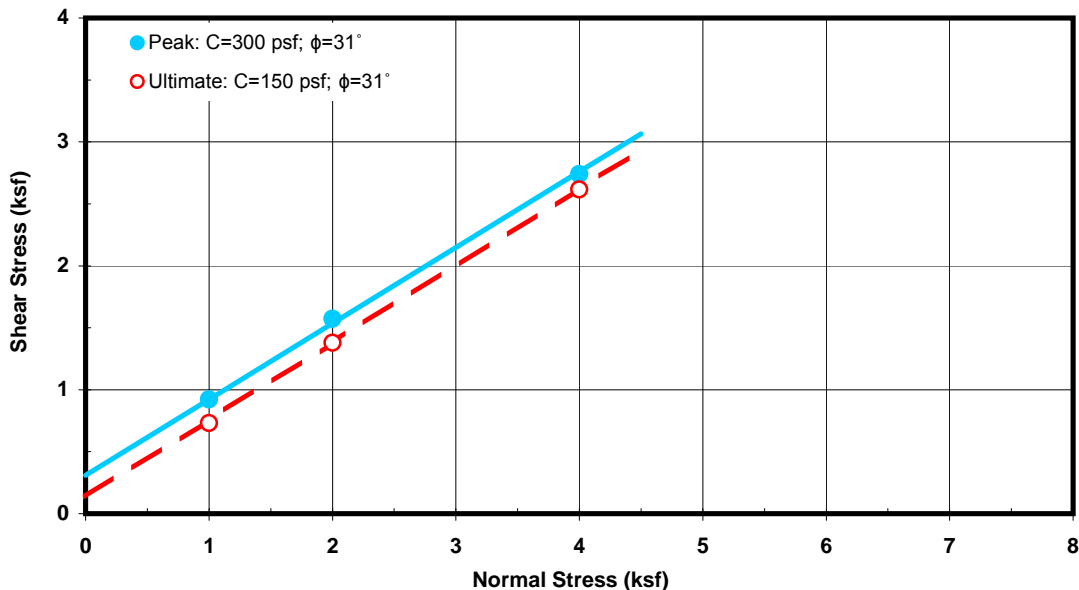
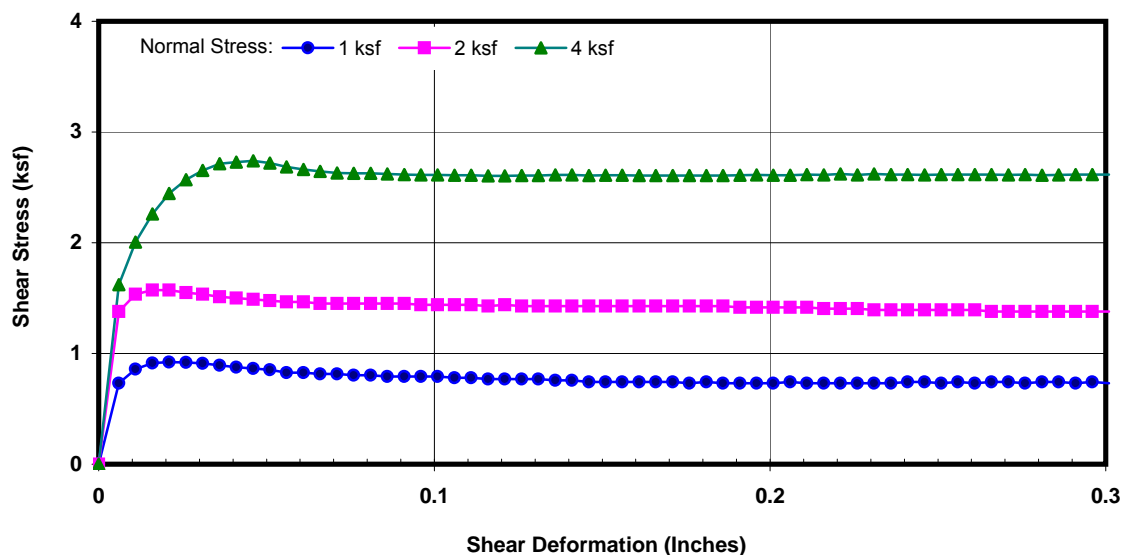


DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name: Municipal Water District - West Valley Feeder
Project No.: 20180213.002A
Boring No.: B-5
Sample No.: 1 Depth (ft): 0-5
Sample Type: Remolded to 90% RC at opt. MC
Soil Description: Silty Sand
Test Condition: Inundated Shear Type: Regular

Tested By: LS Date: 02/26/18
Computed By: JP Date: 02/27/18
Checked by: AP Date: 02/27/18

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
126.6	117.3	7.9	14.6	49	90	1	0.923	0.732
						2	1.572	1.380
						4	2.739	2.616



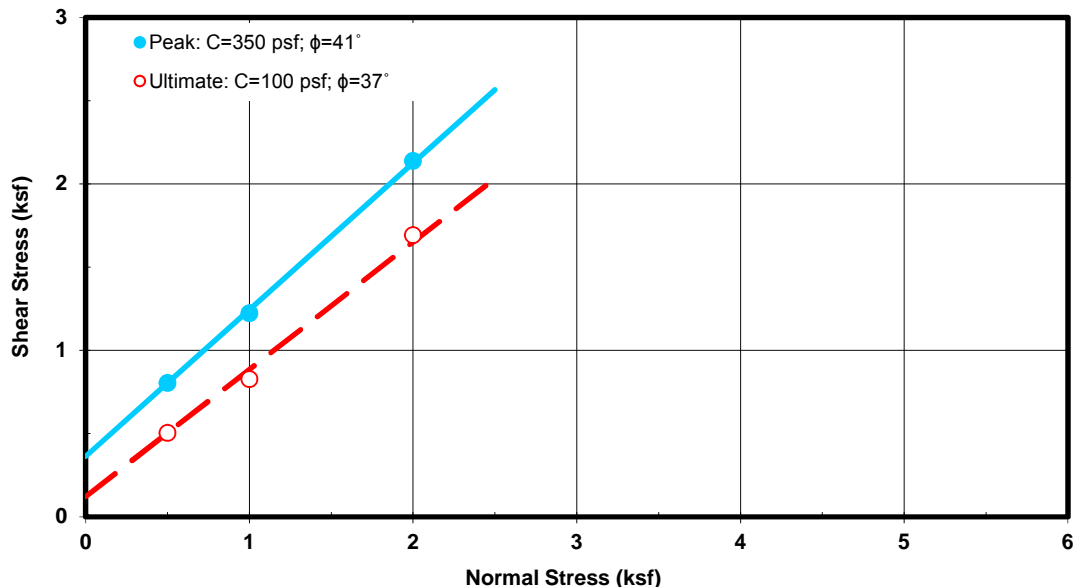
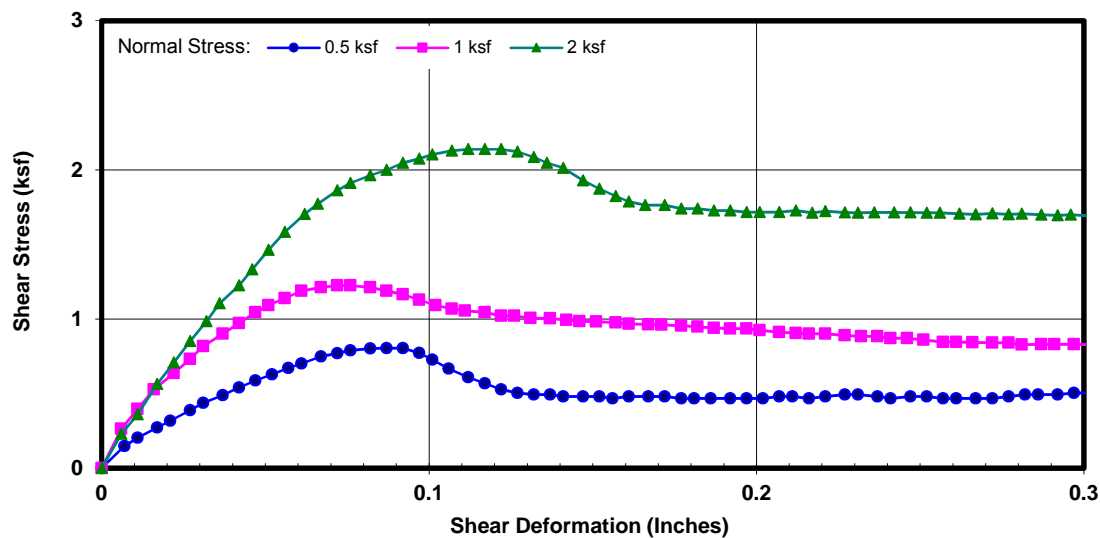


DIRECT SHEAR TEST RESULTS
ASTM D 3080

Project Name: Municipal Water District - West Valley Feeder
Project No.: 20180213.002A
Boring No.: B-5
Sample No.: 3 Depth (ft): 5
Sample Type: Mod. Cal.
Soil Description: Silty Sand
Test Condition: Inundated Shear Type: Regular

Tested By: ST Date: 02/06/18
Computed By: JP Date: 02/07/18
Checked by: AP Date: 02/09/18

Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)	Initial Degree Saturation (%)	Final Degree Saturation (%)	Normal Stress (ksf)	Peak Shear Stress (ksf)	Ultimate Shear Stress (ksf)
125.0	118.2	5.7	15.5	36	98	0.5	0.804	0.504
						1	1.224	0.828
						2	2.138	1.692



APPENDIX C

Seismic Refraction Survey Report

ADVANCED GEOSCIENCE, INC.

Geology and Geophysics
Subsurface Exploration

Non-Destructive Evaluation



24701 Crenshaw Blvd.
Torrance, California
90505 USA
Telephone (310) 378-7480
Fax (310) 872-5323
www.AdvancedGeoscience.com

February 6, 2018

via. Email (4 pages + Attachments)

Kleinfelder, Inc.
2280 Market Street
Suite 300
Riverside, California 92501

Attention: Mr. Richard Escandon, PG, CEG

Re: **Summary Report**
Seismic Refraction Survey for Bedrock Investigation
At MWD West Valley Feeders
Chatsworth, California

1.0 INTRODUCTION

This report summarizes the seismic refraction survey completed by Advanced Geoscience, Inc. at referenced site. This survey recorded the arrival times of seismic waves generated at the ground surface to prepare subsurface seismic velocity profiles for investigation of bedrock structure and rippability. The survey was performed along seismic survey lines positioned across the area shown on the site map in Figure 1 where grading is proposed for a future road.

The seismic refraction tomography data were recorded by Advanced Geoscience during a one-day field program completed on January 11, 2018. The data were recorded along two survey lines designated as Lines 1 and 2 (Figure 1). The data underwent computer processing to prepare 2D subsurface profiles showing seismic compressional-wave velocity layering in the upper 40 feet.

The following sections of this report provide a summary of our field survey procedures and methods of data processing and evaluation. A concluding section discusses the results of this seismic velocity profiling and compares these estimated subsurface velocities to the range of rippability for various Caterpillar ripping equipment.

2.0 FIELD SURVEY

Advanced Geoscience set up two survey lines designated as Lines 1 and 2. Line 1 was positioned across the proposed grading area along a south-to-north traverse extending across a hillside (Figure 1). Line 2 was positioned along a northwest-to-southeast traverse along a trail leading to Line 1. Both survey lines were positioned along straight-line traverses set up to avoid the heavier brush.

The seismic data were recorded using a multi-channel Seistronix EX-6 data acquisition system. This recording system was connected to geophones (seismic motion detectors) positioned in the ground at 10-foot intervals along the survey lines. Lines 1 and 2 were both set up with 21 geophones to provide a total line length of 200 feet. The geophones were 4-Hertz (lower-cutoff frequency), vertically-aligned velocity transducers.

The refraction data were recorded from eleven seismic energy “source points” positioned along each survey line. The source points started 5 feet off the first geophone position and continued at 20 to 30-foot intervals between the geophone positions. The last source point was positioned 5 feet off the last geophone position.

The seismic energy was generated using a 20-pound sledge hammer. The sledge hammer was used to make three impacts on a metal plate placed on the ground surface. At each source point, the recordings from the impacts were summed together to increase the amplitude of the seismic wave arrivals.

The positions of Lines 1 and 2 were marked by stakes placed at the end points of the lines and various breaks in the topography along the lines. The Metropolitan Water District (MWD) later arranged for a survey crew to measure the coordinates and elevations of these stakes.

3.0 DATA PROCESSING AND EVALUATION

The seismic data quality was good and adequate for the purposes of this investigation. The field records showed seismic wave arrivals from subsurface refraction events at all of the geophone positions.

The field records were input into the RAYFRACT seismic refraction tomography software developed by Intelligent Resources, Inc. (www.rayfract.com). RAYFRACT was used to generate seismic compressional-wave velocity profiles. This refraction tomography modeling procedure is generally more capable of imaging sharper lateral velocity variations due to bedrock structure than other refraction data modeling methods.

RAYFRACT was first used to graphically pick first arrival times (“first breaks”) for refracted waves traveling through the surface layer and into deeper higher-velocity layers. These time-distance data were used together with the geophone coordinates and elevations to conduct refraction tomography imaging of the subsurface seismic velocity layering. RAYFRACT first used the Delta TV (turning ray-based) method to generate an initial 2D velocity-depth model. This initial model was then refined to produce a closer fit to the arrival time data using the Wavepath Eikonal Traveltime (WET) tomographic inversion method with 25 iterations with a maximum velocity 3,500 m/sec. The best-fit velocity-depth models were then gridded and color contoured with SURFER (written by Golden Software, Inc.) to show estimated vertical and lateral velocity variations.

Figures 2 and 3 show the resulting seismic compressional-wave velocity profiles for Lines 1 and 2.

4.0 DISCUSSION OF RESULTS

The seismic compressional-wave velocity profiles for Lines 1 and 2 show 2,000 ft/sec or lower velocity layering in the upper 5 to 10 feet below ground surface (BGS). The materials in this depth interval are mostly colluvial soils and unconsolidated, decomposed bedrock. Below this depth the 3,000+ ft/sec velocity layering probably represents the upper weathered surface of the intact bedrock, which is mapped in this area as the late Cretaceous, Chatsworth Formation sandstone (reference: Preliminary Geologic Map of Los Angeles Quadrangle, USGS Open-File Report 2005-1019). Below this depth the bedrock velocities increase. Line 1 shows bedrock velocities as high as 8,000 ft/sec at the 40-foot depth level. Line 2 shows lower velocities in the range 5,000 to 5,500 ft/sec at the 40-foot depth level.

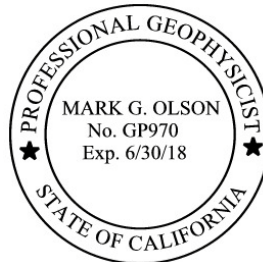
We understand that the depth of grading for the proposed road in this area is less than 20 feet BGS. The seismic velocities estimated along Lines 1 and 2 for this 20-foot depth interval are less than 6,000 ft/sec which indicates this upper bedrock material is mostly rippable for the Caterpillar D8R through D11R grading equipment. Figures 2 and 3 display the seismic velocity ranges for the rippability of sandstone bedrock estimated based on the graphs in the Caterpillar Handbook of Ripping, 12th Edition (Caterpillar, Inc., 2000). These velocity ranges are shown superimposed on the color velocity scales for the compressional-wave velocity profiles for Lines 1 and 2.

Kleinfelder, Inc.
February 6, 2016
Page 4

Advanced Geoscience appreciates this opportunity to be of service to Kleinfelder and the Metropolitan Water District. If you have any questions or additional requests concerning this seismic refraction survey please contact the undersigned.

Sincerely,

Advanced Geoscience, Inc.

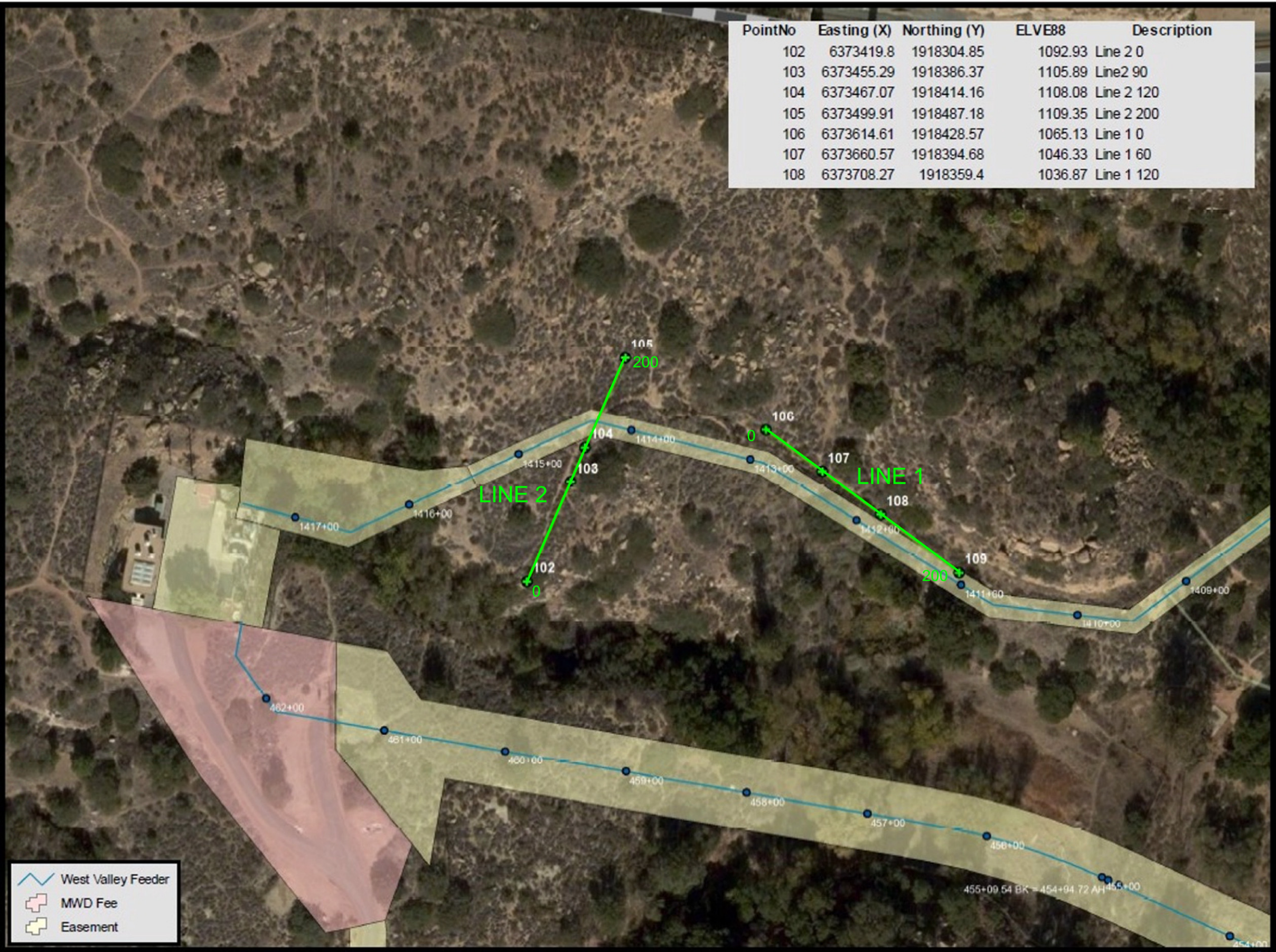


Mark G. Olson, PGp, PG, CHG
Advanced Geoscience, Inc.
Principal Geophysicist

Attachments:

- | | |
|----------|----------------------------------------------------------------|
| Figure 1 | Site Plan Showing Seismic Survey Lines 1 and 2 |
| Figure 2 | Line 1- Seismic Refraction Compressional-Wave Velocity Profile |
| Figure 3 | Line 2- Seismic Refraction Compressional-Wave Velocity Profile |

J:\Project\West_Valley_Feeder\GIS\Geophysical_Line.mxd Printed: 1/31/2018 Photography Date: 8/10 Prepared by: Ayl Unnam(Geodetic & Mapping Team) Checked by: Bel Sa Job# 031801-41



The Metropolitan Water District of Southern California
Engineering Services Group

West Valley Feeders

Survey Data - Geophysical Line

Site Map Showing Seismic Survey Lines 1 and 2
MWD West Valley Feeders Chatsworth, CA

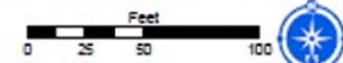
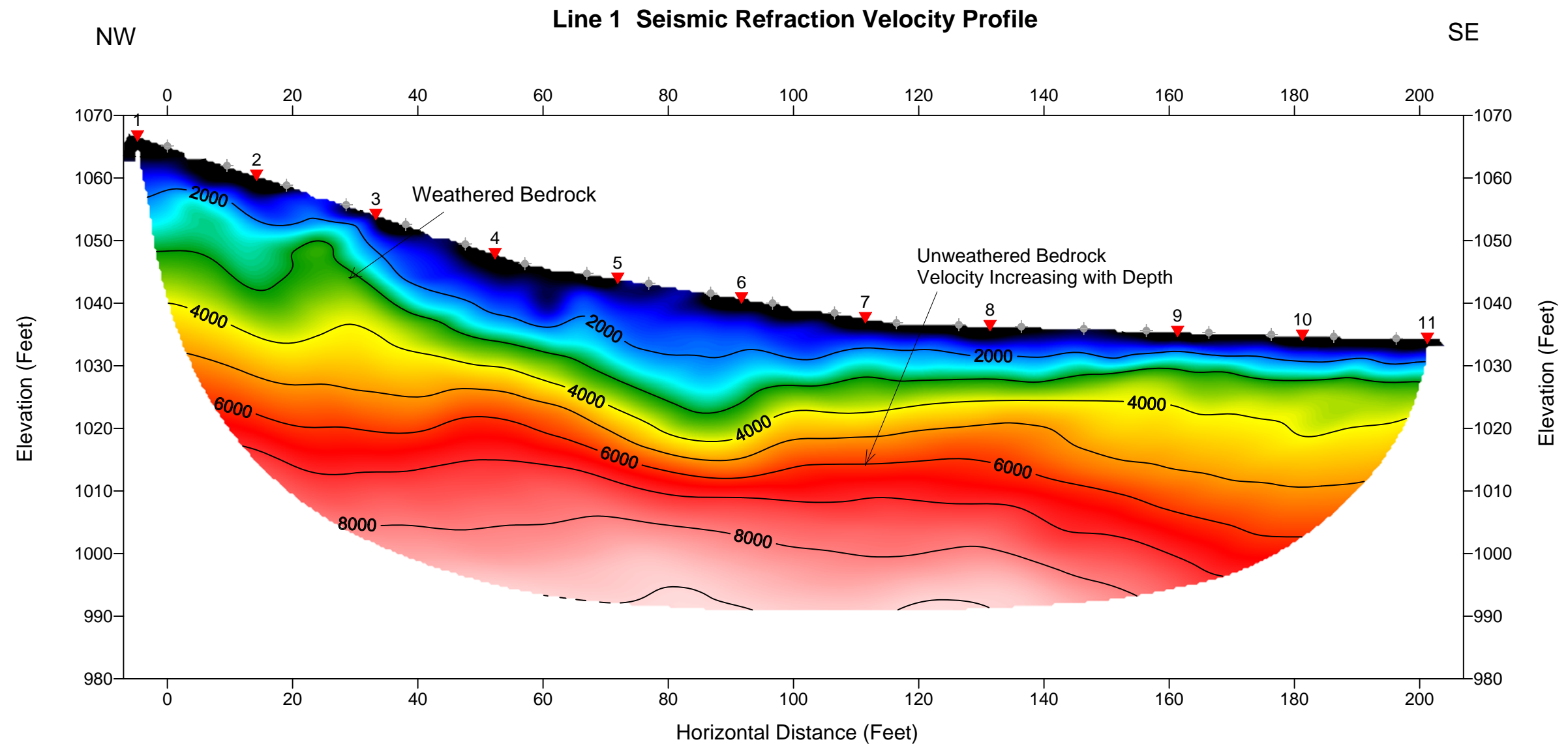


Figure 1
Advanced Geoscience, Inc.



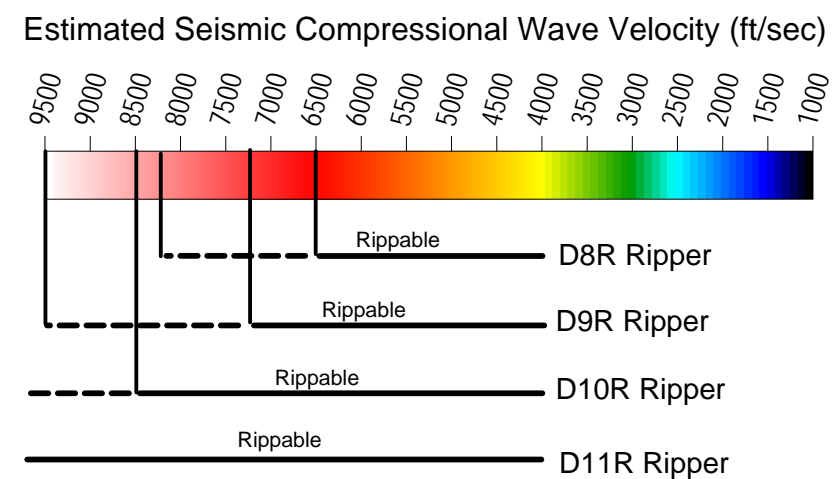
Horizontal & Vertical Scale 1 inch= 20 Feet
Seismic Velocity Contour Interval 1,000 ft/sec

Based on RAYFRAC T Refraction Tomography
Initial Delta TV Velocity Model + 25 WET Iterations w/Vmax= 3,500 m/sec

Estimated Rippability for Caterpillar Equipment
Based on Caterpillar Handbook of Ripping, 12th Edition

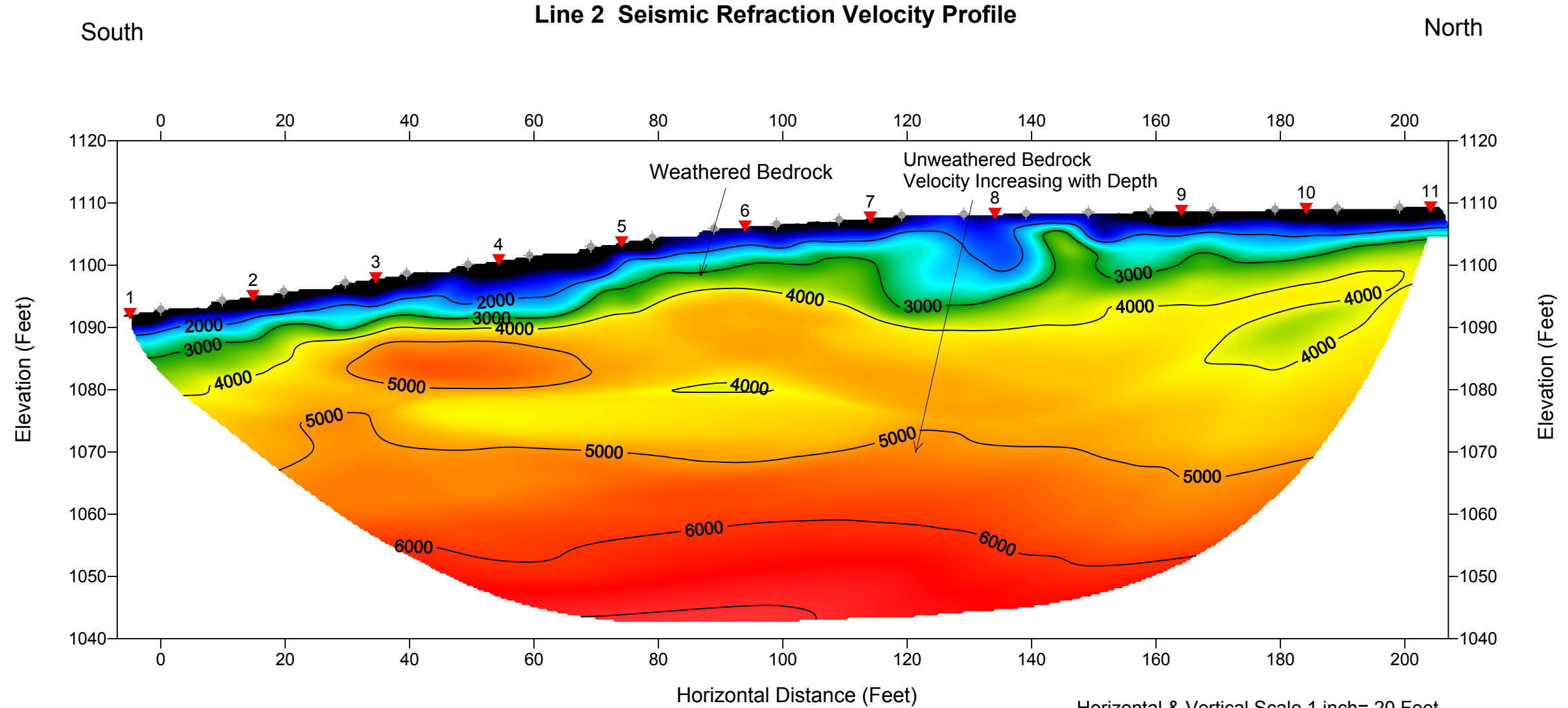
———— Rippable
----- Marginal Rippability

Seismic Velocity Range for Rippability of
Sandstone Rock Type for
Chatsworth Formation Sandstone (Kc)



Line 1 Seismic Refraction Velocity Profile
For Bedrock Investigation at MWD West Valley Feeders
Chatsworth, California

Figure 2
Advanced Geoscience, Inc.



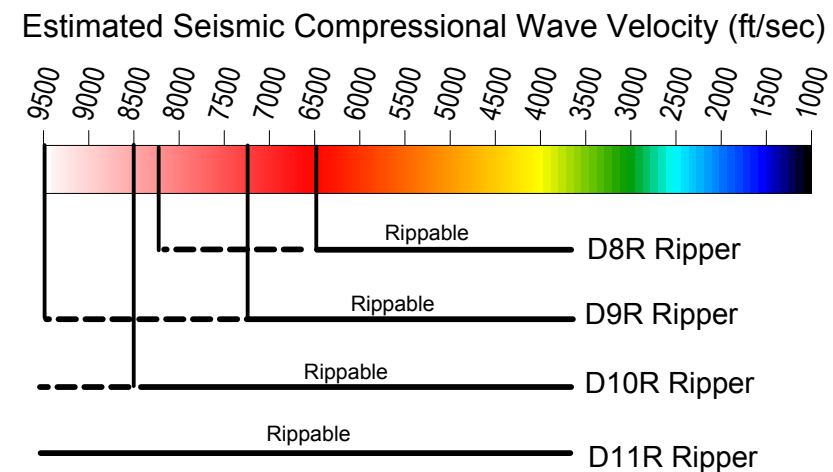
Horizontal & Vertical Scale 1 inch= 20 Feet
Seismic Velocity Contour Interval 1,000 ft/sec

Based on RAYFRAC T Refraction Tomography
Initial Delta TV Velocity Model + 25 WET Iterations w/Vmax= 3,500 m/sec

Estimated Rippability for Caterpillar Equipment
Based on Caterpillar Handbook of Ripping, 12th Edition

———— Rippable
----- Marginal Rippability

Seismic Velocity Range for Rippability of
Sandstone Rock Type for
Chatsworth Formation Sandstone (Kc)



Line 2 Seismic Refraction Velocity Profile
For Bedrock Investigation at MWD West Valley Feeders
Chatsworth, California

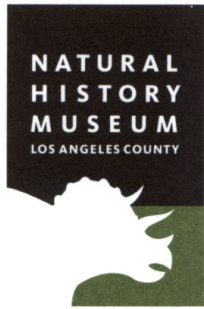
Figure 3
Advanced Geoscience, Inc.

APPENDIX G

PALEONTOLOGICAL RECORDS SEARCH

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org



Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

12 July 2018

Psomas
3 Hutton Centre Drive, Suite 200
Santa Ana, CA 92707-8794

Attn: Melissa Macias, Paleontologist

re: Paleontological Resources for the proposed West Valley Feeder Project, Psomas Project
3MWD010204, near the Chatsworth Reservoir, Los Angeles County, project area

Dear Melissa:

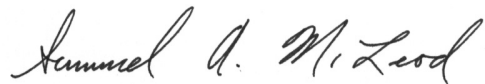
I have conducted a thorough search of our Vertebrate Paleontology records for the proposed West Valley Feeder Project, Psomas Project 3MWD010204, near the Chatsworth Reservoir, Los Angeles County, project area as outlined on the portion of the Oat Mountain USGS topographic quadrangle map that you sent to me via e-mail on 9 July 2018. We have no vertebrate fossil localities that lie directly within the boundaries of the proposed project area, but we do have localities nearby from the same sedimentary deposits that occur in the proposed project area.

In the entire proposed project area there are exposures of the marine late Cretaceous Chatsworth Formation. Our closest vertebrate fossil localities from the Chatsworth Formation are LACM 4913-1914, southwest of the proposed project area on the south side of Dayton Canyon, that produced fossil shark specimens including sand sharks, *Carcharhiniformes*, mackerel shark, *Cretolamna appendiculata*, crow shark, *Squalicorax kaupi*, dogfish shark, *Squalus*, and angel shark, *Squatina hassei*. Specimens of all of these sharks from localities LACM 4913-4914 were figured in the scientific literature by Welton and Alderson (1981. A Preliminary Note on the Late Cretaceous Sharks of the Chatsworth Formation at Dayton Canyon, Simi Hills, Los Angeles County, California. Society of Economic Paleontologists & Mineralogists Guidebook, 1981).

Any excavations in the Chatsworth Formation exposed throughout the proposed project area may well encounter significant remains of fossil vertebrates. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains while not impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils collected should be placed in an accredited scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

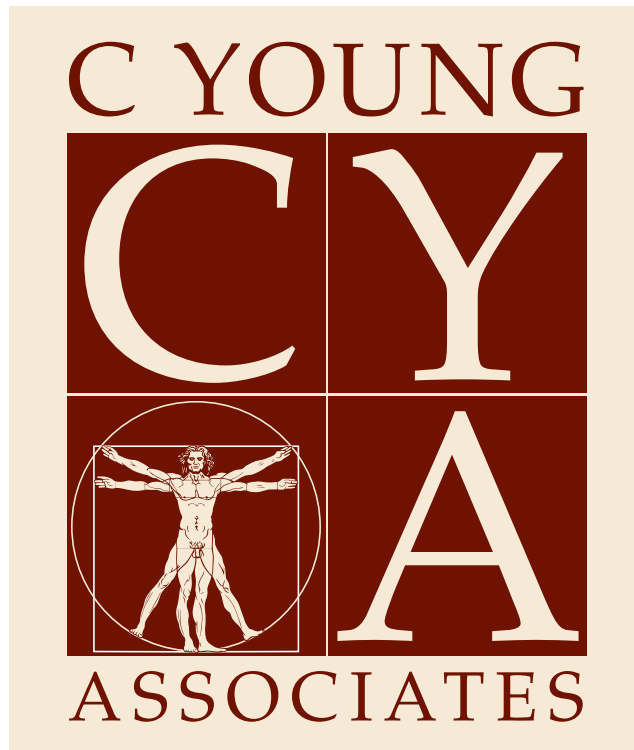
A handwritten signature in black ink, reading "Samuel A. McLeod". The signature is written in a cursive, flowing style.

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice

APPENDIX H

PHASE I ENVIRONMENTAL SITE ASSESSMENT



PHASE I ENVIRONMENTAL SITE ASSESSMENT

Metropolitan Water District of Southern California
West Valley Feeder No. 1 Stage 3 Improvements Project

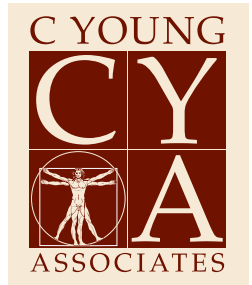
July 27, 2018 (Revised August 24, 2018)

Prepared for:

PSOMAS
3 Hutton Centre Drive, Ste 200
Santa Ana, CA 92807

Prepared by:

C Young Associates
1042 Skylark Drive
La Jolla, CA 92037



1042 Skylark Drive
La Jolla, CA 92037
Tel.: (858) 454-8885

July 27, 2018 (Revised August 24, 2018)

Jennifer Y. Marks
PSOMAS
3 Hutton Centre Drive, Ste 200
Santa Ana, CA 92807

Subject: **Phase I Environmental Site Assessment
Metropolitan Water District of Southern California
West Valley Feeder No. 1 Stage 3 Improvements Project
Los Angeles County, California**

Dear Ms. Marks:

C Young Associates (CYA) has performed a Phase I Environmental Site Assessment (ESA) of the above-referenced property in conformance with the scope and limitations of American Society for Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, ASTM Designation E1527-13 and Title 40 of the Code of Federal Regulations (40 CFR) Part 312. This ESA included public environmental agency and historical record reviews, interviews, site observations and this report preparation.

We appreciate the opportunity to be of service to you on this project. If you should have any questions regarding this report, or if we can be of further assistance, please contact us at (858) 945-7029.

C YOUNG ASSOCIATES

A handwritten signature in black ink, appearing to read 'Colin P. Young'.

Colin P. Young, CIH
Principal

A handwritten signature in black ink, appearing to read 'Daniel Weis'.

Daniel Weis, R.E.H.S.
Associate Environmental Scientist

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EXECUTIVE SUMMARY

At the request of PSOMAS, C Young Associates (CYA) conducted a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Standard Practice E1527-13 and Title 40 of the Code of Federal Regulations (40 CFR) Part 312 at the property identified as the Metropolitan Water District of Southern California (MWD) West Valley Feeder No. 1 Stage 3 Improvements Project in the Chatsworth community of Los Angeles, California (the Site). The findings of this ESA revealed the following:

- The Site is situated within Chatsworth Park South, which has a physical address of 22360 West Devonshire Street. The Site is situated in the central portion of the park generally between two water pump stations. These stations include the Twin Lakes pump station (Las Virgines Municipal Water District) to the east and a pump station operated by the Calleguas Municipal Water District to the west. The Site is further identified as portions of four legal parcels that include Assessor's Parcel Numbers (APNs) 2723-010-094, 2723-010-270, 2723-010-902 and 2723-010-903.
- The Site consists of multiple areas of varying sizes where future water infrastructure-related work is proposed. These areas are situated in the central portion of Chatsworth Park South between two water pump stations. The majority of the areas are unimproved, vacant land. Remaining areas are portions of access roads and trails or consist of existing infrastructure including air releases and blow-off valves. Portions of the Site are also underlain by the West Valley Feeder No. 1 and No. 2 water pipelines and a, reportedly abandoned, six-inch oil pipeline near the southwestern perimeter of the Site. The Site has remained predominately vacant and undeveloped over time. No significant environmental concerns were noted during our reconnaissance of the Site.
- The Chatsworth Park South property (of which the Site is a part) is listed on the Envirostor and Voluntary Cleanup Program (VCP) standard regulatory databases. The park is referenced as an active voluntary cleanup facility with a past use of a small arms firing range. The overall park property is under the regulatory agency oversight of the California Department of Toxic Substances Control (DTSC). There are no off-Site properties listed on regulatory databases that are considered to be environmental concerns to the Site.
- Section 4.2 of this report includes information pertaining to prior assessment and remedial activities completed at the Chatsworth South Park property, of which the Site is a part. The overall 72-acre park property was subject to DTSC regulatory agency oversight beginning in 2008 due to environmental impacts resulting from a former small arms firing range in the southern portion of the park. This use reportedly occurred from the early to mid-1950s until sometime in the mid-1960s. The operation of the firing range resulted in wide surficial spreading of lead shot and clay pigeon debris. Following the completion of the investigation

work, a Remedial Action Plan (RAP) for the park property was prepared in 2013. In the RAP, the overall park property was divided into 14 remedial areas identified as Areas "A" through "N." The various portions of the park property that comprise the Site (subject to our current Phase I ESA) are not mapped in any of the Remedial Areas, thus indicating that significant environmental impacts did not result at the Site from the former firing range activities that occurred to the south. However, being that the Site is situated within the overall park property that was subject to DTSC regulatory oversight and that a land use covenant (LUC) has yet to be negotiated with the City of Los Angeles, compliance with any and all DTSC directives relative to the RAP and the park will be required. The DTSC approved the RAP for the park and the RAP was implemented during the period of April 5, 2016 through December 30, 2016.

- Following completion of the RAP implementation, a Remedial Action Completion Report (RACR) was issued in December 2016. The RACR described in detail the implementation of the RAP. Because impacted soil remains beneath the engineered surface cap at depths ranging from one to four feet in the remedial areas at the park property, it was stated in the RACR that the City of Los Angeles and the DTSC will execute an LUC pertaining to the park property. The LUC would incorporate an Operations and Maintenance Plan (OMP) that will outline the requirements for future site work in order to maintain the constructed remedial components (i.e., engineered cap, fencing, etc.) and the requirements for future invasive work that could expose workers to residual contaminants. The DTSC reviewed the RACR and concurred with its findings as stated in a letter dated April 20, 2017. According to a DTSC representative, and as referenced above, the finalization and execution of the LUC and OMP is pending at this time.

In summary, this ESA has revealed no evidence of current *recognized environmental conditions* in connection with the Site. Historical impacts at the Site and its adjacent properties resulting from the former firing range activity to the south of the Site are considered to be a *controlled recognized environmental condition* that does not warrant additional assessment at this time.

As stated previously, although the subject Site was not considered to be significantly impacted and was not subject to remedial activities, the forthcoming LUC and OMP to be executed between the City and the DTSC may still apply to the Site, as it is part of the overall Chatsworth Park South property. Until such time that the Site is formally excluded from the LUC and OMP, all work performed in support of the Valley West Feeder No. 1 Access Road project shall comply with DTSCs directives relative to the RAP and the park.

In addition, while the reportedly abandoned six-inch oil pipeline in proximity to the Site limits was not deemed to be of environmental concern during prior assessment and remedial work completed under DTSC oversight, and no reports of a release of petroleum products from the pipeline have been reported, CYA cannot comment on actual subsurface conditions in the area of the pipeline. While CYA does not consider the pipeline to be a "recognized environmental condition" in connection with the Site, the client may desire a higher level of confidence regarding underlying subsurface

conditions in its vicinity. If so, it should consider additional evaluation. CYA has confirmed that the pipeline is maintained by Crimson Pipeline L.P. (Crimson), and Crimson has provided support documentation relative to the location of the pipeline. Crimson recommends that it be contacted either directly or via Underground Service Alert (USA) when Site construction activities begin in the area.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Phase I ESA is to provide a professional opinion on the presence of “recognized environmental conditions” and other suspect environmental conditions in connection with the Site, as they existed on the date of the site inspection, and to recommend whether further assessment is warranted. ASTM E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (hereinafter referred to as the “ASTM Standard”), specifies minimum requirements for conducting a Phase I ESA of a parcel of commercial real estate with respect to the range of contaminants pertinent to the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as well as petroleum products. As such, this Phase I ESA is intended to satisfy one of the threshold criteria for satisfying the landowner liability protections to CERCLA liability assuming compliance with other elements of the defense. In other words, this Phase I ESA represents one of the practices that constitute “all appropriate inquiry” into the previous ownership and uses of the property consistent with good commercial or customary practice, as defined in Title 42 of the United States Code (42 USC) Section 9601(35)(B) and 40 CFR Part 312, *Standards and Practices for All Appropriate Inquiry: Final Rule*.

The goal of the process is to identify “recognized environmental conditions,” which are defined by the ASTM Standard as “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.” The term “recognized environmental condition” includes hazardous substances or petroleum products even under conditions in compliance with laws. In addition, the term also included *historical recognized environmental conditions* and “controlled recognized environmental conditions.” A “historical recognized environmental condition” is defined by the ASTM Standard as “a past release of hazardous substances or petroleum products that has occurred in connection with a 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).” A “controlled recognized environmental condition” is defined by the ASTM Standard as “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).” The term “recognized environmental condition” is not intended to include *de minimis* conditions that generally do not present a material risk of harm to

public 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.

The term "environment" is defined in CERCLA 42 USC 9601(8) as "(A) the navigable waters, the water of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the United States under the Magnuson-Stevens Fishery Conservation and Management Act", and "(B) any other surface water, groundwater, drinking water supply, land surface or subsurface strata, or ambient air within the United States or under the jurisdiction of the United States."

The term "release" means any "spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant)", but excludes "(A) any release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against the employer of such persons, (B) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine, (C) release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954 [42 USC 2011 et seq.], if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under section 170 of such Act [42 USC 2210], or, for the purposes of 42 USC 9604 or any other response action, any release of source byproduct, or special nuclear material from any processing site designated under section 7912(a)(1) or 7942(a) of this title, and (D) the normal application of fertilizer."

1.2 Detailed Scope of Services

The Phase I ESA was conducted in accordance with the above-referenced ASTM Standard, 40 CFR Part 312 and CYA's Agreement by and between CYA and the client. The following services were provided for this assessment:

- A search for environmental liens recorded against the Site.
- An evaluation of standard environmental record sources contained within Federal, State and local environmental databases within specific search distances.
- An evaluation of additional environmental record sources obtained from local regulatory departments/agencies.
- A qualitative evaluation of the physical characteristics of the Site through a review of: published topographic, geologic, and hydrogeologic maps; published groundwater data, and; area observations to characterize surface water flow in the Site area.

- An evaluation of past Site and adjacent/nearby property uses through a review of historical resources including aerial photographs, topographic maps and city directories.
- A physical inspection of the Site conducted to search for conditions indicative of potential environmental concerns including USTs, aboveground storage tanks (ASTs), associated tank piping, stained soil or pavement, equipment that may contain or have historically contained polychlorinated biphenyls (PCBs), and other potential environmental concerns as defined in the ASTM Standard.
- A physical assessment of indications of past uses and visual observations of adjacent and surrounding properties (from curbside or public spaces) to assess potential impacts to the Site.
- Interviews completed with the client, the Site owner(s) and local regulatory officials.
- The preparation of this Phase I ESA report, which includes the findings of the assessment, our opinion (i.e., conclusions) regarding their respective levels of significance, and recommendations, as appropriate.

1.3 Significant Assumptions

This Phase I ESA was conducted in accordance with the scope and terms referenced above. No other warranty, express or implied, is made by CYA. CYA's evaluations, analyses, and opinions should not be taken as representations regarding subsurface conditions or the actual value of the Site. Subsurface conditions may differ from the conditions implied by the surficial observations and the data resources reviewed, and can only be reliably evaluated through intrusive techniques.

Documentation and data provided by the client, designated representatives of the client, other interested third parties, or from the public domain, and referred to in the preparation of this assessment, are assumed to be complete and correct and have been used and referenced with the understanding that CYA assumes no responsibility or liability for their accuracy. CYA's conclusions are based upon such information and documentation and on our observations of Site conditions, as they existed on the date of the site inspection. Because Site conditions may change significantly over a short period of time and additional data may become available, data reported and conclusions drawn in this report are limited to current conditions and should be considered less reliable with passing time.

1.4 Limitations and Exceptions

Reasonable efforts have been made during this assessment to uncover evidence of USTs, ASTs, ancillary equipment associated with such tanks, and other subsurface structures. "Reasonable efforts" are limited to information gained from visual

observation of unobstructed areas, recorded database information held in public record, and available information gathered from interviews. Such methods may not identify subsurface equipment that may have been hidden from view due to paving, construction or debris pile storage, or incorrect information from sources.

This investigation was not an environmental compliance audit. While some observations and discussion in this report may address conditions and/or operations that may be regulated, the regulatory compliance of those conditions and/or operations is outside the scope of this investigation. Nothing in this report constitutes a legal opinion or legal advice. For information regarding specific individual or organizational liability, CYA recommends consultation with independent legal counsel.

According to 40 CFR Part 312, CERCLA liability rests with the owner or operator of a property and not with an environmental professional hired by the prospective landowner and who is not involved with the ownership or operation of the property. This report meets the requirements set forth in 40 CFR Part 312. However, in order to qualify for certain landowner liability protections under CERCLA, "Bona Fide Prospective Purchasers, Contiguous Property Owners, and/or Innocent Landowners" must meet additional requirements of CERCLA (42 USC 9601 (35)(B)).

This ESA does not address non-ASTM scope considerations, including asbestos-containing materials, radon, lead-based paint, lead in drinking water, wetlands, protected environments and habitat, industrial hygiene concerns, indoor air quality (unrelated to releases of hazardous substances or petroleum products into the environment) and high voltage power lines.

1.5 Special Terms and Conditions

No special terms and conditions between CYA pertinent to the findings of this Phase I ESA or methodology used to complete this assessment are noted. In addition, CYA does not have a financial interest in the Site.

1.6 User Reliance

This report was prepared for the sole and exclusive use of the client and its client, and is not for the use or benefit of, nor may it be relied upon by, any other person or entity for any purpose without the advance written consent of CYA and the client. CYA makes no representation to any third party except that it has used the degree of care and skill ordinarily exercised by a reasonably prudent qualified environmental professional in the same community and in the same time frame given the same or similar facts and circumstances. No other use or disclosure is intended or authorized by CYA. In the preparation of this Phase I ESA, CYA has used the degree of care and skill ordinarily exercised by a reasonably prudent environmental professional in the same community and in the same time frame given the same or similar facts and circumstances. No other warranties are made, express or implied.

2.0 SITE DESCRIPTION

2.1 Location and Legal Description

The Site is known as the West Valley Feeder No. 1 Stage 3 Improvements Project in the Chatsworth community of Los Angeles, California. The Site is situated within Chatsworth Park South, which has a physical address of 22360 West Devonshire Street. The Site is situated in the central portion of the park, generally between two water pump stations. These stations include the Twin Lakes pump station operated by the Las Virgenes Municipal Water District to the east, and a pump station operated by the Calleguas Municipal Water District to the west. The Site is further identified as portions of four legal parcels that include APNs 2723-010-094, 2723-010-270, 2723-010-902 and 2723-010-903. A Vicinity Map and Topographic Map depicting the general location of the Site are included in Appendix A.

2.2 Site and Vicinity General Characteristics

The Site and its adjacent/nearby properties are situated within the Chatsworth community of Los Angeles, California and, more specifically, within Chatsworth Park South, which is owned and managed by the City of Los Angeles. The general Site vicinity consists of other portions of Chatsworth Park South, open space and residential development.

2.3 Current Use of the Site

The majority of the Site is vacant land situated in the central portion of Chatsworth Park south between the above-referenced two water pump stations. Limited areas of the Site consist of portions of access roads and trails or consist of existing water infrastructure.

2.4 Description of Structures, Roads, Other Improvements on the Site

The majority of the Site is unimproved. Some areas of the Site are situated between existing access roads and trails or consist of existing water infrastructure. Portions of the Site are also underlain by the West Valley Feeder No. 1 and No. 2 water pipelines and a, reportedly abandoned, six-inch oil pipeline near the southwestern perimeter of the Site. Please refer to Section 4.2 for additional information pertaining to the noted oil pipeline. Potable water and sanitary sewer services in the area are provided by the Los Angeles Department of Water and Power. Electrical service in the area is also provided by the Los Angeles Department of Water and Power and natural gas services are provided by Southern California Gas Company. Site Plans are included in Appendix B. Photographs taken of the Site are included in Appendix C.

2.5 Current Uses of the Adjoining Properties

CYA performed a visual inspection of adjoining properties from adjacent roadways and public right-of-ways. The following table identifies the adjacent property uses:

General Direction	Adjoining Property Use
North	Vacant land (Chatsworth Park South) and railroad tracks
South	Chatsworth Park South (vacant and improved portions)
West	Water pump station and vacant land (Chatsworth Park South)
East	Chatsworth Park South (vacant and improved portions) and residential development

None of the adjoining properties were observed to be a significant environmental concern to the Site based on CYA's visual inspection from public right-of-ways.

3.0 USER PROVIDED INFORMATION

3.1 Title Records

No current environmentally related liens, deed restrictions or activity and use limitations pertaining to the Site were noted during research conducted with the County of Los Angeles Tax Assessor. In addition, the client is unaware of such encumbrances recorded against the Site.

3.2 Environmental Liens or Activity and Use Limitations

The client reportedly has no knowledge of any environmental related liens or activity and use limitations (i.e. engineering or institutional controls) that are related to potential environmental issues at the Site.

3.3 Specialized Knowledge

The client reportedly has no specialized knowledge pertinent to potential “recognized environmental conditions” at the Site.

3.4 Commonly Known or Reasonably Ascertainable Information

The client has no other knowledge of commonly known or reasonably ascertainable information pertinent to potential “recognized environmental conditions” at the Site.

3.5 Valuation Reduction for Environmental Issues

As of the date of this report, the client reportedly has no information pertaining to the relationship of the appraised value of the Site to the estimated fair market value of the Site that might indicate that significant contamination exists.

3.6 Owner, Property Manager, and Occupant Information

As stated previously, the Site includes portions of Los Angeles County APNs 2723-010-094, 2723-010-270, 2723-010-902 and 2723-010-903. Ownership of these parcels is as follows:

- APN 2723-010-094 - City of Los Angeles
- APN 2723-010-270 - Calleguas Municipal Water District
- APN 2723-010-902 - Metropolitan Water District
- APN 2723-010-903 - Metropolitan Water District

The Site owners are also considered to be the Site managers. The Site has no known occupants.

3.7 Reason for Performing Phase I ESA

CYA, as an independent consultancy, has been retained to conduct this Phase I ESA to identify environmental issues that may be present and to comply with 40 CFR Part 312.

4.0 RECORDS REVIEW

4.1 Standard Environmental Record Sources

CYA reviewed Federal and State environmental databases provided by EDR of Shelton, Connecticut for information pertaining to documented and/or suspected releases of regulated hazardous substances and/or petroleum products within specified search distances. A copy of the EDR report is included in Appendix D.

CYA also reviewed unmappable sites listed in the environmental database report by cross-referencing addresses and site names. Unmappable sites are sites that cannot be plotted with confidence but can be located by zip code or city name. In general, a site cannot be mapped because of inaccurate or missing location information in the record provided by the regulatory agency. Any unmappable sites that CYA identifies within the specified search radii were evaluated as part of the preparation of this report.

The following Federal databases related to potential on-site and off-site sources of contamination were reviewed and interpreted by CYA:

Federal Databases	Search Distance From Site
National Priorities List (NPL)	One mile
Proposed NPL	One mile
NPL Liens	Target Property
Delisted NPL	One mile
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) – FEDERAL FACILITY AND SEMS	One-half mile
CERCLIS No Further Remedial Action Planned (NFRAP) – SEMS ARCHIVE	One-half mile
Resource Conservation and Recovery Act (RCRA) CORRACTS Facilities List	One mile
RCRA NON-CORRACTS Hazardous Waste Treatment, Storage and Disposal (TSD) Facilities	One-half mile
RCRA Hazardous Waste Generators (RCRA GEN) – Large Quantity Generators (LQG), Small Quantity Generators (SQG) and Conditionally Exempt Small Quantity Generators (CESQG)	One-eighth mile
Federal Institutional/Engineering Control Registries (IC/EC) – LUCIS, US ENG CONTROLS, and US INST CONTROLS	One-half mile
Emergency Response Notification System (ERNS)	One-eighth mile

The following State/local databases related to potential on-site and off-site sources of contamination were also searched and reviewed:

State/Local Databases	Search Distance From Site
State Equivalent NPL and CERCLIS (RESPONSE and Envirostor)	One mile
Inactive, Active, and/or Permitted Solid Waste/Landfill Facilities (SWF/LF)	One-half mile
San Diego County DEH Site Assessment and Mitigation (SAM)	One-half mile
Leaking Underground Storage Tanks (LUST)	One-half mile
Spills, Leaks, Investigations, and cleanup (SLIC)	One-half mile

State/Local Databases	Search Distance From Site
Registered Storage Tanks (UST/AST)	One-eighth mile
State Voluntary Cleanup Program (VCP)	One-half mile
State Brownfield Sites (BROWNFIELDSD)	One-half mile

Descriptions/sources of each of the above-referenced regulatory databases and the dates these databases were last updated by the applicable regulatory agencies are included in the EDR report.

Site

The Chatsworth Park South property (of which the Site is a part) is listed on the Envirostor and VCP standard regulatory databases. The park is referenced as an active voluntary cleanup facility with a past use of a small arms firing range. The overall park property is under the regulatory agency oversight of the DTSC. Please refer to Section 4.2 below for information pertaining to prior assessment and remedial activities completed at the park property.

Adjoining and Nearby Properties

One property was identified in the standard regulatory databases mapped within one mile of the Site. The property is identified as Chime Charter Middle School and is mapped approximately one-half mile to the east-southeast at 22280 Devonshire Street. The property was issued a no further action status in 2007. This property is not considered to be an environmental concern to the Site.

Non-ASTM Database Reviews

Below is a list of non-ASTM databases searched by EDR and reviewed by CYA during the preparation of this assessment. The descriptions of each database and their data release frequency are included in the EDR report, included in Appendix D.

Local Brownfield Lists

US BROWNFIELDSD - 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

AOCONCERN - San Gabriel Valley Areas of Concern

US HIST CDL - National Clandestine Laboratory Register
HIST Cal-Sites - Historical Cal-Sites Database
SCH - School Property Evaluation Program
CDL - Clandestine Drug Labs
Toxic Pits - Toxic Pits Cleanup Act Sites
US CDL - Clandestine Drug Labs

Local Lists of Registered Storage Tanks

SWEEPS UST - SWEEPS UST Listing
HIST UST - Hazardous Substance Storage Container Database
CA FID UST - Facility Inventory Database

Local Land Records

LIENS - Environmental Liens Listing
LIENS 2 - CERCLA Lien Information
DEED - Deed Restriction Listing

Records of Emergency Release Reports

HMIRS - Hazardous Materials Information Reporting System
CHMIRS - California Hazardous Material Incident Report System
LDS - Land Disposal Sites Listing
MCS - Military Cleanup Sites Listing
SPILLS 90 - SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA - NonGen - RCRA - Non-Generators
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 ASDH DOE - Sleam Electric Plan Operation Data Listing
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
UXO - Unexploded Ordnance Sites
DOCKET HWC - Hazardous Waste Compliance Docket Listing
ECHO - Enforcement and Compliance History Information
FUELS PROGRAM - EPA Fuels Program Registered Listing
CA BOND EXP. PLAN - Bond Expenditure Plan
Cortese - "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings - CUPA Resources List
DRYCLEANERS - Cleaner Facilities
EMI - Emissions Inventory Data
ENF - Enforcement Action List
Financial Assurance - Financial Assurance Information Listing
ICE
HIST CORTESE - Hazardous Waste & Substance Site List
HAZNET - Facility and Manifest Data
LOS ANGELES CO. HMS - HMS: Street Number List
HWP - Envirostor Permitted Facilities List
HWT - Registered Hazardous Waste Transporter Database
MINES - Mines Master Index File
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
LA Co. Site Mitigation - Site Mitigation List
UIC - UIC Listing
WASTEWATER PITS - Oil Wastewater Pits Listing
WDS - Waste Discharge System
WIP - Well Investigation Program Case List
NON-CASE INFO
SAMPLING POINT
PROD WATER PONDS
MILITARY PRIV SITES
OTHER OIL GAS
WELL STIM PROJ - Well Stimulation Project
UIC GEO
PROJECT
CIWQS - The California Integrated Water Quality System

The Chatsworth Park South property (of which the Site is a part) is listed on the non-ASTM Haznet, CIWQS and NPDES databases. The park property is referenced on the Haznet database for the disposal of hazardous waste generated during cleanup activities. Please refer to Section 4.2 below for information pertaining to prior assessment and recent remedial activities completed at the park property. The park property appears on the CIWQS and NPDES databases for stormwater permit and control related requirements. The permits are noted as being held by the City of Los Angeles Department of Recreation and Parks.

One property was identified in the non-ASTM regulatory databases mapped within one mile of the Site. The property is identified as Chime Charter Middle School and is located at 22280 Devonshire Street. As stated previously, this property is not considered to be an environmental concern to the Site.

4.2 Additional Environmental Record Sources

California Department of Toxic Substances Control

The overall Chatsworth Park South property was subject to DTSC regulatory agency oversight beginning in 2008 due to environmental impacts resulting from a former small arms firing range in the southern portion of the park. This use reportedly occurred from the early to mid-1950s until sometime in the mid-1960s. The operation of the firing range resulted in wide surficial spreading of lead shot and clay pigeon debris. The City of Los Angeles acquired the park property in 1973 and developed the relatively level portions of the park area with recreational improvements. The development and grading activities occurred during the 1970s and 1980s. The grading activities were associated with the leveling of the former skeet range area, planting of trees, soil removal and compaction for development of an existing recreation building, and preparation for a parking area, play areas, a basketball court, and tennis courts. Grading also occurred during placement of water/oil transmission pipelines at the property.

Multiple environmental investigations throughout the park property were conducted between 2008 and 2012. The investigations included the drilling of multiple soil borings and the collection of soil and groundwater samples. A human health risk assessment was also conducted. During the investigation work, the overall park property was divided into seven areas of environmental concern. Of the seven areas, two appear to have been situated within portions of the Site. These areas were identified as Area Four (Visible Lead Pellet Accumulation Area) and Area 5 (Former Fish Pond). Contaminants of potential concern in these areas included lead, arsenic and polycyclic aromatic hydrocarbons (PAHs). The contaminant concentrations in such areas were noted as being relatively low and not of significant concern to human health.

Following the completion of the investigation work, a RAP for the park property was prepared in 2013. The objective of the RAP was to mitigate potential risk from contaminants in soil that may pose a threat to human health and the environment. Based on the comparative evaluation of the three alternatives considered in the RAP, Containment Through Surface Capping was selected as the remedial action alternative

for addressing the metal and PAH-impacted shallow soils at the park property. This alternative was selected because it was determined to be effective, implementable, and cost effective. In the RAP, the overall park property was divided into 14 remedial areas identified as Areas "A" through "N." The various portions of the park property that comprise the Site (subject to our current Phase I ESA), including the two areas referenced above, are not mapped in any of the Remedial Areas as remedial work within the limits of the Site was not deemed warranted based on the results of the investigation activities. This indicates that significant environmental impacts did not result at the Site from the former firing range activities that occurred to the south. However, being that the Site is situated within the overall park property that was subject to DTSC regulatory oversight and that an LUC has yet to be negotiated with the City of Los Angeles, compliance with any and all DTSC directives relative to the RAP and the park will be required.

The DTSC approved the RAP for the park and the RAP was implemented during the period of April 5, 2016 through December 30, 2016. The RAP implementation included the following:

- Manually removing readily visible lead pellets with vacuums, rakes, and/or shovels.
- Removing all short shrubs and seasonal vegetation to expose the underlying surface.
- Removing remaining visible lead pellets and surficial soil using manual labor equipped with vacuums, rakes, and shovels.
- Containing all recovered lead pellets and any associated soil or debris in appropriate containers.
- Profiling the waste and disposing of approximately 500 tons of hazardous waste at off-property locations.
- Hydro-seeding an impacted rocky outcrop with native grasses.
- Completion of controlled rough and fine grading (one foot surface cap construction).
- Export of non-hazardous and hazardous waste soils (approximately 6,000 tons).
- Sampling and analysis of clean import aggregate base and soil.
- Import of clean import aggregate base and soil.
- Revegetation of the surface cap area.
- Improving the stormwater drainage system.

Following completion of the RAP implementation, a RACR was issued in December 2016. The RACR described in detail the implementation of the RAP. Because impacted soil remains beneath the engineered surface cap at depths ranging from one to four feet in the remedial areas at the park property, it was stated in the RACR that the City of Los Angeles and the DTSC will execute an LUC pertaining to the park property. This institutional control will limit the potential for future exposure of receptors to contaminated soils through controlling and limiting future excavation, routine maintenance and any other disturbances to the cap in an effort to protect human health and the environment. The LUC would incorporate an OMP that will outline the requirements for future site work in order to maintain the constructed remedial

components (i.e., engineered cap, fencing, etc.) and the requirements for future invasive work that could expose workers to residual contaminants.

The DTSC reviewed the RACR and concurred with its findings as stated in a letter dated April 20, 2017. A copy of the letter is included in Appendix E. At the time of this report, finalization and execution of the LUC and OMP is pending at this time.

Although the subject Site of this Phase I ESA was not considered to be significantly impacted and was not subject to remedial activities, the forthcoming LUC and OMP between the City and the DTSC may still apply to the Site, as it is part of the overall Chatsworth Park South property. Until such time that the Site is formally excluded from the LUC and OMP, all work performed in support of the Valley West Feeder No. 1 Access Road project shall comply with DTSCs directives relative to the RAP and the park.

As stated previously and according to the URS RAP and RACR documents, a portion of a reportedly abandoned six-inch oil pipeline appears to be present near the southwestern perimeter of the Site. While the pipeline was not deemed to be of environmental concern during prior assessment and remedial work completed under DTSC oversight, and no reports of a release of petroleum products from the pipeline have been reported, CYA cannot comment on actual subsurface conditions in the area of the pipeline. While CYA does not consider the pipeline to be a “recognized environmental condition” in connection with the Site, the client may desire a higher level of confidence regarding underlying subsurface conditions in its vicinity. If so, it should consider additional evaluation.

CYA has confirmed that the pipeline is maintained by Crimson, and Crimson has provided support documentation relative to the location of the pipeline (Appendix F). In the referenced correspondence, Crimson recommends that it be contacted either directly or via Underground Service Alert (USA) when Site construction activities begin in the area

Other Agency Records

Based on DTSC involvement with the Chatsworth Park South Property and documentation of prior subsurface assessment activities and remedial work at the park property, additional public agency records searches were not deemed warranted by CYA.

4.3 Physical Setting Sources

The following physical setting sources were reviewed to provide information about the topographic, hydrologic, geologic and/or hydrogeologic characteristics of the Site.

4.3.1 Topography and Hydrology

USGS Topographic Quadrangle

According to the U.S. Geological Survey topographic map for the Los Angeles California 7.5 minute Oat Mountain quadrangle (2015), the Site is situated at elevations ranging from approximately 1,000 feet to 1,100 feet above mean sea level. Site topography trends generally downward toward the east and southeast. Streets/roadways bordering the Site are shown similar to their current configurations on the map.

Hydrology/Storm Water Management

The Site slopes downward generally to the east and southeast toward municipal storm drain systems maintained by the City of Los Angeles. The Site may receive drainage from up-gradient, off-Site properties during significant rain events.

4.3.2 Geology

The Site is located in the western portion of the Transverse Ranges Geomorphic Province at the extreme west end of the San Fernando Valley. The ranges extend from west of Point Conception eastward approximately 500 kilometers into the Mojave and Colorado Desert. The geology and topography of the ranges express three distinct segments that have contrasting elevations, rock types, and vegetation. Sedimentary rocks of the Cretaceous Chatsworth Formation are exposed in the area. There is also alluvium present in the general Site vicinity and potentially at the Site.

4.3.3 Hydrogeology

According to the Water Quality Control Plan for the Los Angeles Basin (Region 4) published by the California Regional Water Quality Control Board (RWQCB), the Site is located within the Bull Canyon Hydrologic Sub Area of the San Fernando Hydrologic Area of the Los Angeles-San Gabriel Hydrologic Unit. The basin has been classified as having existing beneficial uses for municipal, agricultural and industrial service supply. Groundwater beneath the Site is expected to be present at a depth greater than approximately 10 feet below the ground surface with an anticipated flow direction to the east.

4.4 Historical Use Information on the Subject Site

CYA reviewed historical sources (as described in the following sections) to develop a history of the previous uses of the Site, in order to help identify the likelihood of past uses having led to “recognized environmental conditions” in connection with the Site. Only historical aerial photographs, topographic maps and oil/gas records were selected as pertinent historical sources to be reviewed during the completion of this Phase I ESA. Other historical resources such as city directories and fire insurance maps would not be useful in rendering an opinion regarding environmental conditions at the Site.

4.4.1 Aerial Photographs and Topographic Maps

CYA reviewed historical aerial photographs from the years 1947, 1952, 1959, 1967, 1969, 1977, 1980, 1994, 2003, 2005, 2009, 2010, 2012, and 2014 and topographic maps from the years 1903, 1908, 1916, 1924, 1925, 1927, 1929, 1930, 1933, 1939, 1940, 1943, 1948, 1953, 1958, 1964, 1965, 1967, 1970, 1980, 1984, 1992 and 2012, provided via online resources. On all of the aerial photographs and topographic maps, the Site appears to be vacant and undeveloped with no discernable feature except for portions of a few unimproved roads and/or trails. No significant environmental concerns in connection to the Site were noted during CYA's review of the historical aerial photographs and topographic maps.

4.4.2 State of California Division of Oil and Gas Records

According to online resources provided by the California Department of Conservation, Division of Oil, Gas and Geothermal Resources, there are no oil, gas or geothermal wells located on the Site.

4.5 Historical Use Information on Adjoining Properties

CYA also reviewed historical sources (as described in the following sections) to develop a history of the previous uses of adjoining properties and the surrounding area, in order to help identify the likelihood of past uses having led to "recognized environmental conditions" in connection with the Site.

4.5.1 Aerial Photographs and Topographic Maps

As stated previously, CYA reviewed historical aerial photographs from the years 1947, 1952, 1959, 1967, 1969, 1977, 1980, 1994, 2003, 2005, 2009, 2010, 2012, and 2014 and topographic maps from the years 1903, 1908, 1916, 1924, 1925, 1927, 1929, 1930, 1933, 1939, 1940, 1943, 1948, 1953, 1958, 1964, 1965, 1967, 1970, 1980, 1984, 1992 and 2012, provided via online resources. In the aerial photographs from 1947 to 1952, the surrounding properties appear vacant and undeveloped. In the 1959 to 1969 aerial photographs, a reservoir and a shooting range appear in the near vicinity to the west and south, respectively. Two pump stations (or ground disturbance in these areas) situated adjacent to the east and west of the Site, first appear in the 1967 aerial photograph. In the 1977 to 2014 aerial photographs, the adjacent properties appear generally in their current configurations.

The adjacent and surrounding properties appear predominantly vacant and undeveloped with a small track and limited structures on the topographic maps from 1903 to 1924. Structures are depicted in the vicinity of the two current pump stations situated adjacent to the east and west of the Site on the topographic maps from 1970 to 2012. No significant environmental concerns to the Site relative to adjacent and nearby properties were noted during the historical aerial photograph and topographic map review.

4.5.2 State of California Division of Oil and Gas Records

According to online resources provided by the California Department of Conservation, Division of Oil, Gas and Geothermal Resources, there are no oil, gas or geothermal wells located on adjoining properties of the Site.

5.0 SITE RECONNAISSANCE

The objective of the Site reconnaissance was to obtain information indicating the likelihood of “recognized environmental conditions” in connection with the Site. The reconnaissance was conducted on June 5, 2018, by CYA. CYA was unescorted during the Site reconnaissance.

5.1 Methodology and Limiting Conditions

The Site reconnaissance consisted of walking the Site and along public access roads (for viewing of adjacent/nearby properties). CYA was granted full access to the Site. However, the ground surface of some areas of the Site was obstructed from view by dense vegetation. Given the existing land uses of the Site, the lack of complete visibility of the surface area of the Site is not considered to be a data gap of significance. As stated previously, Site Plans are included in Appendix B. Photographs of the Site were taken to document existing Site conditions and several are included and described in Appendix C.

5.2 General Site Setting

The Site and its adjacent/nearby properties are situated within the Chatsworth community of Los Angeles, California and more specifically within Chatsworth Park South, which is owned and managed by the City of Los Angeles. The Site consists of multiple areas of varying sizes where future water infrastructure related work is proposed. These areas are situated in the central portion of Chatsworth Park south between the two aforementioned water pump stations. The majority of the areas are unimproved, vacant land. Remaining areas are portions of access roads and trails or consist of existing plumbing infrastructure. The current uses of the Site and its adjoining properties are not ones that are indicative of the use, treatment, storage, disposal or generation of significant quantities of hazardous substances or petroleum products that are resulting in active impacts to the Site.

5.3 Site Observations

CYA examined the Site for evidence of the following potential environmental concerns:

Conditions	Observed or Noted	Significant Concern?
Hazardous Substances/Petroleum Products	No	Not Applicable
Waste Generation/Storage/Disposal	No	Not Applicable
ASTs	No	Not Applicable
USTs	No	Not Applicable
PCB-Containing Equipment	No	Not Applicable
Chemical/Petroleum Odors	No	Not Applicable
Pools of Liquid	No	Not Applicable
Floor Drains/Sumps/Wells	No	Not Applicable
Drums	No	Not Applicable
Stains or Corrosion	No	Not Applicable

Conditions	Observed or Noted	Significant Concern?
Unidentified Substance Containers	No	Not Applicable
Stained Soil or Pavement	No	Not Applicable
Stressed Vegetation	No	Not Applicable
Pits, Ponds or Lagoons	No	Not Applicable
Wastewater Discharges/Disposal Systems	No	Not Applicable
Septic Systems/Cesspools	No	Not Applicable
Non-Hazardous Solid Waste Disposal Areas	No	Not Applicable
Drinking Water Systems/Water Wells/Other Wells	No	Not Applicable

No remarkable observations relative to potential environmental concerns were noted during the Site reconnaissance.

6.0 INTERVIEW INFORMATION

6.1 Interview With Owner

As stated previously, ownership of the Site parcels is as follows:

- APN 2723-010-094 - City of Los Angeles
- APN 2723-010-270 - Calleguas Municipal Water District
- APN 2723-010-902 - Metropolitan Water District
- APN 2723-010-903 - Metropolitan Water District

During the completion of this Phase I ESA, environmental questionnaires were provided to the Site owners for completion. At the time of this report, completed questionnaires have not been returned to CYA. Given the information available pertaining to the historical assessment and remedial work completed at the overall park property, of which the Site is a part, the lack of interviews with Site owners is not anticipated to be a data gap of significance. However, in the event that the Site owners are available to be interviewed verbally or by way of environmental questionnaires in the future, CYA can and will conduct the interviews at the request of the client.

6.2 Interview With Site Manager

The Site owners are also considered to be the Site Managers. Please refer to Section 6.1 above.

6.3 Interviews With Occupants

The Site has no known long-term occupants.

6.4 Interview With Local Government Official

During the preparation of this assessment, a representative of the DTSC was contacted regarding the status of the regulatory case for the overall park property of which the Site is a part. CYA was informed that while the RACR for the property has been accepted and approved, the LUC has yet to be executed by the City of Los Angeles and the DTSC.

6.5 Interview With Others

No other interviews were conducted as a part of this assessment.

7.0 FINDINGS, OPINION AND CONCLUSIONS AND RECOMMENDATIONS

This ESA has revealed no evidence of current “recognized environmental conditions” in connection with the Site and no basis to consider non-ASTM scope issues (e.g., asbestos containing materials, lead-based paint, etc.). Historical impacts at the Site and its adjacent properties resulting from the former firing range activity to the south of the Site are considered to be a “controlled recognized environmental condition” that does not warrant additional assessment at this time.

As stated previously, although the subject Site was not considered to be significantly impacted and was not subject to remedial activities, the forthcoming LUC and OMP to be executed between the City and the DTSC may still apply to the Site as it is part of the overall Chatsworth Park South property. Until such time that the Site is formally excluded from the LUC and OMP, all work performed in support of the Valley West Feeder No. 1 Access Road project shall comply with DTSCs directives relative to the RAP and the park.

In addition, while the reportedly abandoned six-inch oil pipeline in proximity to the Site limits was not deemed to be of environmental concern during prior assessment and remedial work completed under DTSC oversight, and no reports of a release of petroleum products from the pipeline have been reported, CYA cannot comment on actual subsurface conditions in the area of the pipeline. While CYA does not consider the pipeline to be a “recognized environmental condition” in connection with the Site, the client may desire a higher level of confidence regarding underlying subsurface conditions in its vicinity. If so, it should consider additional evaluation. CYA has confirmed that the pipeline is maintained by Crimson Pipeline L.P. (Crimson), and Crimson has provided support documentation relative to the location of the pipeline. Crimson recommends that it be contacted either directly or via USA when Site construction activities begin in the area.

8.0 DEVIATIONS AND DATA GAPS

No deviations or data gaps of significance as defined in the ASTM Standard are noted.

REFERENCES

“All Appropriate Inquiry” as necessary to satisfy the defenses available under 42 USC §§ 9607(b)(3), 9607(r)(1), and 9607(q), relying on definitions provided at 42 USC §§ 9601(35)(B); and as further explained in 40 CFR §§ 312.1 - 312.31.

ASTM International, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, ASTM Designation E1527-13, Published November 2013.

California State Water Resources Control Board, GeoTracker online database: <http://www.geotracker.swrcb.ca.gov>.

EDR Radius Map Report dated June 4, 2018.

State of California Department of Conservation, Division of Oil and Gas and Geothermal Resources: http://www.consrv.ca.gov/DOG/maps/index_map.htm.

USGS Topographic Map, Los Angeles, California Oat Mountain Quadrangle (2015).

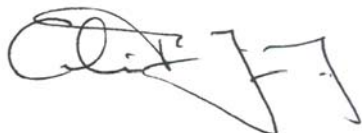
California State Water Resources Control Board, Water Quality Control Plan for the Los Angeles Basin (4), Los Angeles, California, Published 1994.

URS, Remedial Action Plan, Chatsworth Park South, Chatsworth, California, dated Feb 15, 2013 (Revised March 15, 2013).

URS, Remedial Action Completion Report, Chatsworth Park South, Chatsworth, California, dated December 20, 2016.

SIGNATURES AND QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

We declare that, to the best of our professional knowledge and belief, we meet the definition of "Environmental Professional" as defined in 40 CFR 312.10. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject Site. We have developed and performed the "all appropriate inquiries" in conformance with the standards and practices set forth in 40 CFR Part 312.



Colin P. Young, CIH
Principal

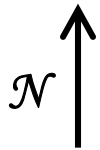


Daniel Weis, R.E.H.S.
Associate Environmental Scientist

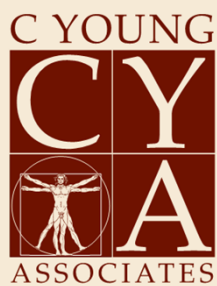
Environmental professional qualifications are included in Appendix G.

APPENDICES

Appendix A
Vicinity Map and Topographic Map



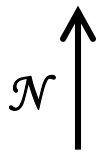
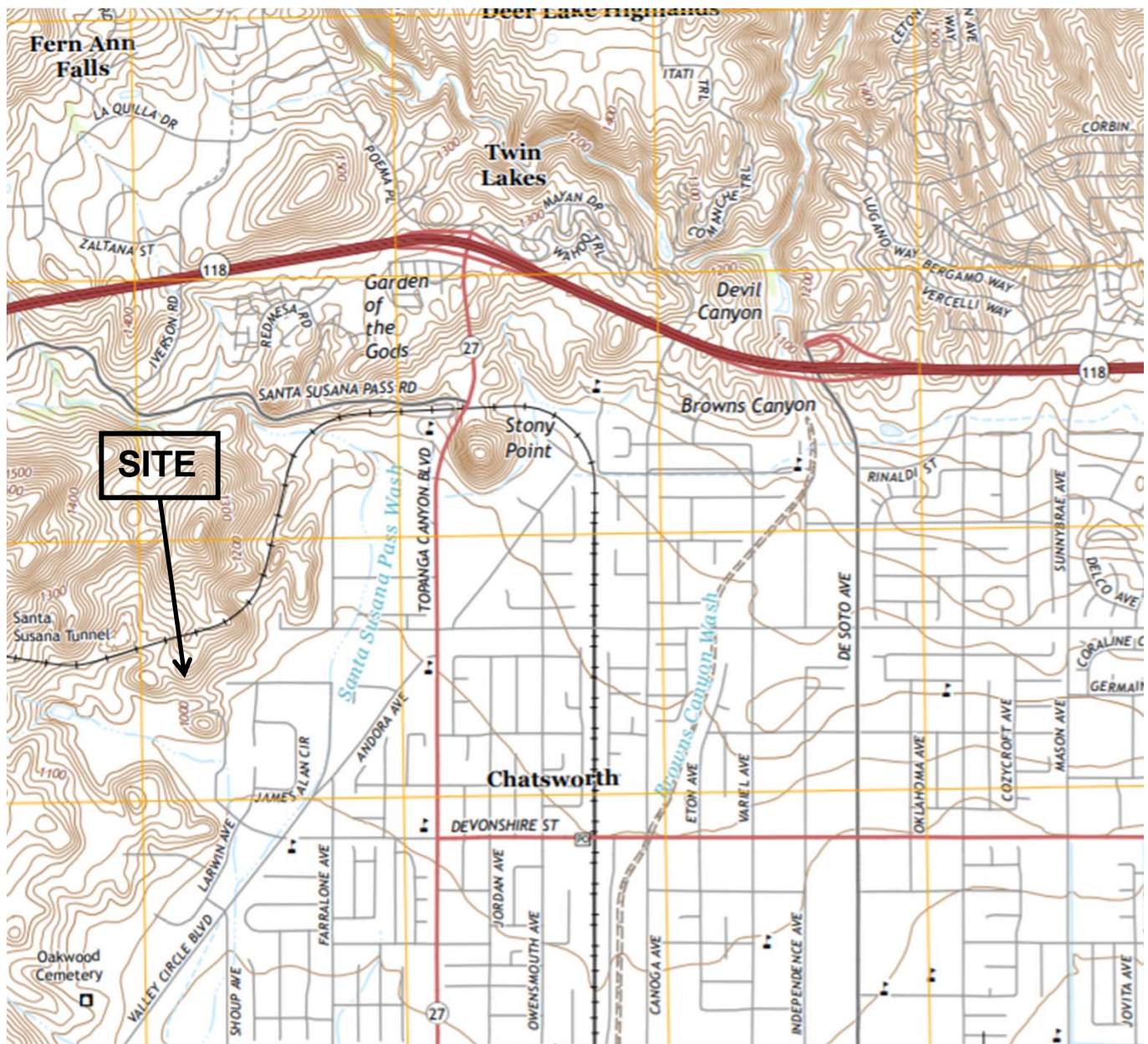
Not to Scale



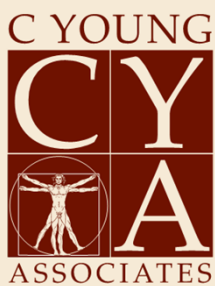
C Young Associates
1042 Skylark Drive
La Jolla, CA 92037

Vicinity Map

West Valley Feeder No. 1 Stage 3 Improvements
Los Angeles County, California



Not to Scale

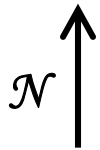
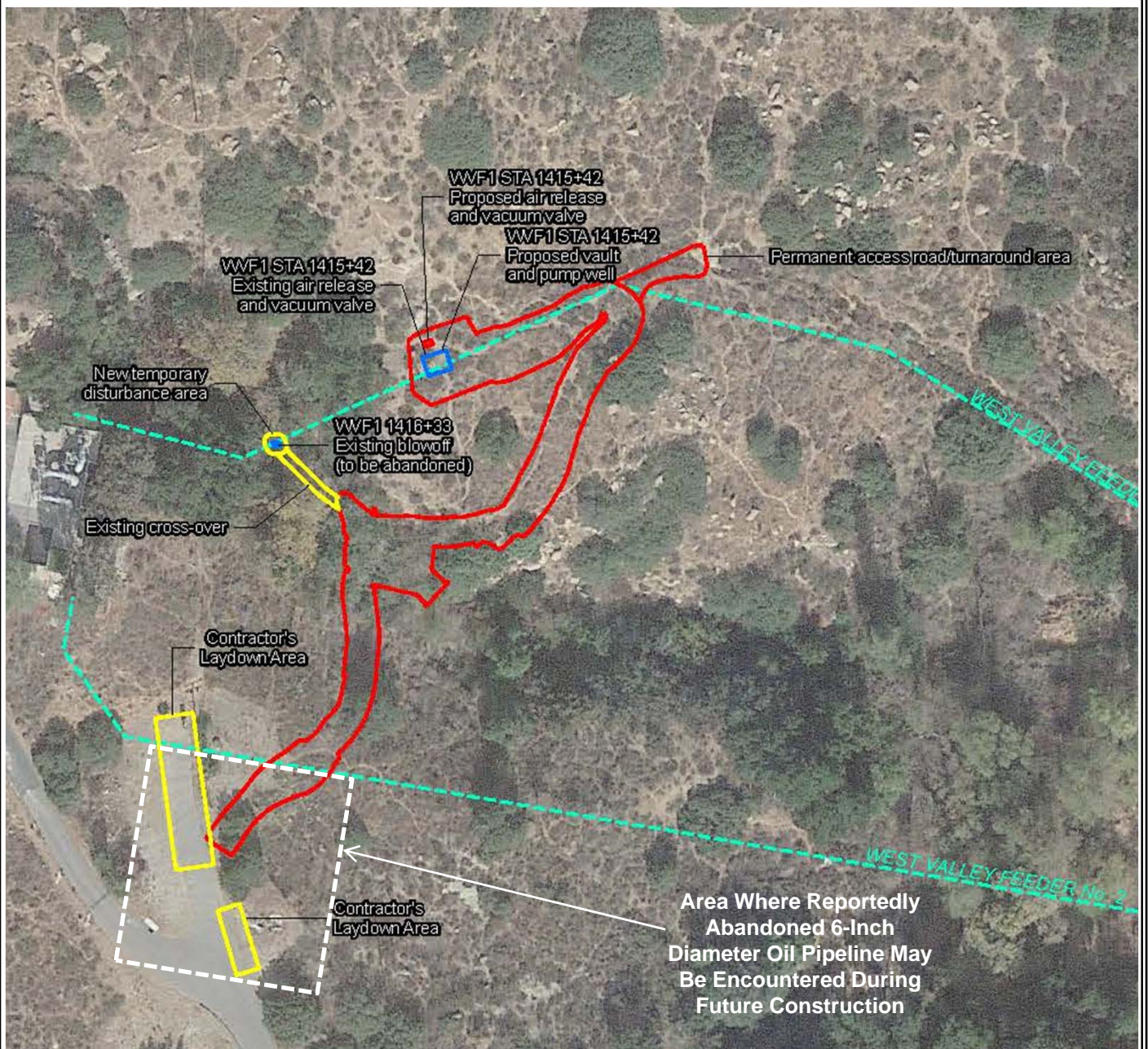


C Young Associates
1042 Skylark Drive
La Jolla, CA 92037

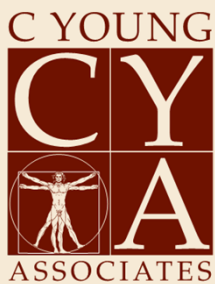
Topographic Map
West Valley Feeder No. 1 Stage 3 Improvements
Los Angeles County, California

Appendix B

Site Plans

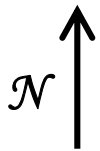


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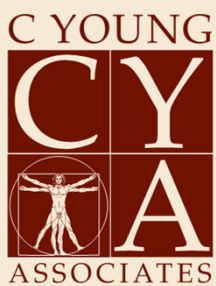


C Young Associates
1042 Skylark Drive
La Jolla, CA 92037

Site Plan #1
West Valley Feeder No. 1 Stage 3 Improvements
Los Angeles County, California

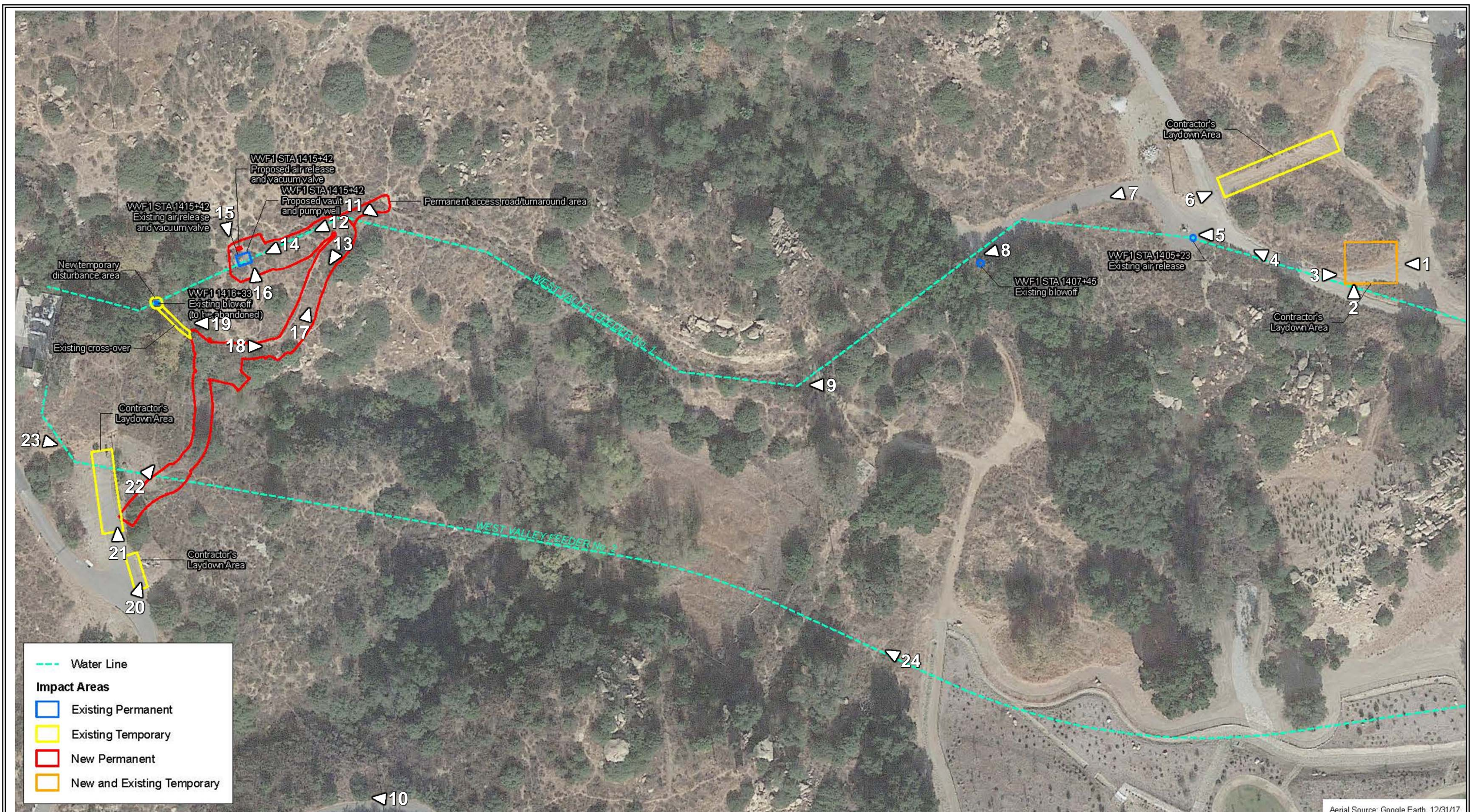


Not to Scale



C Young Associates
1042 Skylark Drive
La Jolla, CA 92037

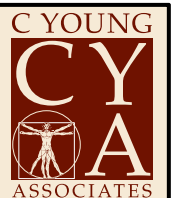
Site Plan #2
West Valley Feeder No. 1 Stage 3 Improvements
Los Angeles County, California



Site Plan #3 - West Valley Feeder No. 1 Stage 3 Improvements, Los Angeles County, California

24 Photograph Reference

C Young Associates
1042 Skylark Drive
La Jolla, CA 92037



Appendix C
Site Photographs

PHOTO 1.

View west at Contractor's Laydown Area
40' X 50' (Partially Undisturbed Area).



PHOTO 2.

View north at Contractor's Laydown Area
40' X 50' (Partially Undisturbed Area).



PHOTO 3.

View east at Contractor's Laydown Area
40' X 50' (Partially Undisturbed Area).



PHOTO 4.

View northwest along West Valley Feeder No. 1
Near WVF1 STA 1405+23.



PHOTO 5.

View west at WVF1 STA 1405+23 Existing air
release.



PHOTO 6.

View northeast at the Contractor's Laydown Area
20' X 120'.



PHOTO 7.

View west along asphalt paved access to WVF1
STA 1407+45 Existing Blowoff.



PHOTO 8.

View of WVF1 STA 1407+45 Existing Blowoff



PHOTO 9.

View west along West Valley Feeder No. 1.



PHOTO 10.

Off-Site signage indicating the presence of hazardous substances in the area.



PHOTO 11.

View southeast along West Valley Feeder No. 1 near the permanent access road/turnaround area.



PHOTO 12.

View southwest along West Valley Feeder No. 1, facing WVF1 STA 1415+42.



PHOTO 13.

View southwest along proposed new permanent access road.



PHOTO 14.

View southwest along West Valley Feeder No. 1, facing WVF1 STA 1415+42.



PHOTO 15.

View south near WVF1 STA 1415+42, existing air release and vacuum valve.



PHOTO 16.

View north near WVF1 STA 1415+42, proposed vault and pump well.



PHOTO 17.

View northeast along proposed new permanent access road.



PHOTO 18.

View east along proposed new permanent access road.



PHOTO 19.

View west near WVF1 1416+33, existing blowoff (to be abandoned).



PHOTO 20.

View north at contractor's laydown area 12' X 35'



PHOTO 21.

View north at contractor's laydown area 20' X 80'



PHOTO 22.

View northeast along proposed new permanent access road.



PHOTO 23.

View east along West Valley Feeder No. 2 near contractor's laydown area 20' X 80'.



PHOTO 24.

View west along West Valley Feeder No. 2.



Appendix D
Regulatory Database Report

West Valley Feeder No. 1 Stage 3 Improvements Project

22360 West Devonshire Street
Chatsworth, CA 91311

Inquiry Number: 5375619.1s
July 27, 2018

The EDR Radius Map™ Report



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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<u>SECTION</u>	<u>PAGE</u>
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	8
Orphan Summary	26
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

GeoCheck - Not Requested

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

22360 WEST DEVONSHIRE STREET
CHATSWORTH, CA 91311

COORDINATES

Latitude (North): 34.2619540 - 34° 15' 43.03"
Longitude (West): 118.6210480 - 118° 37' 15.77"
Universal Transverse Mercator: Zone 11
UTM X (Meters): 350750.1
UTM Y (Meters): 3792195.0
Elevation: 1035 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5630759 OAT MOUNTAIN, CA
Version Date:	2012
Southeast Map:	5630737 CANOGA PARK, CA
Version Date:	2012
Southwest Map:	5630735 CALABASAS, CA
Version Date:	2012
Northwest Map:	5630769 SIMI VALLEY EAST, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from: 20140531
Source: USDA

MAPPED SITES SUMMARY

Target Property Address:
22360 WEST DEVONSHIRE STREET
CHATSWORTH, CA 91311

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	CHATSWORTH PARK SOUT	22360 DEVONSHIRE STR	NPDES		TP
A2	CHATSWORTH PARK SOUT	22360 DEVONSHIRE ST	ENVIROSTOR, VCP, HAZNET, CIWQS		TP
3	CHIME CHARTER MIDDLE	22280 DEVONSHIRE STR	ENVIROSTOR, SCH	Lower	2616, 0.495, ESE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
CHATSWORTH PARK SOUT 22360 DEVONSHIRE STR CHATSWORTH, CA 91311	NPDES Facility Status: Active	N/A
CHATSWORTH PARK SOUT 22360 DEVONSHIRE ST CHATSWORTH, CA 91311	ENVIROSTOR Facility Id: 60000893 Status: Active VCP Status: Active Facility Id: 60000893 HAZNET GEPAID: CAP000263467 GEPAID: CAC002721760 CIWQS	N/A

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

EXECUTIVE SUMMARY

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-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS..... Land Use Control Information System

US ENG CONTROLS..... Engineering Controls Sites List

US INST CONTROL..... Sites with Institutional Controls

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

INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Considered Brownfields Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

EXECUTIVE SUMMARY

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
DEBRIS REGION 9.....	Torres Martinez Reservation Illegal Dump Site Locations
ODI.....	Open Dump Inventory
IHS OPEN DUMPS.....	Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL.....	Delisted National Clandestine Laboratory Register
AOCONCERN.....	San Gabriel Valley Areas of Concern
HIST Cal-Sites.....	Historical Calsites Database
SCH.....	School Property Evaluation Program
CDL.....	Clandestine Drug Labs
Toxic Pits.....	Toxic Pits Cleanup Act Sites
US CDL.....	National Clandestine Laboratory Register
CERS HAZ WASTE.....	CERS HAZ WASTE

Local Lists of Registered Storage Tanks

SWEEPS UST.....	SWEEPS UST Listing
HIST UST.....	Hazardous Substance Storage Container Database
CA FID UST.....	Facility Inventory Database
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

EXECUTIVE SUMMARY

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
UXO.....	Unexploded Ordnance Sites
DOCKET HWC.....	Hazardous Waste Compliance Docket Listing
ECHO.....	Enforcement & Compliance History Information
FUELS PROGRAM.....	EPA Fuels Program Registered Listing
CA BOND EXP. PLAN.....	Bond Expenditure Plan
Cortese.....	"Cortese" Hazardous Waste & Substances Sites List
CUPA Listings.....	CUPA Resources List
DRYCLEANERS.....	Cleaner Facilities
EMI.....	Emissions Inventory Data
ENF.....	Enforcement Action Listing
Financial Assurance.....	Financial Assurance Information Listing
ICE.....	ICE
HIST CORTESE.....	Hazardous Waste & Substance Site List
LOS ANGELES CO. HMS.....	HMS: Street Number List
HWP.....	EnviroStor Permitted Facilities Listing
HWT.....	Registered Hazardous Waste Transporter Database
MINES.....	Mines Site Location Listing
MWMP.....	Medical Waste Management Program Listing
PEST LIC.....	Pesticide Regulation Licenses Listing
PROC.....	Certified Processors Database
Notify 65.....	Proposition 65 Records
LA Co. Site Mitigation.....	Site Mitigation List
UIC.....	UIC Listing
WASTEWATER PITS.....	Oil Wastewater Pits Listing
WDS.....	Waste Discharge System
WIP.....	Well Investigation Program Case List
MILITARY PRIV SITES.....	MILITARY PRIV SITES (GEOTRACKER)
UIC GEO.....	UIC GEO (GEOTRACKER)
CERS.....	CERS
WELL STIM PROJ.....	Well Stimulation Project (GEOTRACKER)
SAMPLING POINT.....	SAMPLING POINT (GEOTRACKER)

EXECUTIVE SUMMARY

OTHER OIL GAS..... OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS..... PROD WATER PONDS (GEOTRACKER)
PROJECT..... PROJECT (GEOTRACKER)
NON-CASE INFO..... NON-CASE INFO (GEOTRACKER)

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
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 identifies 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 04/30/2018 has revealed that there is 1 ENVIROSTOR site within approximately 1 mile of the target property.

EXECUTIVE SUMMARY

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
CHIME CHARTER MIDDLE Facility Id: 70000135 Status: No Further Action	22280 DEVONSHIRE STR	ESE 1/4 - 1/2 (0.495 mi.)	3	23

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

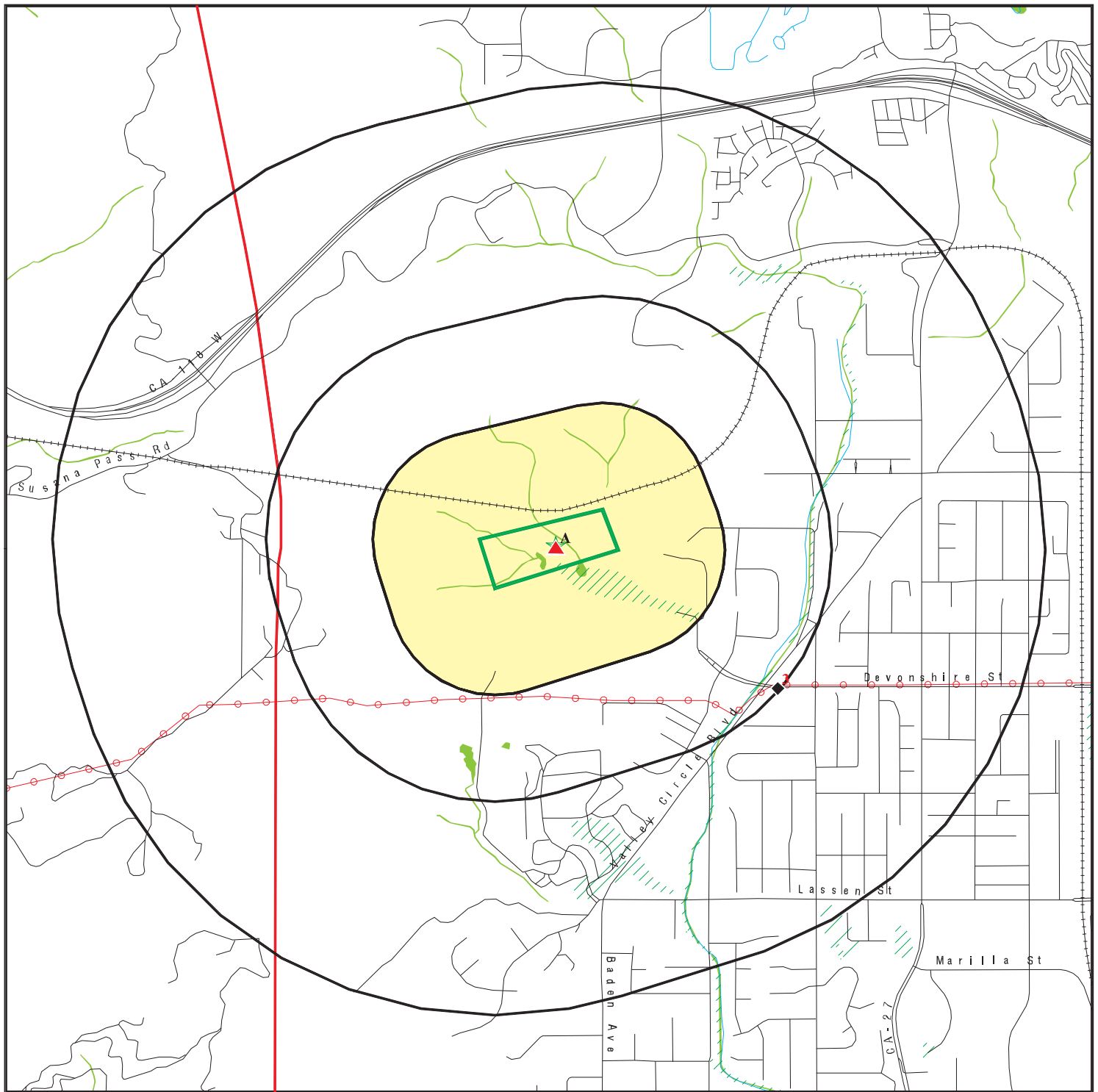
Site Name

JIM DANDY DRY CLEANERS,JULIUS ALLI


Database(s)


DRYCLEANERS

OVERVIEW MAP - 5375619.1S



 Target Property

 Sites at elevations higher than or equal to the target property

 Sites at elevations lower than the target property

 Manufactured Gas Plants

 National Priority List Sites

 Dept. Defense Sites

 Indian Reservations BIA

 County Boundary


 Power transmission lines

 100-year flood zone

 500-year flood zone

 National Wetland Inventory

 State Wetlands

 Areas of Concern

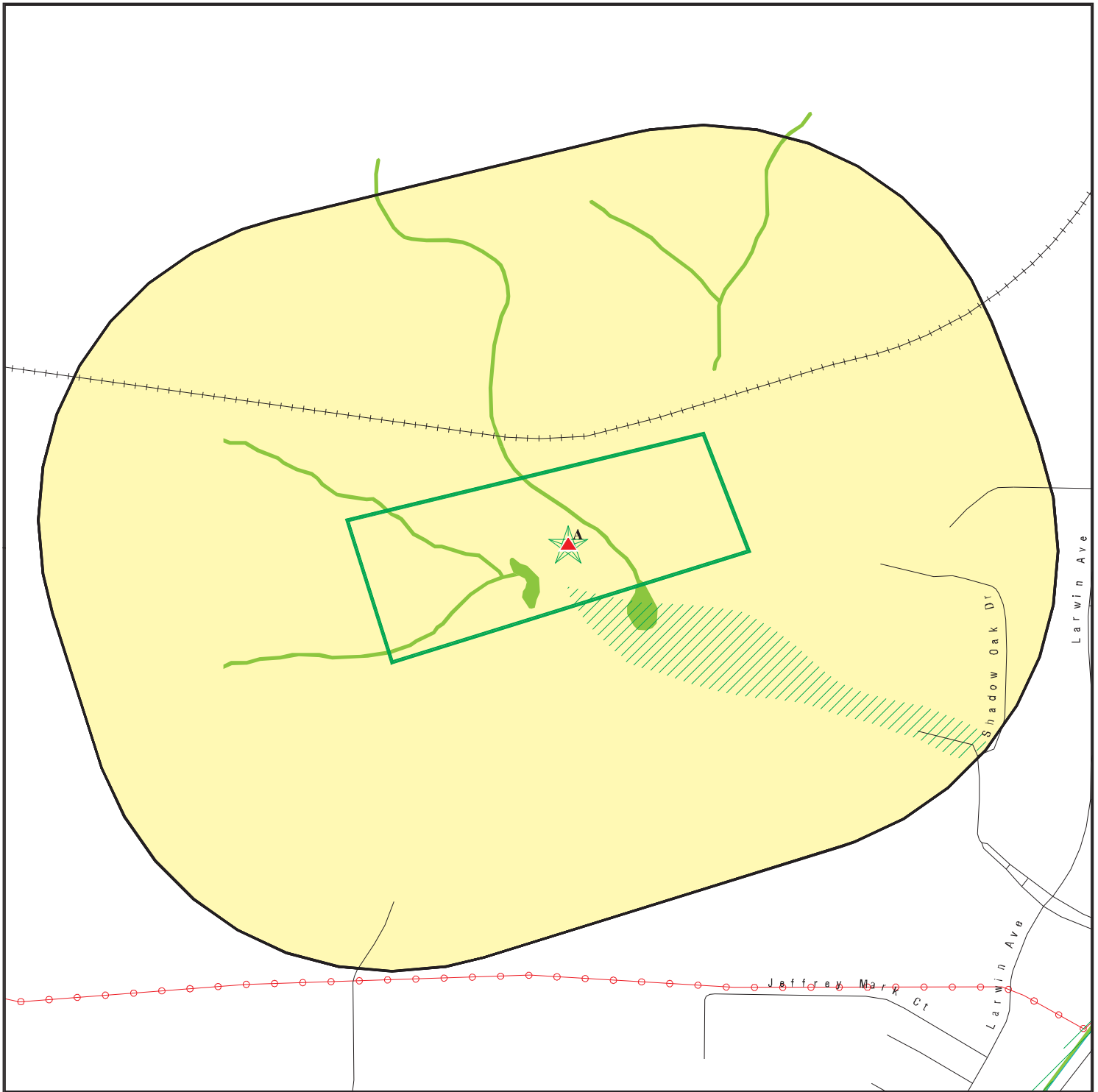
0 1/4 1/2 1 Miles

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: West Valley Feeder No. 1 Stage 3 Improvements Project
ADDRESS: 22360 West Devonshire Street
Chatsworth CA 91311
LAT/LONG: 34.261954 / 118.621048

CLIENT: C Young Associates
CONTACT: Daniel Weis
INQUIRY #: 5375619.1s
DATE: July 27, 2018 5:29 pm

DETAIL MAP - 5375619.1S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

Power transmission lines

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

Areas of Concern

0 1/16 1/8 1/4 Miles



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: West Valley Feeder No. 1 Stage 3 Improvements Project
ADDRESS: 22360 West Devonshire Street
Chatsworth CA 91311
LAT/LONG: 34.261954 / 118.621048

CLIENT: C Young Associates
CONTACT: Daniel Weis
INQUIRY #: 5375619.1s
DATE: July 27, 2018 5:31 pm

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								
<i>Federal NPL site list</i>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
<i>Federal Delisted NPL site list</i>								
Delisted NPL	1.000		0	0	0	0	NR	0
<i>Federal CERCLIS list</i>								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
<i>Federal CERCLIS NFRAP site list</i>								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
<i>Federal RCRA CORRACTS facilities list</i>								
CORRACTS	1.000		0	0	0	0	NR	0
<i>Federal RCRA non-CORRACTS TSD facilities list</i>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<i>Federal RCRA generators list</i>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
<i>Federal institutional controls / engineering controls registries</i>								
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
<i>Federal ERNS list</i>								
ERNS	0.001		0	NR	NR	NR	NR	0
<i>State- and tribal - equivalent NPL</i>								
RESPONSE	1.000		0	0	0	0	NR	0
<i>State- and tribal - equivalent CERCLIS</i>								
ENVIROSTOR	1.000	1	0	0	1	0	NR	2
<i>State and tribal landfill and/or solid waste disposal site lists</i>								
SWF/LF	0.500		0	0	0	NR	NR	0
<i>State and tribal leaking storage tank lists</i>								
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								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500	1	0	0	0	NR	NR	1
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
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	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
AOCONCERN	1.000		0	0	0	0	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
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0
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	0.001		0	NR	NR	NR	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	0.001		0	NR	NR	NR	NR	0
FINDS	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
ECHO	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		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
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	1	0	NR	NR	NR	NR	1
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
LOS ANGELES CO. HMS	0.001		0	NR	NR	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.001		0	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001	1	0	NR	NR	NR	NR	1
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
LA Co. Site Mitigation	0.001		0	NR	NR	NR	NR	0
UIC	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
CIWQS	0.001	1	0	NR	NR	NR	NR	1
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	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
PROJECT	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	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 --		5	0	0	1	0	0	6
-------------	--	---	---	---	---	---	---	---

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

A1
Target
Property

CHATSWORTH PARK SOUTH
22360 DEVONSHIRE STREET
CHATSWORTH, CA 91311

NPDES **S118590651**
N/A

Site 1 of 2 in cluster A

Actual:
1035 ft.

NPDES:

Facility Status: Active
NPDES Number: CAS000002
Region: 4
Agency Number: 0
Regulatory Measure ID: 471130
Place ID: Not reported
Order Number: 2009-0009-DWQ
WDID: 4 19C375884
Regulatory Measure Type: Enrollee
Program Type: Construction
Adoption Date Of Regulatory Measure: Not reported
Effective Date Of Regulatory Measure: 04/05/2016
Termination Date Of Regulatory Measure: Not reported
Expiration Date Of Regulatory Measure: Not reported
Discharge Address: 221 N Figueroa Street
Discharge Name: Department of Recreation and Parks
Discharge City: Los Angeles
Discharge State: California
Discharge Zip: 90012
Status: Not reported
Status Date: Not reported
Operator Name: Not reported
Operator Address: Not reported
Operator City: Not reported
Operator State: Not reported
Operator Zip: Not reported

NPDES as of 03/2018:

NPDES Number: Not reported
Status: Not reported
Agency Number: Not reported
Region: 4
Regulatory Measure ID: 471130
Order Number: Not reported
Regulatory Measure Type: Construction
Place ID: Not reported
WDID: 4 19C375884
Program Type: Not reported
Adoption Date Of Regulatory Measure: Not reported
Effective Date Of Regulatory Measure: Not reported
Expiration Date Of Regulatory Measure: Not reported
Termination Date Of Regulatory Measure: Not reported
Discharge Name: Not reported
Discharge Address: Not reported
Discharge City: Not reported
Discharge State: Not reported
Discharge Zip: Not reported
Received Date: 03/31/2016
Processed Date: 04/05/2016
Status: Active
Status Date: 04/05/2016
Place Size: 81
Place Size Unit: Acres

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S118590651

Contact:	Paul Davis
Contact Title:	Not reported
Contact Phone:	213-202-2667
Contact Phone Ext:	Not reported
Contact Email:	Paul.J.Davis@lacity.org
Operator Name:	Department of Recreation and Parks
Operator Address:	221 N Figueroa Street
Operator City:	Los Angeles
Operator State:	California
Operator Zip:	90012
Operator Contact:	Paul Davis
Operator Contact Title:	Environmental Supervisor
Operator Contact Phone:	213-202-2681
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Paul.J.Davis@lacity.org
Operator Type:	County Agency
Developer:	American Integrated Services Inc
Developer Address:	1502 Opp Street
Developer City:	Wilmington
Developer State:	California
Developer Zip:	90744
Developer Contact:	Nathan Stanley
Developer Contact Title:	Dir. of Preconstruction
Constype Linear Utility Ind:	N
Emergency Phone:	951-907-8952
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commercial Ind:	N
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Remediation and park
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Not reported
Constype Utility Ind:	N
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Indirect discharge
Certifier:	Paul Davis
Certifier Title:	Environmental Supervisor
Certification Date:	30-NOV-16
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000002
Status:	Active
Agency Number:	0
Region:	4
Regulatory Measure ID:	471130
Order Number:	2009-0009-DWQ

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S118590651

Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	4 19C375884
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/05/2016
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Department of Recreation and Parks
Discharge Address:	221 N Figueroa Street
Discharge City:	Los Angeles
Discharge State:	California
Discharge Zip:	90012
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commercial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S118590651

Constype Transport Ind: Not reported
Constype Utility Description: Not reported
Constype Utility Ind: Not reported
Constype Water Sewer Ind: Not reported
Dir Discharge Uswater Ind: Not reported
Receiving Water Name: Not reported
Certifier: Not reported
Certifier Title: Not reported
Certification Date: Not reported
Primary Sic: Not reported
Secondary Sic: Not reported
Tertiary Sic: Not reported

Facility Status: Not reported
NPDES Number: Not reported
Region: Not reported
Agency Number: Not reported
Regulatory Measure ID: Not reported
Place ID: Not reported
Order Number: Not reported
WDID: 4 19C375884
Regulatory Measure Type: Construction
Program Type: Not reported
Adoption Date Of Regulatory Measure: Not reported
Effective Date Of Regulatory Measure: Not reported
Termination Date Of Regulatory Measure: Not reported
Expiration Date Of Regulatory Measure: Not reported
Discharge Address: Not reported
Discharge Name: Not reported
Discharge City: Not reported
Discharge State: Not reported
Discharge Zip: Not reported
Status: Active
Status Date: 09/14/2017
Operator Name: Department of Recreation and Parks
Operator Address: 221 N Figueroa Street
Operator City: Los Angeles
Operator State: California
Operator Zip: 90012

NPDES as of 03/2018:
NPDES Number: Not reported
Status: Not reported
Agency Number: Not reported
Region: 4
Regulatory Measure ID: 471130
Order Number: Not reported
Regulatory Measure Type: Construction
Place ID: Not reported
WDID: 4 19C375884
Program Type: Not reported
Adoption Date Of Regulatory Measure: Not reported
Effective Date Of Regulatory Measure: Not reported
Expiration Date Of Regulatory Measure: Not reported
Termination Date Of Regulatory Measure: Not reported
Discharge Name: Not reported
Discharge Address: Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S118590651

Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	03/31/2016
Processed Date:	04/05/2016
Status:	Active
Status Date:	04/05/2016
Place Size:	81
Place Size Unit:	Acres
Contact:	Paul Davis
Contact Title:	Not reported
Contact Phone:	213-202-2667
Contact Phone Ext:	Not reported
Contact Email:	Paul.J.Davis@lacity.org
Operator Name:	Department of Recreation and Parks
Operator Address:	221 N Figueroa Street
Operator City:	Los Angeles
Operator State:	California
Operator Zip:	90012
Operator Contact:	Paul Davis
Operator Contact Title:	Environmental Supervisor
Operator Contact Phone:	213-202-2681
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Paul.J.Davis@lacity.org
Operator Type:	County Agency
Developer:	American Integrated Services Inc
Developer Address:	1502 Opp Street
Developer City:	Wilmington
Developer State:	California
Developer Zip:	90744
Developer Contact:	Nathan Stanley
Developer Contact Title:	Dir. of Preconstruction
Constype Linear Utility Ind:	N
Emergency Phone:	951-907-8952
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commercial Ind:	N
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Remediation and park
Constype Other Ind:	N
Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Not reported
Constype Utility Ind:	N
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Indirect discharge
Certifier:	Paul Davis
Certifier Title:	Environmental Supervisor
Certification Date:	30-NOV-16
Primary Sic:	Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S118590651

Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000002
Status:	Active
Agency Number:	0
Region:	4
Regulatory Measure ID:	471130
Order Number:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	4 19C375884
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/05/2016
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Department of Recreation and Parks
Discharge Address:	221 N Figueroa Street
Discharge City:	Los Angeles
Discharge State:	California
Discharge Zip:	90012
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S118590651

Constype Comm Line Ind:	Not reported
Constype Commercial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

A2
Target
Property

CHATSWORTH PARK SOUTH
22360 DEVONSHIRE ST
CHATSWORTH, CA 91311

ENVIROSTOR
VCP
HAZNET
CIWQS

S109034309
N/A

Site 2 of 2 in cluster A

Actual:
1035 ft.

ENVIROSTOR:

Facility ID:	60000893
Status:	Active
Status Date:	03/03/2010
Site Code:	301384
Site Type:	Voluntary Cleanup
Site Type Detailed:	Voluntary Cleanup
Acres:	81
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Chand Sultana
Supervisor:	Allan Plaza
Division Branch:	Cleanup Chatsworth
Assembly:	38
Senate:	27
Special Program:	Voluntary Cleanup Program
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	34.25814
Longitude:	-118.6148
APN:	NONE SPECIFIED
Past Use:	FIRING RANGE - SMALL ARMS ETC...
Potential COC:	Under Investigation Arsenic Dioxin (as 2,3,7,8-TCDD TEQ Lead Polynuclear aromatic hydrocarbons (PAHs
Confirmed COC:	30001-NO 30009-NO Lead Polynuclear aromatic hydrocarbons (PAHs 31001-NO
Potential Description:	SOIL, SURFW

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Alias Name: 301384
Alias Type: Project Code (Site Code)
Alias Name: 60000893
Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 09/08/2008
Comments: Proponent signed VCA

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 07/23/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: State/Federal Funded Site Contract
Completed Date: 04/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/25/2014
Comments: 2014-2015 Estimated Oversight Costs

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/11/2015
Comments: completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/15/2016
Comments: Annual Cost Estimate Letter sent out

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/28/2017
Comments: 2017-2018 Annual Oversight Cost Estimate

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: State/Federal Funded Site Work Order
Completed Date: 01/25/2010
Comments: Start Work issued.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 03/04/2010

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 01/10/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Application
Completed Date: 09/28/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Workplan
Completed Date: 03/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 04/28/2010
Comments: HHRA Report approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 09/23/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 07/23/2013
Comments: The RAP has specified remedial action objectives, evaluated alternatives, and described the alternative proposed for the Site. The objective of the RAP is to mitigate potential risk from the contaminants in soil that may pose a threat to human health and the environment. DTSC received 50 comments during the public comment period held between March 21, 2013 to April 22, 2013 and at the public meeting held on April 2, 2013. Subsequently, a Responses to Comments (RTCs) document was prepared and sent to each commenter who provided an e-mail or a physical address. In addition, as a part of the approval process, DTSC prepared Responsible Agency Checklist and filed a Notice of Determination (NOD) document with the Office of Planning and Research to comply with the California Environmental Quality Act (CEQA) requirements for this project. However, the City was the lead agency who fulfilled the requirements for the CEQA and prepared Initial Study/Mitigation Negative Declaration (IS/MND) documents and filed a NOD to adopt MND. They were also responsible for responding to public and agencies comments received on the IS/MND. Modification to the draft RAP was not necessary based on the comments received. DTSC approved the Report.

Completed Area Name: PROJECT WIDE

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 12/27/2012
Comments: Community Profile ready for public review.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 03/18/2013
Comments: Fact Sheet sent to the public. No formal DTSC letter required.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 05/30/2014
Comments: Tree removal done. Plan was submitted to DTSC for the record.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 10/25/2012
Comments: DTSC approved the Interim Action Plan for opening the recreation building.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 04/18/2017
Comments: RACR approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 03/18/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 12/30/2016
Comments: Field work completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 04/02/2015
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Work Notice
Completed Date: 04/04/2016
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Land Use Restriction

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Future Due Date: 2018
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2018
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Operations and Maintenance Plan
Future Due Date: 2018
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2022
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

VCP:

Facility ID: 60000893
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: NONE SPECIFIED
Acres: 81
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Chand Sultana
Supervisor: Allan Plaza
Division Branch: Cleanup Chatsworth
Site Code: 301384
Assembly: 38
Senate: 27
Special Programs Code: Voluntary Cleanup Program
Status: Active
Status Date: 03/03/2010
Restricted Use: NO
Funding: Responsible Party
Lat/Long: 34.25814 / -118.6148
APN: NONE SPECIFIED
Past Use: FIRING RANGE - SMALL ARMS ETC...
Potential COC: 31001, 30001, 30009, 30013, 30472
Confirmed COC: 30001-NO,30009-NO,30013,30472,31001-NO
Potential Description: SOIL, SURFW
Alias Name: 301384
Alias Type: Project Code (Site Code)
Alias Name: 60000893
Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 09/08/2008
Comments: Proponent signed VCA

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 07/23/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: State/Federal Funded Site Contract
Completed Date: 04/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/25/2014
Comments: 2014-2015 Estimated Oversight Costs

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/11/2015
Comments: completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/15/2016
Comments: Annual Cost Estimate Letter sent out

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/28/2017
Comments: 2017-2018 Annual Oversight Cost Estimate

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: State/Federal Funded Site Work Order
Completed Date: 01/25/2010
Comments: Start Work issued.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 03/04/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 01/10/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Application

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Completed Date: 09/28/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Workplan
Completed Date: 03/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 04/28/2010
Comments: HHRA Report approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 09/23/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 07/23/2013
Comments: The RAP has specified remedial action objectives, evaluated alternatives, and described the alternative proposed for the Site. The objective of the RAP is to mitigate potential risk from the contaminants in soil that may pose a threat to human health and the environment. DTSC received 50 comments during the public comment period held between March 21, 2013 to April 22, 2013 and at the public meeting held on April 2, 2013. Subsequently, a Responses to Comments (RTCs) document was prepared and sent to each commenter who provided an e-mail or a physical address. In addition, as a part of the approval process, DTSC prepared Responsible Agency Checklist and filed a Notice of Determination (NOD) document with the Office of Planning and Research to comply with the California Environmental Quality Act (CEQA) requirements for this project. However, the City was the lead agency who fulfilled the requirements for the CEQA and prepared Initial Study/Mitigation Negative Declaration (IS/MND) documents and filed a NOD to adopt MND. They were also responsible for responding to public and agencies comments received on the IS/MND. Modification to the draft RAP was not necessary based on the comments received. DTSC approved the Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 12/27/2012
Comments: Community Profile ready for public review.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 03/18/2013
Comments: Fact Sheet sent to the public. No formal DTSC letter required.

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 05/30/2014
Comments: Tree removal done. Plan was submitted to DTSC for the record.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 10/25/2012
Comments: DTSC approved the Interim Action Plan for opening the recreation building.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 04/18/2017
Comments: RACR approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 03/18/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 12/30/2016
Comments: Field work completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 04/02/2015
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Work Notice
Completed Date: 04/04/2016
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Land Use Restriction
Future Due Date: 2018
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2018
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Operations and Maintenance Plan
Future Due Date: 2018
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Future Document Type: 5 Year Review Reports
Future Due Date: 2022
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

HAZNET:

envid: S109034309
Year: 2016
GEPAID: CAP000263467
Contact: PAUL DAVIS
Telephone: 2132022667
Mailing Name: Not reported
Mailing Address: 221 N FIGUEROA ST FL 4
Mailing City,St,Zip: LOS ANGELES, CA 900122639
Gen County: Los Angeles
TSD EPA ID: NVT330010000
TSD County: 99
Waste Category: Contaminated soil from site clean-up
Disposal Method: Other Recovery Of Reclamation For Reuse Including Acid Regeneration,
Organics Recovery Ect
Tons: 455.43
Cat Decode: Contaminated soil from site clean-up
Method Decode: Other Recovery Of Reclamation For Reuse Including Acid Regeneration,
Organics Recovery Ect
Facility County: Los Angeles

envid: S109034309
Year: 2013
GEPAID: CAC002721760
Contact: EMMANUEL AMES
Telephone: 2139783798
Mailing Name: Not reported
Mailing Address: 111 E FIRST ST RM 600
Mailing City,St,Zip: LOS ANGELES, CA 900120000
Gen County: Los Angeles
TSD EPA ID: CAD980675276
TSD County: Kern
Waste Category: Not reported
Disposal Method: Landfill Or Surface Impoundment That Will Be Closed As Landfill(To
Include On-Site Treatment And/Or Stabilization)
Tons: 0.42
Cat Decode: Not reported
Method Decode: Not reported
Facility County: Not reported

CIWQS:

Agency: Department of Recreation and Parks
Agency Address: 221 N Figueroa Street Suite 100, Los Angeles, CA 90012
Place/Project Type: Construction
SIC/NAICS: Not reported
Region: 4
Program: CONSTW
Regulatory Measure Status: Terminated

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHATSWORTH PARK SOUTH (Continued)

S109034309

Regulatory Measure Type: Storm water construction
Order Number: 2009-0009-DWQ
WDID: 4 19C375884
NPDES Number: CAS000002
Adoption Date: Not reported
Effective Date: 04/05/2016
Termination Date: 09/06/2017
Expiration/Review Date: Not reported
Design Flow: Not reported
Major/Minor: Not reported
Complexity: Not reported
TTWQ: Not reported
Enforcement Actions within 5 years: 0
Violations within 5 years: 0
Latitude: 34.25789
Longitude: -118.614375

3
ESE
1/4-1/2
0.495 mi.
2616 ft.

CHIME CHARTER MIDDLE SCHOOL
22280 DEVONSHIRE STREET
CHATSWORTH, CA 91311

ENVIROSTOR **S107736119**
SCH **N/A**

Relative:
Lower
Actual:
957 ft.

ENVIROSTOR:
Facility ID: 70000135
Status: No Further Action
Status Date: 04/27/2007
Site Code: 304518
Site Type: School Investigation
Site Type Detailed: School
Acres: 2.7
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach
Assembly: 38
Senate: 27
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 34.25668
Longitude: -118.6120
APN: NONE SPECIFIED
Past Use: NONE
Potential COC: Chlordane Lead Methane
Confirmed COC: NONE SPECIFIED
Potential Description: IA, SOIL, SV
Alias Name: 304518
Alias Type: Project Code (Site Code)
Alias Name: 70000135
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHIME CHARTER MIDDLE SCHOOL (Continued)

S107736119

Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 02/07/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 06/07/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 02/09/2006
Comments: PEAR for potential methane and LBP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 10/25/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 04/27/2007
Comments: Public review and comment from March 1, 2007 through March 30, 2007 and a public hearing was held on April 18, 2007

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:

Facility ID: 70000135
Site Type: School Investigation
Site Type Detail: School
Site Mgmt. Req.: NONE SPECIFIED
Acres: 2.7
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach
Site Code: 304518
Assembly: 38
Senate: 27
Special Program Status: Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

CHIME CHARTER MIDDLE SCHOOL (Continued)

S107736119

Status: No Further Action
Status Date: 04/27/2007
Restricted Use: NO
Funding: School District
Latitude: 34.25668
Longitude: -118.6120
APN: NONE SPECIFIED
Past Use: NONE
Potential COC: Chlordane, Lead, Methane
Confirmed COC: NONE SPECIFIED
Potential Description: IA, SOIL, SV
Alias Name: 304518
Alias Type: Project Code (Site Code)
Alias Name: 70000135
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: 02/07/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 06/07/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 02/09/2006
Comments: PEAR for potential methane and LBP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 10/25/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 04/27/2007
Comments: Public review and comment from March 1, 2007 through March 30, 2007 and a public hearing was held on April 18, 2007

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: 1 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
CHATSWORTH	S121700613	JIM DANDY DRY CLEANERS,JULIUS ALLI	17505 CHATSWORTH ST	91311	DRYCLEANERS

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: 05/13/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: N/A
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 23	Next Scheduled EDR Contact: 10/15/2018
	Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 05/13/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: N/A
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 23	Next Scheduled EDR Contact: 10/15/2018
	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	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 05/13/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: N/A
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 23	Next Scheduled EDR Contact: 10/15/2018
	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: 11/07/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/05/2017	Telephone: 703-603-8704
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 07/06/2018
Number of Days to Update: 92	Next Scheduled EDR Contact: 10/15/2018
	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 known 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: 05/18/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: 800-424-9346
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 23	Next Scheduled EDR Contact: 10/29/2018
	Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 05/18/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: 800-424-9346
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 23	Next Scheduled EDR Contact: 10/29/2018
	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: 03/01/2018	Source: EPA
Date Data Arrived at EDR: 03/28/2018	Telephone: 800-424-9346
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 06/28/2018
Number of Days to Update: 86	Next Scheduled EDR Contact: 10/08/2018
	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: 03/01/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/28/2018	Telephone: (415) 495-8895
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 06/28/2018
Number of Days to Update: 86	Next Scheduled EDR Contact: 10/08/2018
	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: 03/01/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/28/2018	Telephone: (415) 495-8895
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 06/28/2018
Number of Days to Update: 86	Next Scheduled EDR Contact: 10/08/2018
	Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 03/01/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/28/2018	Telephone: (415) 495-8895
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 06/28/2018
Number of Days to Update: 86	Next Scheduled EDR Contact: 10/08/2018
	Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/28/2018	Telephone: (415) 495-8895
Date Made Active in Reports: 06/22/2018	Last EDR Contact: 06/28/2018
Number of Days to Update: 86	Next Scheduled EDR Contact: 10/08/2018
	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: 05/14/2018	Source: Department of the Navy
Date Data Arrived at EDR: 05/18/2018	Telephone: 843-820-7326
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/09/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/27/2018
	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: 02/13/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/27/2018	Telephone: 703-603-0695
Date Made Active in Reports: 05/11/2018	Last EDR Contact: 05/29/2018
Number of Days to Update: 73	Next Scheduled EDR Contact: 09/10/2018
	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: 02/13/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/27/2018	Telephone: 703-603-0695
Date Made Active in Reports: 05/11/2018	Last EDR Contact: 05/29/2018
Number of Days to Update: 73	Next Scheduled EDR Contact: 09/10/2018
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 03/19/2018

Date Data Arrived at EDR: 03/27/2018

Date Made Active in Reports: 06/08/2018

Number of Days to Update: 73

Source: National Response Center, United States Coast Guard

Telephone: 202-267-2180

Last EDR Contact: 06/27/2018

Next Scheduled EDR Contact: 10/08/2018

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: 04/30/2018

Date Data Arrived at EDR: 05/02/2018

Date Made Active in Reports: 06/22/2018

Number of Days to Update: 51

Source: Department of Toxic Substances Control

Telephone: 916-323-3400

Last EDR Contact: 05/02/2018

Next Scheduled EDR Contact: 08/13/2018

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 identifies 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: 04/30/2018

Date Data Arrived at EDR: 05/02/2018

Date Made Active in Reports: 06/22/2018

Number of Days to Update: 51

Source: Department of Toxic Substances Control

Telephone: 916-323-3400

Last EDR Contact: 05/02/2018

Next Scheduled EDR Contact: 08/13/2018

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 inventory of solid waste disposal facilities or landfills. These may be active or inactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/14/2018

Date Data Arrived at EDR: 05/16/2018

Date Made Active in Reports: 06/22/2018

Number of Days to Update: 37

Source: Department of Resources Recycling and Recovery

Telephone: 916-341-6320

Last EDR Contact: 05/16/2018

Next Scheduled EDR Contact: 08/27/2018

Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 06/11/2018

Date Data Arrived at EDR: 06/13/2018

Date Made Active in Reports: 07/17/2018

Number of Days to Update: 34

Source: State Water Resources Control Board

Telephone: see region list

Last EDR Contact: 06/13/2018

Next Scheduled EDR Contact: 09/24/2018

Data Release Frequency: Quarterly

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 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005

Date Data Arrived at EDR: 02/15/2005

Date Made Active in Reports: 03/28/2005

Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)

Telephone: 909-782-4496

Last EDR Contact: 08/15/2011

Next Scheduled EDR Contact: 11/28/2011

Data Release Frequency: Varies

LUST REG 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 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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 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: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

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: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 08/06/2018
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: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/24/2018	Source: EPA Region 7
Date Data Arrived at EDR: 05/18/2018	Telephone: 913-551-7003
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 04/01/2018	Source: EPA Region 6
Date Data Arrived at EDR: 05/18/2018	Telephone: 214-665-6597
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 05/08/2018	Source: EPA Region 4
Date Data Arrived at EDR: 05/18/2018	Telephone: 404-562-8677
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/16/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 04/13/2018	Source: EPA Region 1
Date Data Arrived at EDR: 05/18/2018	Telephone: 617-918-1313
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 04/12/2018	Source: EPA, Region 5
Date Data Arrived at EDR: 05/18/2018	Telephone: 312-886-7439
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 04/12/2018	Source: EPA Region 10
Date Data Arrived at EDR: 05/18/2018	Telephone: 206-553-2857
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 06/11/2018	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/13/2018	Telephone: 866-480-1028
Date Made Active in Reports: 07/17/2018	Last EDR Contact: 12/12/2018
Number of Days to Update: 34	Next Scheduled EDR Contact: 09/24/2018
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 6L: SLIC Sites

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 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: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/11/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/10/2018
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Varies

UST: Active UST Facilities

Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/11/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/09/2018
Number of Days to Update: 26

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Semi-Annually

MILITARY UST SITES: Military UST Sites (GEOTRACKER)

Military ust sites

Date of Government Version: 06/11/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 09/24/2018
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: 06/21/2018
Next Scheduled EDR Contact: 10/01/2018
Data Release Frequency: Quarterly

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: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 08/06/2018
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: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 08/06/2018
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: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 04/24/2018	Source: EPA Region 7
Date Data Arrived at EDR: 05/18/2018	Telephone: 913-551-7003
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 04/01/2018	Source: EPA Region 6
Date Data Arrived at EDR: 05/18/2018	Telephone: 214-665-7591
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 04/13/2018	Source: EPA, Region 1
Date Data Arrived at EDR: 05/18/2018	Telephone: 617-918-1313
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 05/08/2018	Source: EPA Region 4
Date Data Arrived at EDR: 05/18/2018	Telephone: 404-562-9424
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/16/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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: 04/12/2018	Source: EPA Region 5
Date Data Arrived at EDR: 05/18/2018	Telephone: 312-886-6136
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/18/2018
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/06/2018
	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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/30/2018
Date Data Arrived at EDR: 05/02/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 51

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/02/2018
Next Scheduled EDR Contact: 08/13/2018
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: 06/22/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Listing

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 Brownfields 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: 03/26/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 38

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 06/27/2018
Next Scheduled EDR Contact: 10/08/2018
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: 03/19/2018
Date Data Arrived at EDR: 03/21/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/20/2018
Next Scheduled EDR Contact: 10/01/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 07/24/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 51

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 05/29/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 48

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/22/2018
Next Scheduled EDR Contact: 08/27/2018
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: 01/30/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

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

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: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
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 Services, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 05/04/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 02/22/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 05/11/2018
Number of Days to Update: 71

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
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: 04/30/2018
Date Data Arrived at EDR: 05/02/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 51

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/02/2018
Next Scheduled EDR Contact: 08/13/2018
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: 06/30/2017
Date Data Arrived at EDR: 08/18/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 34

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 07/05/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 05/11/2018
Number of Days to Update: 71

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Quarterly

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: 04/23/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 44

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 07/25/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 03/28/2018
Date Data Arrived at EDR: 05/25/2018
Date Made Active in Reports: 07/10/2018
Number of Days to Update: 46

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 05/22/2018
Next Scheduled EDR Contact: 09/10/2018
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: 04/19/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 10

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 05/02/2018
Next Scheduled EDR Contact: 08/20/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 04/23/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 44

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 07/25/2018
Next Scheduled EDR Contact: 11/05/2018
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: 05/31/2018
Date Data Arrived at EDR: 06/05/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 43

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/17/2018
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: 05/13/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 30

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 08/06/2018
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: 06/04/2018
Date Data Arrived at EDR: 06/06/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 41

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/26/2018	Source: U.S. Department of Transportation
Date Data Arrived at EDR: 03/27/2018	Telephone: 202-366-4555
Date Made Active in Reports: 06/08/2018	Last EDR Contact: 03/27/2018
Number of Days to Update: 73	Next Scheduled EDR Contact: 07/09/2018
	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: 04/06/2018	Source: Office of Emergency Services
Date Data Arrived at EDR: 04/24/2018	Telephone: 916-845-8400
Date Made Active in Reports: 06/14/2018	Last EDR Contact: 04/24/2018
Number of Days to Update: 51	Next Scheduled EDR Contact: 08/06/2018
	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: 06/11/2018	Source: State Water Quality Control Board
Date Data Arrived at EDR: 06/13/2018	Telephone: 866-480-1028
Date Made Active in Reports: 07/17/2018	Last EDR Contact: 12/12/2018
Number of Days to Update: 34	Next Scheduled EDR Contact: 09/24/2018
	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: 06/11/2018	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/13/2018	Telephone: 866-480-1028
Date Made Active in Reports: 07/17/2018	Last EDR Contact: 12/12/2018
Number of Days to Update: 34	Next Scheduled EDR Contact: 09/24/2018
	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	Source: FirstSearch
Date Data Arrived at EDR: 01/03/2013	Telephone: N/A
Date Made Active in Reports: 02/22/2013	Last EDR Contact: 01/03/2013
Number of Days to Update: 50	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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/28/2018
Next Scheduled EDR Contact: 10/08/2018
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: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/25/2018
Next Scheduled EDR Contact: 09/03/2018
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: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
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: 07/13/2018
Next Scheduled EDR Contact: 10/22/2018
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: 05/15/2018
Next Scheduled EDR Contact: 08/27/2018
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: 03/01/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 87

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 06/27/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/21/2014	Telephone: 617-520-3000
Date Made Active in Reports: 06/17/2014	Last EDR Contact: 05/07/2018
Number of Days to Update: 88	Next Scheduled EDR Contact: 08/20/2018
	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	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/08/2018	Telephone: 703-308-4044
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 05/08/2018
Number of Days to Update: 73	Next Scheduled EDR Contact: 08/20/2018
	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	Source: EPA
Date Data Arrived at EDR: 06/21/2017	Telephone: 202-260-5521
Date Made Active in Reports: 01/05/2018	Last EDR Contact: 06/22/2018
Number of Days to Update: 198	Next Scheduled EDR Contact: 10/01/2018
	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	Source: EPA
Date Data Arrived at EDR: 01/10/2018	Telephone: 202-566-0250
Date Made Active in Reports: 01/12/2018	Last EDR Contact: 05/25/2018
Number of Days to Update: 2	Next Scheduled EDR Contact: 09/03/2018
	Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 12/10/2010	Telephone: 202-564-4203
Date Made Active in Reports: 02/25/2011	Last EDR Contact: 04/09/2018
Number of Days to Update: 77	Next Scheduled EDR Contact: 08/06/2018
	Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 05/13/2018	Source: EPA
Date Data Arrived at EDR: 05/30/2018	Telephone: 703-416-0223
Date Made Active in Reports: 06/29/2018	Last EDR Contact: 07/06/2018
Number of Days to Update: 30	Next Scheduled EDR Contact: 10/15/2018
	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: 11/02/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/17/2017	Telephone: 202-564-8600
Date Made Active in Reports: 12/08/2017	Last EDR Contact: 07/20/2018
Number of Days to Update: 21	Next Scheduled EDR Contact: 11/05/2018
	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	Source: EPA
Date Data Arrived at EDR: 07/03/1995	Telephone: 202-564-4104
Date Made Active in Reports: 08/07/1995	Last EDR Contact: 06/02/2008
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/01/2008
	Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 10/17/2014	Telephone: 202-564-6023
Date Made Active in Reports: 10/20/2014	Last EDR Contact: 07/06/2018
Number of Days to Update: 3	Next Scheduled EDR Contact: 08/20/2018
	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: 06/01/2017	Source: EPA
Date Data Arrived at EDR: 06/09/2017	Telephone: 202-566-0500
Date Made Active in Reports: 10/13/2017	Last EDR Contact: 07/13/2018
Number of Days to Update: 126	Next Scheduled EDR Contact: 10/22/2018
	Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/23/2016	Telephone: 202-564-2501
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 07/09/2018
Number of Days to Update: 79	Next Scheduled EDR Contact: 10/22/2018
	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	Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 08/18/2017
Number of Days to Update: 25	Next Scheduled EDR Contact: 12/04/2017
	Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009	Source: EPA
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 08/18/2017
Number of Days to Update: 25	Next Scheduled EDR Contact: 12/04/2017
	Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016	Source: Nuclear Regulatory Commission
Date Data Arrived at EDR: 09/08/2016	Telephone: 301-415-7169
Date Made Active in Reports: 10/21/2016	Last EDR Contact: 07/23/2018
Number of Days to Update: 43	Next Scheduled EDR Contact: 11/05/2018
	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	Source: Department of Energy
Date Data Arrived at EDR: 08/07/2009	Telephone: 202-586-8719
Date Made Active in Reports: 10/22/2009	Last EDR Contact: 06/07/2018
Number of Days to Update: 76	Next Scheduled EDR Contact: 09/17/2018
	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	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/10/2014	Telephone: N/A
Date Made Active in Reports: 10/20/2014	Last EDR Contact: 06/04/2018
Number of Days to Update: 40	Next Scheduled EDR Contact: 09/17/2018
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/30/2017	Telephone: 202-566-0517
Date Made Active in Reports: 12/15/2017	Last EDR Contact: 04/27/2018
Number of Days to Update: 15	Next Scheduled EDR Contact: 08/06/2018
	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: 04/03/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 04/05/2018	Telephone: 202-343-9775
Date Made Active in Reports: 06/29/2018	Last EDR Contact: 07/05/2018
Number of Days to Update: 85	Next Scheduled EDR Contact: 10/15/2018
	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	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2007
Number of Days to Update: 40	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	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2008
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012	Source: Department of Transportation, Office of Pipeline Safety
Date Data Arrived at EDR: 08/07/2012	Telephone: 202-366-4595
Date Made Active in Reports: 09/18/2012	Last EDR Contact: 05/03/2018
Number of Days to Update: 42	Next Scheduled EDR Contact: 08/13/2018
	Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/31/2018
Date Data Arrived at EDR: 04/16/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 74

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/09/2018
Next Scheduled EDR Contact: 10/01/2018
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: 06/28/2018
Next Scheduled EDR Contact: 09/03/2018
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: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
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: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 05/07/2018
Next Scheduled EDR Contact: 08/20/2018
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: 05/18/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 05/13/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 30

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 10/15/2018
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 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

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: 05/03/2018
Date Data Arrived at EDR: 05/31/2018
Date Made Active in Reports: 06/29/2018
Number of Days to Update: 29

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/10/2018
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: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
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: 05/30/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 03/08/2018	Source: Department of Interior
Date Data Arrived at EDR: 03/13/2018	Telephone: 202-208-2609
Date Made Active in Reports: 06/08/2018	Last EDR Contact: 06/20/2018
Number of Days to Update: 87	Next Scheduled EDR Contact: 09/24/2018
	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: 02/21/2018	Source: EPA
Date Data Arrived at EDR: 02/23/2018	Telephone: (415) 947-8000
Date Made Active in Reports: 03/23/2018	Last EDR Contact: 06/06/2018
Number of Days to Update: 28	Next Scheduled EDR Contact: 09/17/2018
	Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 02/25/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/17/2018	Telephone: 202-564-2280
Date Made Active in Reports: 06/08/2018	Last EDR Contact: 06/06/2018
Number of Days to Update: 83	Next Scheduled EDR Contact: 09/17/2018
	Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 01/04/2018	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/19/2018	Telephone: 202-564-0527
Date Made Active in Reports: 04/13/2018	Last EDR Contact: 06/01/2018
Number of Days to Update: 84	Next Scheduled EDR Contact: 09/10/2018
	Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2016	Source: Department of Defense
Date Data Arrived at EDR: 10/31/2017	Telephone: 703-704-1564
Date Made Active in Reports: 01/12/2018	Last EDR Contact: 07/13/2018
Number of Days to Update: 73	Next Scheduled EDR Contact: 10/29/2018
	Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 30

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/23/2018
Next Scheduled EDR Contact: 09/03/2018
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: 03/26/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 38

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 06/27/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

CUPA SAN FRANCISCO CO: CUPA SAN FRANCISCO CO

Cupa facilities

Date of Government Version: 04/20/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 10

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 05/02/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Varies

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 04/03/2018
Date Data Arrived at EDR: 05/07/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 39

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 05/07/2018
Next Scheduled EDR Contact: 08/27/2018
Data Release Frequency: Varies

DRYCLEAN AVAQMD: DRYCLEAN AVAQMD

A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 03/13/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 52

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 06/22/2018
Next Scheduled EDR Contact: 09/17/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/27/2018
Date Data Arrived at EDR: 03/29/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 36

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 05/30/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Annually

DRYCLEAN SOUTH COAST: DRYCLEAN SOUTH COAST

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 03/16/2018
Date Data Arrived at EDR: 03/20/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 45

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 06/11/2018
Next Scheduled EDR Contact: 09/10/2018
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: 12/31/2015
Date Data Arrived at EDR: 03/21/2017
Date Made Active in Reports: 08/15/2017
Number of Days to Update: 147

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/20/2018
Next Scheduled EDR Contact: 10/01/2018
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: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 07/06/2018
Number of Days to Update: 73

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/20/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 60

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
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: 05/14/2018
Date Data Arrived at EDR: 05/15/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 38

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 05/09/2018
Next Scheduled EDR Contact: 08/27/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 97

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/13/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 05/21/2018
Date Data Arrived at EDR: 05/23/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 55

Source: Department of Toxic Substances Control
Telephone: 877-786-9427
Last EDR Contact: 05/23/2018
Next Scheduled EDR Contact: 09/03/2018
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: 05/21/2018
Date Data Arrived at EDR: 05/23/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 55

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/23/2018
Next Scheduled EDR Contact: 09/03/2018
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: 04/09/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
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: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 51

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 09/24/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 05/23/2018
Date Data Arrived at EDR: 06/06/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 42

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 05/14/2018
Date Data Arrived at EDR: 05/16/2018
Date Made Active in Reports: 07/05/2018
Number of Days to Update: 50

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/16/2018
Next Scheduled EDR Contact: 08/27/2018
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: 06/04/2018
Date Data Arrived at EDR: 06/06/2018
Date Made Active in Reports: 07/19/2018
Number of Days to Update: 43

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 51

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 09/24/2018
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: 03/23/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 38

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/14/2018
Next Scheduled EDR Contact: 10/01/2018
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: Department of Conservation
Telephone: 916-445-2408
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 09/24/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/10/2018
Date Data Arrived at EDR: 04/13/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 67

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/11/2018
Next Scheduled EDR Contact: 10/22/2018
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: 05/16/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 06/25/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)

Produced water ponds sites

Date of Government Version: 06/11/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)

Projects sites

Date of Government Version: 06/11/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 06/11/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 09/24/2018
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: 06/11/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 06/04/2018	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/06/2018	Telephone: 866-794-4977
Date Made Active in Reports: 07/13/2018	Last EDR Contact: 06/06/2018
Number of Days to Update: 37	Next Scheduled EDR Contact: 09/17/2018
	Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 06/11/2018	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/13/2018	Telephone: 866-480-1028
Date Made Active in Reports: 07/18/2018	Last EDR Contact: 12/12/2018
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/24/2018
	Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)

Sampling point - public sites

Date of Government Version: 06/11/2018	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/13/2018	Telephone: 866-480-1028
Date Made Active in Reports: 07/18/2018	Last EDR Contact: 12/12/2018
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/24/2018
	Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)

Underground control injection sites

Date of Government Version: 06/11/2018	Source: State Water Resource Control Board
Date Data Arrived at EDR: 06/13/2018	Telephone: 866-480-1028
Date Made Active in Reports: 07/18/2018	Last EDR Contact: 12/12/2018
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/24/2018
	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: 04/23/2018	Source: California Environmental Protection Agency
Date Data Arrived at EDR: 04/24/2018	Telephone: 916-323-2514
Date Made Active in Reports: 06/07/2018	Last EDR Contact: 07/25/2018
Number of Days to Update: 44	Next Scheduled EDR Contact: 11/05/2018
	Data Release Frequency: Varies

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)

Military privatized sites

Date of Government Version: 06/11/2018	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/13/2018	Telephone: 866-480-1028
Date Made Active in Reports: 07/18/2018	Last EDR Contact: 12/12/2018
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/24/2018
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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:

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: 04/05/2018
Date Data Arrived at EDR: 04/10/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 65

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/05/2018
Date Data Arrived at EDR: 04/10/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 24

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/05/2018
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 03/31/2018
Date Data Arrived at EDR: 04/05/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 70

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 06/14/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 07/05/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing Cupa Facility Listing

Date of Government Version: 05/07/2018
Date Data Arrived at EDR: 05/09/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 36

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 06/25/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List Cupa facility list.

Date of Government Version: 05/23/2018
Date Data Arrived at EDR: 05/24/2018
Date Made Active in Reports: 07/13/2018
Number of Days to Update: 50

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 05/16/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/21/2018
Date Data Arrived at EDR: 05/25/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 56

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 04/30/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List Cupa Facility list

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 05/02/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 44

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/24/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List CUPA facility list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/05/2018
Date Data Arrived at EDR: 03/08/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 39

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/05/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 9

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 07/11/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Semi-Annually

GLENN COUNTY:

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: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 03/05/2018
Date Data Arrived at EDR: 03/08/2018
Date Made Active in Reports: 04/30/2018
Number of Days to Update: 53

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 05/21/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

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: 06/14/2018
Number of Days to Update: 50

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INYO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 05/30/2018

Next Scheduled EDR Contact: 09/03/2018

Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 05/02/2018

Date Data Arrived at EDR: 05/07/2018

Date Made Active in Reports: 07/18/2018

Number of Days to Update: 72

Source: Kern County Environment Health Services Department

Telephone: 661-862-8700

Last EDR Contact: 07/20/2018

Next Scheduled EDR Contact: 08/20/2018

Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 06/12/2018

Date Data Arrived at EDR: 06/15/2018

Date Made Active in Reports: 07/13/2018

Number of Days to Update: 28

Source: Kings County Department of Public Health

Telephone: 559-584-1411

Last EDR Contact: 05/16/2018

Next Scheduled EDR Contact: 09/03/2018

Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 05/09/2018

Date Data Arrived at EDR: 05/11/2018

Date Made Active in Reports: 06/14/2018

Number of Days to Update: 34

Source: Lake County Environmental Health

Telephone: 707-263-1164

Last EDR Contact: 07/16/2018

Next Scheduled EDR Contact: 10/29/2018

Data Release Frequency: Varies

LASSEN COUNTY:

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: Lassen County Environmental Health

Telephone: 530-251-8528

Last EDR Contact: 07/17/2018

Next Scheduled EDR Contact: 11/05/2018

Data Release Frequency: Varies

LOS ANGELES COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 10/01/2018
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 04/16/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 60

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 07/05/2018
Next Scheduled EDR Contact: 10/22/2018
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/16/2018
Date Data Arrived at EDR: 04/17/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 63

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/18/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2018
Date Data Arrived at EDR: 05/01/2018
Date Made Active in Reports: 05/14/2018
Number of Days to Update: 13

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/11/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 04/17/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 63

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/20/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Annually

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: 07/11/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/04/2018

Date Data Arrived at EDR: 01/05/2018

Date Made Active in Reports: 01/18/2018

Number of Days to Update: 13

Source: City of Torrance Fire Department

Telephone: 310-618-2973

Last EDR Contact: 07/23/2018

Next Scheduled EDR Contact: 10/22/2018

Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 02/21/2018

Date Data Arrived at EDR: 02/22/2018

Date Made Active in Reports: 04/03/2018

Number of Days to Update: 40

Source: Madera County Environmental Health

Telephone: 559-675-7823

Last EDR Contact: 05/16/2018

Next Scheduled EDR Contact: 09/03/2018

Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 03/30/2018

Date Data Arrived at EDR: 04/06/2018

Date Made Active in Reports: 05/04/2018

Number of Days to Update: 28

Source: Public Works Department Waste Management

Telephone: 415-473-6647

Last EDR Contact: 07/11/2018

Next Scheduled EDR Contact: 10/15/2018

Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 05/30/2018

Date Data Arrived at EDR: 06/01/2018

Date Made Active in Reports: 07/13/2018

Number of Days to Update: 42

Source: Merced County Environmental Health

Telephone: 209-381-1094

Last EDR Contact: 05/16/2018

Next Scheduled EDR Contact: 09/03/2018

Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List

CUPA Facility List

Date of Government Version: 05/22/2018

Date Data Arrived at EDR: 05/24/2018

Date Made Active in Reports: 07/13/2018

Number of Days to Update: 50

Source: Mono County Health Department

Telephone: 760-932-5580

Last EDR Contact: 05/22/2018

Next Scheduled EDR Contact: 09/10/2018

Data Release Frequency: Varies

MONTEREY COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing

CUPA Program listing from the Environmental Health Division.

Date of Government Version: 06/13/2018
Date Data Arrived at EDR: 06/19/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 31

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 07/02/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination

A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 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: 05/22/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites

Underground storage tank sites located in Napa county.

Date of Government Version: 05/23/2018
Date Data Arrived at EDR: 05/31/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 41

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/22/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 04/24/2018
Date Data Arrived at EDR: 05/01/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 45

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/24/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups

Petroleum and non-petroleum spills.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 05/11/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 42

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/07/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups

Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 05/11/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 45

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/07/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities

Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 04/02/2018

Date Data Arrived at EDR: 05/08/2018

Date Made Active in Reports: 07/10/2018

Number of Days to Update: 63

Source: Health Care Agency

Telephone: 714-834-3446

Last EDR Contact: 05/08/2018

Next Scheduled EDR Contact: 08/20/2018

Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities

List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 05/31/2018

Date Data Arrived at EDR: 06/05/2018

Date Made Active in Reports: 07/18/2018

Number of Days to Update: 43

Source: Placer County Health and Human Services

Telephone: 530-745-2363

Last EDR Contact: 05/31/2018

Next Scheduled EDR Contact: 09/17/2018

Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List

Plumas County CUPA Program facilities.

Date of Government Version: 01/22/2018

Date Data Arrived at EDR: 01/24/2018

Date Made Active in Reports: 03/15/2018

Number of Days to Update: 50

Source: Plumas County Environmental Health

Telephone: 530-283-6355

Last EDR Contact: 07/17/2018

Next Scheduled EDR Contact: 11/05/2018

Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/05/2018

Date Data Arrived at EDR: 04/10/2018

Date Made Active in Reports: 05/04/2018

Number of Days to Update: 24

Source: Department of Environmental Health

Telephone: 951-358-5055

Last EDR Contact: 06/18/2018

Next Scheduled EDR Contact: 10/01/2018

Data Release Frequency: Quarterly

Underground Storage Tank Tank List

Underground storage tank sites located in Riverside county.

Date of Government Version: 04/05/2018

Date Data Arrived at EDR: 04/10/2018

Date Made Active in Reports: 05/04/2018

Number of Days to Update: 24

Source: Department of Environmental Health

Telephone: 951-358-5055

Last EDR Contact: 06/18/2018

Next Scheduled EDR Contact: 10/01/2018

Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List

List of sites where unauthorized releases of potentially hazardous materials have occurred.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/02/2018
Date Data Arrived at EDR: 04/04/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 71

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/03/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/02/2018
Date Data Arrived at EDR: 04/04/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 76

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/03/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 05/16/2018
Date Data Arrived at EDR: 05/22/2018
Date Made Active in Reports: 07/13/2018
Number of Days to Update: 52

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 05/16/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 04/09/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 69

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 06/04/2018
Date Data Arrived at EDR: 06/06/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 41

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

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: 04/18/2018
Date Data Arrived at EDR: 04/23/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 11

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversight 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: 05/02/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 06/07/2018
Date Data Arrived at EDR: 06/12/2018
Date Made Active in Reports: 07/10/2018
Number of Days to Update: 28

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 05/02/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST

A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 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: 06/14/2018
Next Scheduled EDR Contact: 10/01/2018
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List

Cupa Facility List.

Date of Government Version: 05/16/2018
Date Data Arrived at EDR: 05/22/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 56

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 05/16/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory

List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 03/14/2018
Date Data Arrived at EDR: 03/20/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 45

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Annually

Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/15/2018
Date Data Arrived at EDR: 03/20/2018
Date Made Active in Reports: 05/04/2018
Number of Days to Update: 45

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/06/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing

CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 05/16/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List

Cupa facility list

Date of Government Version: 05/16/2018
Date Data Arrived at EDR: 05/23/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 55

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 05/16/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 05/22/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 05/16/2018
Date Data Arrived at EDR: 05/22/2018
Date Made Active in Reports: 07/19/2018
Number of Days to Update: 58

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 05/16/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

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: 05/16/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

SHASTA COUNTY:

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: 05/16/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2018
Date Data Arrived at EDR: 06/08/2018
Date Made Active in Reports: 07/18/2018
Number of Days to Update: 40

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Quarterly

Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2018
Date Data Arrived at EDR: 06/12/2018
Date Made Active in Reports: 07/12/2018
Number of Days to Update: 30

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Quarterly

SONOMA COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Cupa Facility List

Cupa Facility list

Date of Government Version: 06/19/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 21

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 06/21/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 04/03/2018
Date Data Arrived at EDR: 04/06/2018
Date Made Active in Reports: 05/09/2018
Number of Days to Update: 33

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 06/21/2018
Next Scheduled EDR Contact: 10/08/2018
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 05/11/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 35

Source: Stanislaus County Department of Environmental Protection
Telephone: 209-525-6751
Last EDR Contact: 07/16/2018
Next Scheduled EDR Contact: 10/29/2018
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 06/04/2018
Date Data Arrived at EDR: 06/08/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 33

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/17/2018
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List

Cupa facilities

Date of Government Version: 01/26/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 47

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 05/03/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List

Cupa facility list

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 51

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

TULARE COUNTY:

CUPA Facility List

Cupa program facilities

Date of Government Version: 03/19/2018
Date Data Arrived at EDR: 03/22/2018
Date Made Active in Reports: 04/17/2018
Number of Days to Update: 26

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 07/16/2018
Next Scheduled EDR Contact: 08/20/2018
Data Release Frequency: Varies

TUOLUMNE COUNTY:

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: Division of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/17/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 03/26/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 58

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/23/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/27/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/09/2018
Next Scheduled EDR Contact: 08/27/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 03/26/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/23/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 04/26/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 28

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/13/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 06/20/2018
Date Data Arrived at EDR: 07/03/2018
Date Made Active in Reports: 07/12/2018
Number of Days to Update: 9

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 06/27/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 05/10/2018
Date Data Arrived at EDR: 05/15/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 31

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/24/2018
Next Scheduled EDR Contact: 11/12/2018
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: 01/03/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 03/22/2018
Number of Days to Update: 36

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/18/2018
Next Scheduled EDR Contact: 08/27/2018
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 107

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/13/2018
Next Scheduled EDR Contact: 10/22/2018
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: 04/30/2018
Date Data Arrived at EDR: 05/03/2018
Date Made Active in Reports: 06/07/2018
Number of Days to Update: 35

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/03/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/25/2017
Date Made Active in Reports: 09/25/2017
Number of Days to Update: 62

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/12/2018
Next Scheduled EDR Contact: 10/29/2018
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: 05/21/2018
Next Scheduled EDR Contact: 09/03/2018
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/15/2018
Date Made Active in Reports: 07/09/2018
Number of Days to Update: 24

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/11/2018
Next Scheduled EDR Contact: 09/24/2018
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data

Source: PennWell Corporation

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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 & Game

Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map

Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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Appendix E
Regulatory Agency Correspondence



Department of Toxic Substances Control

Matthew Rodriguez
Secretary for
Environmental Protection

Barbara A. Lee, Director
9211 Oakdale Avenue
Chatsworth, California 91311

Edmund G. Brown Jr.
Governor

April 20, 2017

Mr. Michael A. Shull
Superintendent
Planning and Construction
City of Los Angeles Department of Recreation and Parks
221 North Figueroa Street, Suite 100
Los Angeles, California 90012

APPROVAL OF REMEDIAL ACTION COMPLETION REPORT - CHATSWORTH PARK
SOUTH, 22360 DEVONSHIRE STREET, CHATSWORTH, CALIFORNIA
SITE CODE: 301384-11

Dear Mr. Shull:

The Department of Toxic Substances Control (DTSC) has reviewed the Remedial Action Completion Report (Report) dated December 20, 2016 prepared by URS on behalf of the City of Los Angeles, Department of Recreation and Parks for the above referenced site (Site). The Report documents the removal and off-site disposal of soils contaminated with lead, metal, and polycyclic aromatic hydrocarbons (PAH) in accordance with an approved Remedial Action Workplan (RAP) (URS Corporation, March 2013) for the Site. The Report was prepared pursuant to Voluntary Cleanup Agreement (VCA), Docket No. HSA-VCA 08/09-021.

The 72 acre Site, identified by Los Angeles County Office of the Assessor parcel number 2723-010-904 had a small arms firing range (SAFR) on a portion of the Site from the early to the mid-1960s. The operation of the SAFR resulted in wide surficial spreading of lead shot and clay pigeon debris containing elevated polycyclic aromatic hydrocarbons (PAHs). The City of Los Angeles acquired the property in 1973 and developed approximately 21 acres of the Site with recreational facilities during the 1970s and 1980s. Historical investigations indicated that significant amounts of lead pellets and clay pigeon debris were present on the surface of many areas of the Site. Metals (lead, arsenic, antimony); PAHs (benzo(a)pyrene-equivalent, naphthalene), and dioxins/furans were identified as the primary contaminants of concern (COC) in the soil depth interval of 0 to 4 feet below ground surface (bgs) and were the targets for remediation at the Site.

The approved RAP proposed remediation of COCs in soil which included installation of an engineered surface cap, and some soil excavation with off-site disposal. To achieve the Remedial Action Objectives, various alternatives were evaluated in the RAP and the preferred remedial action alternative selected was Surface Capping to mitigate and/or remediate impacted shallow soil for non-volatile COC concentrations above risk-based cleanup levels established in the Human Health Risk Assessment document. In the rocky outcrop area (Area E), with extensive accumulation of visible lead pellets on the rock surface and shallow soil, pellets were

Mr. Michael A. Shull

April 20, 2017

Page 2

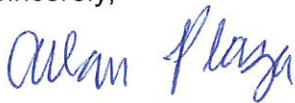
removed manually by vacuums, rakes, and shovels. Approximately 496 tons RCRA hazardous waste and 5,773 tons of grubbed material and excess excavated soil were lawfully transported offsite for disposal as non-hazardous and non-RCRA hazardous waste. In total, approximately 915,000 square feet of engineered surface cap were installed. In addition to approximately 4 acres of tree groves, the surface cap was vegetated and/or covered with 6,590 shrubs, native grass hydro-seed, and mulch to provide long-term erosion protection for the engineered cap.

As impacted soil remains beneath the site's engineered surface cap, from approximately 1 to 4 feet bgs, a land use covenant (LUC) is reasonably necessary to protect present or future human health or safety or the environment as a result of the presence of hazardous materials on the Site as defined in Health and Safety Code section 25260. The LUC will incorporate an Operation and Maintenance Plan (OMP) and Soil Management Plan (SMP) that will outline the requirements for future site work in order to maintain the constructed remedial components (i.e., engineered cap, fencing, etc.) and the requirements for future invasive site work that could expose workers to the residual COCs on the Site.

Based on the information provided, DTSC agrees with the Report's recommendations for land restriction and institutional controls through a long term Operations and Monitoring (O&M) Plan. DTSC hereby approves the Report.

If you have any questions, please contact Chand Sultana, Ph. D, Project Manager, at (818) 717-6552 or me, at (818) 717-6609.

Sincerely,



Allan Plaza

Unit Chief

Brownfields and Environmental Restoration Program – Chatsworth Office

cc: Mr. Paul Davis
Environmental Specialist, DRP/P&C
221 North Figueroa Street, Suite 100
Los Angeles, California 90012

Mr. Brian J. Jacobs, P.G., C.HG.
Program Manager
URS Corporation
915 Wilshire Boulevard, Suite 700
Los Angeles, California 90017

Nicole Bernson
Deputy Chief of Staff
Councilmember Mitchell Englander
200 North Spring Streets, Suite 405
Los Angeles, California 90012

Appendix F
Crimson Pipeline L.P. Information Regarding Pipeline At/Near Site

CRIMSON PIPELINE L.P.
3760 Kilroy Airport Way, Suite 300
Long Beach, CA 90806

August 22, 2018

Colin Young,
C. Young Forensics
1042 Skylark Dr.
La Jolla CA
92037

Re: C08202018E - Notice of Improvement Response Letter
FIRST UTILITY NOTICE FACILITY RESEARCH AND REQUEST FOR COMMENTS FOR C. YOUNG
FORENSICS
22360 WEST DEVONSHIRE STREET, LOS ANGELES

Dear Colin Young,

Pursuant to your request dated August 16, 2018, pertaining to the above referenced project, please be advised that Crimson Pipeline Department maintains pipelines within the vicinity of your proposed project. We are prepared to mark our facilities upon receiving 48-hour advanced Underground Service Alert (USA) notice.

Enclosed for your information are drawings that depict the general alignment of our pipelines. Upon completion of your final project drawings, please provide us a detailed set of your plans for our review to determine if there is a conflict with any of our existing facilities.

Crimson requires a representative to be on site during any construction activities within the vicinity of our facilities. Therefore, you or your contractors are hereby notified to contact, in addition to the above referenced USA notice, Crimson's designated representative, Tim Eggleston cell: 805-791-0028, between the hours of 6:30 A.M. and 5:00 P.M., Monday through Friday, a minimum of 48 hours in advance of commencing said construction activities.

Please be advised that any and all facilities identified as "Active", "Idle", or "Abandoned", unless otherwise clearly specified, remain the property of Crimson, and that all activities affecting these facilities must be approved and controlled by Crimson. Should it be determined that said facility potentially interferes with your project this office must be notified immediately, at which time Crimson personnel will review the issues to determine what actions will be necessary to identify and resolve any conflicts.

If you have questions or require additional information regarding this submittal, please contact Nick Lisica at 562-285-4187.

Sincerely,



Nick Lisica
Utilities Coordinator

CRIMSON PIPELINE L.P.

3760 Kilroy Airport Way, Suite 300
Long Beach, CA 90806

Construction Requirements in the Proximity of Crimson Pipelines

Crimson Pipeline L.P. (Crimson) is committed to the continued, safe operation of its pipeline. The listed construction requirements are designed to help ensure that the pipeline is protected from excavation damage, encroachment or other risks that could adversely impact the pipeline or prevent required inspection and maintenance activities.

1. Crimson requires two copies of any proposed plans for work within Crimson's right-of-way. Plans shall be provided 45 calendar days prior to commencement of work to the address listed above.
2. Above ground structures and improvements that interfere with the construction, maintenance or repair of the pipeline are prohibited within Crimson's right-of-way. Structures and improvements include, but are not limited to, buildings, fences and walls.
3. Landscaped areas are permitted within the right-of-way. Trees and large bushes that impede the visual inspection of the ground surface are not permitted within the right-of-way. Crimson shall review all plans that encroach the pipeline and the pipeline right of way prior to 4.
4. Federal law prohibits removing, damaging or defacing of pipelines, pipeline signs, or other appurtenances installed on the pipelines right of way.
5. Other utilities may be installed within the right-of-way with permission from Crimson. Such utilities must maintain a minimum of 5 feet parallel and 1-foot vertical clearances unless approved in writing by Crimson prior to their installation. All clearances must conform to existing state and federal regulations.
6. A minimum of 3 feet, but not more than 6 feet of cover must be maintained over the pipeline at all times, unless otherwise approved by Crimson Pipeline in writing. The ground contour cannot be changed within the right-of-way without prior written permission by Crimson.
7. Proposed roads and utility crossings should cross Crimson's right-of-way as close to 90 degrees as possible. If, in Crimson's sole judgment, additional precautions are required to protect Crimson's pipeline, Crimson shall review and approve the construction plans in writing prior to the start of construction.
8. California State Law requires that parties notify Underground Service Alert at 1-800-227-2600, two full working days prior to digging.
9. All work on/or around the Crimson facility must comply with appropriate sections of Code of Federal Regulations Title 49, Part 195 - **TRANSPORTATION OF HAZARDOUS LIQUIDS BY PIPELINE.**
10. Crimson may choose to have an inspector on-site during any grading or excavation activities near the Crimson pipeline. Arrangements may be made for on-site inspection by contacting Crimson Utilities Coordinator at the address shown above.
11. Crimson requires that all excavation in the vicinity of the pipeline be done with hand tools in the presence of the Crimson's inspector consistent with California State Law requirements. Any damage to the pipeline shall be reported immediately. Crimson shall perform the necessary repair to insure the safety of the public safety. Crimson shall be reimbursed for all repair work necessary to continue with the safe, reliable operation of the pipeline.
12. In an emergency, including any damage or suspected damage to the Crimson pipeline, immediately notify Crimson at: 1-866-351-7473.
13. Any questions regarding construction activities in the vicinity of Crimson's pipeline shall be directed to:

UTILITIES COORDINATOR

Ph: (562) 285-4112 or (833) 876-4589

Fx: (562) 285-4141

Email: landdepartment@crimsonpl.com

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940

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2783+00

2780+50

2778+00

2775+50

2773+00

2770+50

2768+00

2765+50

CAUTION

LOCATION OF PIPE LINES AS SHOWN MAY NOT BE EXACT. THE SPECIFIC LOCATIONS AND DEPTHS OF SUCH LINES MUST BE DETERMINED BY HAND EXCAVATION. BEFORE ANY EXCAVATION OR OTHER WORK NEAR THE LINES SHOWN ON THIS MAP, CONTACT CRIMSON PIPELINE, AT (866) 351-7473 24HRS. 7 DAYS A WEEK

NOTE: On Lassen St, Farralone Ave. & Devonshire St 4" Gasoline Line is laid under City of Los Angeles Franchise granted under Ord. No. 85029 and by Board of Public Works Permit Nos. 6105-6104, & 6103 respectively. See Land Dept File TL 12-2

FIELD BOOK
PL - 9
PL - 6
PL - 31

PAGE
18
24
12-15 & 20-22

BM - Std Survey Mon @ E Int of Topanga Canyon Blvd & Devonshire St. Elev 960.346 - (1960 Adj.)
B.M. No. 05-00540

100 50 0 100 200 300

SCALE IN FEET

* Use Graphic Scale on Reduced Prints

This Dwg. Partially Replaces Y-4103 Dated 2-8-27

CRIMSON PIPELINE LLC

3760 Kilroy Airport Way, Suite 300
Long Beach, California 90806

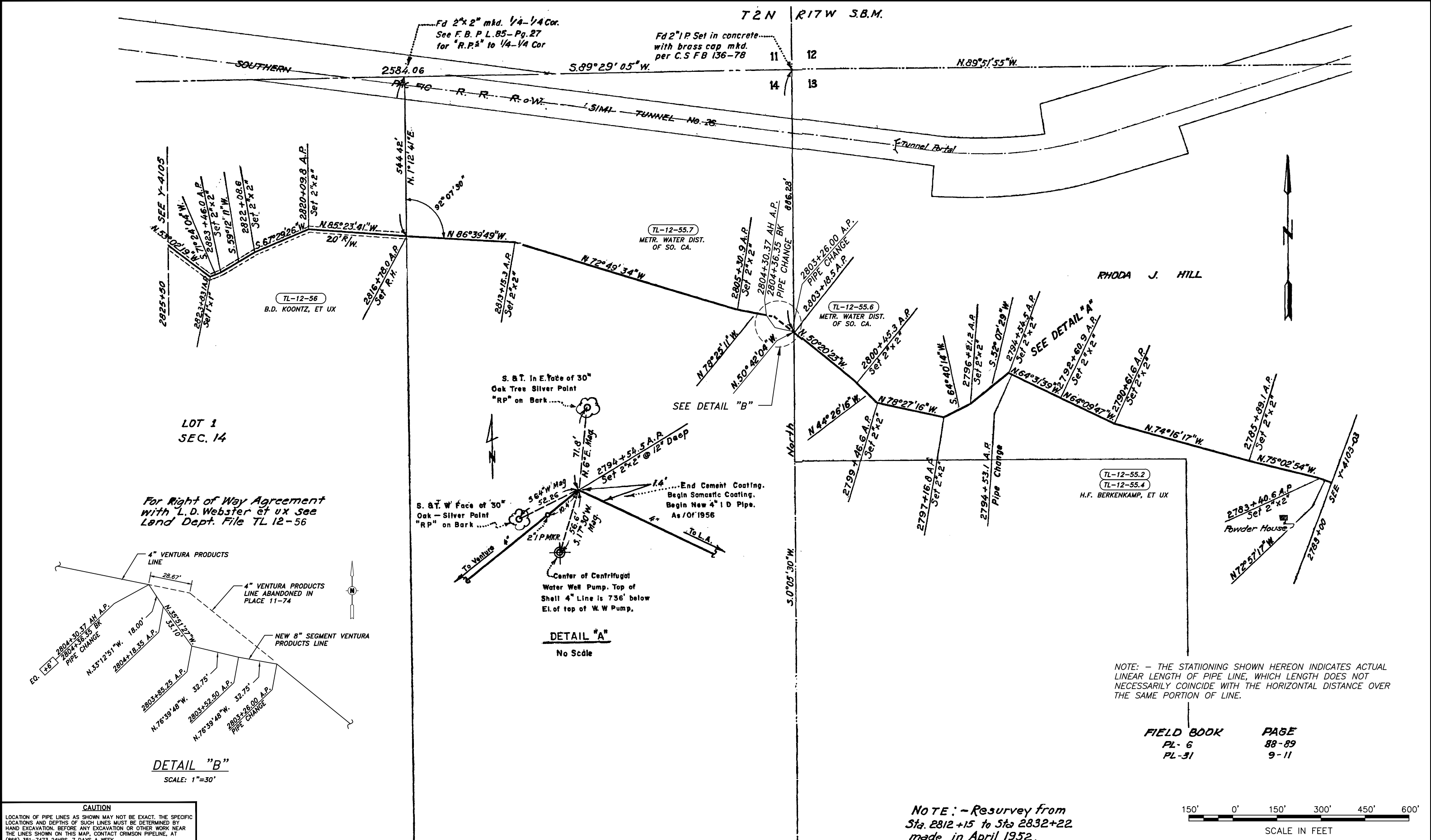
DATE 1-27-69
DRAWN BY Fleming
CHECKED BY
APPROVED BY

SCALE 1" = 100' HORIZ.
1" = 4' VERT

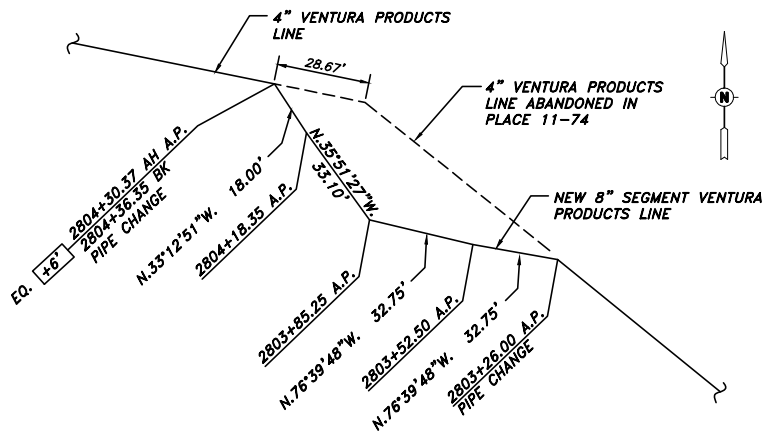
Y-4103-03

REVISED 3-19-74 (JOB 5-138) F.C.

STATION TO STATION	SIZE I.D.	DESCRIPTION	Date Installed	W.O.
2760+90.09	2772+78.35	6.249	X-52 Sam Coated	1-1969
2772+78.35	2773+74.10 To W. EQ.	4.03	Std. Line Sam. Ctd.	1-1969
2773+74.10 To W. EQ.	2772+81.77 Fr. E.			
2772+81.77 Fr. E.	2794+53.10	3.66	Am. Seamless	1927



For Right of Way Agreement
with L.D. Webster et ux See
Land Dept. File TL 12-56



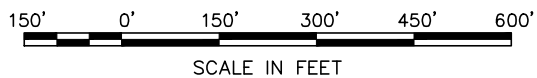
DETAIL "B"
SCALE: 1"=30'

DETAIL "A"
No Scale

NOTE: - THE STATIONING SHOWN HEREON INDICATES ACTUAL
LINEAR LENGTH OF PIPE LINE, WHICH LENGTH DOES NOT
NECESSARILY COINCIDE WITH THE HORIZONTAL DISTANCE OVER
THE SAME PORTION OF LINE.

FIELD BOOK PAGE
PL- 6 88-89
PL-31 9-11

NOTE: - Resurvey from
Sta. 2812+15 to Sta. 2832+22
made in April 1952.



CAUTION
LOCATION OF PIPE LINES AS SHOWN MAY NOT BE EXACT. THE SPECIFIC
LOCATIONS AND DEPTHS OF SUCH LINES MUST BE DETERMINED BY
HAND EXCAVATION. BEFORE ANY EXCAVATION OR OTHER WORK NEAR
THE LINES SHOWN ON THIS MAP, CONTACT CRIMSON PIPELINE, AT
(866) 351-7473 24HRS. 7 DAYS A WEEK

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Appendix G
Qualifications of the Environmental Professionals

COLIN P. YOUNG, CIH

PROFESSIONAL HISTORY

Current

- C Young Associates (CYA), La Jolla, California, 1996-2000, 2003, 01/2009-Present

Previous

- ERM-West, Inc., San Diego, California, Partner-Managing Principal, San Diego Office, 12/03-01/09
- Geocon, Inc., San Diego, California, Vice President/Southern California Operations Manager, 2000-2003, Project Manager/ Marketing Coordinator, 1989-1991
- Metcalf & Eddy, Inc., San Diego, California, Associate/Business Manager-Environmental Services Division, October 1994-1996
- University of California, San Diego (UCSD), Instructor for Occupational Medicine/Public Health & Safety Extension Certificate Program, 1992-2003
- Brown & Root Environmental/Halliburton NUS Corporation
 - San Diego, California, West Region Manager-Western Division Operations, 1991-1993
 - Boston, Massachusetts, U.S. EPA, Region 1 FIT Public Health Specialist, 1982-1985
- Westec Services, Inc./ERCE, San Diego, California, Project Manager/ Manager of Corporate Health & Safety, 1986-1989

PROFESSIONAL EXPERIENCE and QUALIFICATIONS-Academic

- UCSD, Course Instructor for Occupational Medicine Certificate Program, *Industrial Hygiene for the Occupational Health Nurse*, 1992-1995
- UCSD, Course Instructor for Occupational Health & Safety/ Hazardous Materials Certificate Program, *Principles in Industrial Hygiene*, 1995-2003

PROFESSIONAL EXPERIENCE and QUALIFICATIONS-Technical

Industrial Hygiene

Provide, or have provided, forensic investigation, human health assessment and exposure/injury prevention related services, including the performance of "sick-building"/indoor air quality evaluations, worker exposure assessments, biological contamination (e.g., bioaerosol/mold) studies, litigation support, workers' comp. investigations, asbestos and lead assessments, industrial process safety evaluations, health & safety training and support programs for environmental, hazardous waste, industrial and construction projects and activities. Services have been provided to legal, insurance, industrial, commercial and governmental (e.g., Navy, DOE, regulatory, etc.) clients, alike. Experience representations are summarized, as follows:

- Provide technical and risk management counsel on civil and exposure/toxic tort matters involving alleged environmental impairment and human exposures to hazardous materials, including chemicals and bioaerosols. To date, approximately 200 legal matters have been

supported.

- Provided industrial hygiene/health & safety support and programs for more than 400 environmental and hazardous waste investigations and remediation programs for the US EPA and private entities. Typical projects involved the handling of, and/or potential for exposure to, biological contaminants, fuel and chlorinated hydrocarbons, pesticides, PCBs, asbestos, lead and explosive materials.
- Performed numerous surveys of commercial, industrial and residential structures believed to contain unhealthy and/or potentially hazardous indoor air-quality conditions, including chemical and bioaerosol intrusion.
- Performed numerous industrial process safety evaluations in support of both Workers' Compensation claim-reduction (i.e., limitation of liability) programs and impending Workers' Compensation claims. The services have been provided for the benefit of employers, property owners and business/property insurers and legal counsel.
- Provided training and developed corporate health and safety programs for more than thirty industrial facilities, environmental laboratories and/or engineering consulting firms.
- Performed a Job Safety Analysis (JSA) of more than 300 aerospace manufacturing processes in support of the company's existing and developing Industrial Health & Safety Program.
- Developed and managed a complex health and safety program for a multi-million dollar remediation project for the Department of Energy at Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The remedial and site safety program innovatively employed the use of remotely operated vehicles (i.e., submarines) to retrieve and decommission over 7000 containers of explosive, water-reactive and radiologically-contaminated materials.
- Developed and managed a health & safety/quality assurance-quality control (QA/QC) program for a study involving the assessment of 15 uncontrolled disposal sites at the Naval Air Weapons Station (NAWS) in China Lake, California. The studies evaluated the degree of environmental impact from chemical, biological and live ordnance wastes in the (typical) 115°F area climate.
- Contributed to the development of health and safety Standard Operating Procedures and training protocols currently used by each of the U.S. EPA FIT, Zone 1 offices.

Environmental Engineering

Provide, or have provided, forensic studies, environmental site assessments; remediation programs; environmental litigation support, and; regulatory compliance support and permitting.

- Developed and managed a multimillion-dollar burn dump remediation project for a client who was redeveloping a former Navy facility. Provided project management and oversight, data interpretation, training, and HASP development. The contaminants of concern include burn ash, lead, asbestos, PCBs, chlorinated and/or petroleum hydrocarbons.
- Managed multiple environmental assessments and mitigation programs of former

agricultural properties. Many possessed impairment by the historic and legal application of pesticides and/or natural occurrence of arsenic. In all situations, the impairment was managed on-site by controlled burial of the impaired soils, resulting in no need for costly or wasteful removal, transport and treatment/disposal of the same.

- Provided technical support for an underground storage tank (UST) investigation at San Diego International Airport's (Lindbergh Field) tank farm. The project was performed for the local Port Authority and involved the in situ inspection of the interior of numerous fuel tanks throughout the fuel farm. This activity required the use of Level B PPE in confined space environments.
- Provided management of a million-dollar environmental design contract for Naval Public Works Center (PWC), San Diego, California. Services included the development of SPCC Plans, preparation of RCRA Part B permits, performance of cathodic protection evaluations and the design of TSD facilities.
- Planned and managed a multitude of UST investigations for the Department of Defense at MCB Camp Pendleton, North Island NAS and 32nd Street Naval Station, California. The results of each investigation were used to develop remediation specifications for MCON projects planned at each site. The remedial programs were subsequently implemented using fixed or unit-cost pricing structures dependent on the prepared specifications. Remediation technologies applied included controlled aeration, vapor extraction (VES), pump and treat, and dig and dispose. All of the projects were performed either on or under budget.
- Provided operations management of a multi-million dollar fuel recovery/remediation project at the fuel farm at Naval Air Station North Island (NASNI), California. Ground water at the site had been impaired by a 2-3 foot thick layer of fuel hydrocarbon, released from a multitude of concrete USTs on the base. The remediation technology applied to date included pump and treat.
- Provided Delivery Order management of a large-scale asbestos survey project at Naval Amphibious Base, Coronado for Southwest Division NAVFACENGCOM.
- Planned and managed an assessment and remediation project at Fire Fighting Training Areas at Pacific Missile Test Center (PMTTC) in Point Mugu and CBC Port Hueneme, California, for the Western Division NAVFACENGCOM. The remedial programs were subsequently implemented using fixed or unit-cost pricing structures dependent on the prepared specifications. Remediation technologies applied included VES and dig and dispose. Each of the projects was performed under budget.
- Removed and performed an investigation of multiple USTs located on agricultural property owned by the Viejas Indian Reservation. The property is slated for Casino and Resort expansion.
- Performed a UST investigation at several commercial service stations. Determined MTBE impacts to beneficial-use ground water. Data used to initiate a ground water investigation and remediation plans.
- Provided environmental support and waste characterization services for engineering (i.e.,

clean-out) projects performed within lead-impacted storm water basins throughout San Diego County.

- Provided technical and environmental management support for numerous engineering projects performed within lead-impacted areas along the highways of Orange County. Formulated a Lead Management Plan for the engineering/utility contractor providing the construction services for Caltrans.
- Provided environmental compliance support services to supplement an aerospace manufacturing company's environmental department. Products supported include the Hazardous Materials Business Plan, Storm Water Pollution Prevention (SWPP) Plan, Underground Storage Tank (UST) Program, Compliance Audit Program, etc.
- Providing environmental support to the owners of a property involved in litigation over the condemnation of the property by the local municipality acquisition.

ACADEMIC HISTORY

- University of Massachusetts, Amherst, Massachusetts, B.S., School of Environmental Science and Public Health, 1982
- Harvard School of Public Health, Boston, Massachusetts, Certificate of Risk Analysis in Environmental Health, 1985

PROFESSIONAL CERTIFICATIONS

- Certified Industrial Hygienist (CIH) No. 3987, American Board of Industrial Hygiene (ABIH), 1988; Recertified 1995, 2001, 2006, 2011, 2015
- Certified Safety Specialist/Executive (CSS/CSE), World Safety Organization (WSO), 1986 (inactive)
- AHERA-Certified Asbestos Inspector-California No. 855, U.S. EPA/UC Berkeley, 1989 (inactive)

PROFESSIONAL TRAINING

- Certificate in Professional Engineering Practice, ASFE/Institute for Professional Practice, 1990
 - Program Facilitator, 1991
- Professional "Loss Prevention" Training, ASFE, 1989
- Professional Management Training, Management Action Programs (MAP), 1990
- HazWOpER (29CFR 1910.120) Training, 1982; - Trainer, 1986-Present
- Guidelines for the Assessment of Microbiological Contamination, AIHA, 2002

PUBLICATIONS

- Fung M.D., F. Y., Young CIH, C. P., Mold-Associated Asthma, IAQ 2001, ASHRAE

PROFESSIONAL AFFILIATION HISTORY

- American Industrial Hygiene Association (AIHA), Fairfax, VA
- American Academy of Industrial Hygiene (AAIH), Lansing, MI
- American Lung Association, San Diego and Imperial Counties, CA, Member-Board of Directors, 2002-2006, Board Chair 2006
- ASFE, Silver Spring, MD
 - "Loss Prevention Education" Committee (1990-1991)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Association for Environmental Health and Sciences (AEHS), Amherst, MA
- American Conference of Governmental Industrial Hygienists (ACGIH), Cincinnati, OH
- Institute for Professional Practice (IPP), Silver Spring, MD
- Society of American Military Engineers (SAME), San Diego, CA
- American Indoor Air Quality Council

DANIEL A. WEIS, R.E.H.S.

PROFESSIONAL HISTORY

Current

- C Young Associates (CYA), La Jolla, California, Senior Associate/Technical Advisor, 01/2009-Present
- Advantage Environmental Consultants (AEC), San Marcos, California, Branch Manager, 11/2005-Present

Previous

- Rincon Consultants, Carlsbad, California, Project Manager, 11/2003-11/2005
- Geocon, Inc., San Diego, California, Project Manager, 11/2001-11/2003
- Geosoils, Inc., Carlsbad, California, Field Technician, 11/1999-11/2001

PROFESSIONAL EXPERIENCE SUMMARY

17 years of experience in the environmental sciences consulting field. Responsibilities include client development and management, project management, technical oversight and quality control for assessment, and remediation and construction oversight services. Clients include, but are not limited to, local government entities, developers (affordable housing and market rate), Federal government entities, law firms, architectural and engineering firms, commercial lending institutions, conservancies, commercial/industrial real estate owners/managers, insurance companies, wireless telecommunication carriers and other real estate developers. Experienced in the completion of assessment, construction and remediation quality assurance during the completion of urban redevelopment/brownfields projects, many of which have been located in downtown areas of San Diego, Los Angeles, Oakland, San Francisco, and other urban communities throughout the State of California.

Completed or managed over 2,500 due diligence related environmental assessments and completed or managed over 500 subsurface environmental investigations of soil gas, soil, groundwater and other media. Investigations have included human health and ecological risk assessments, evaluations of indoor air conditions based on interpretations of subsurface conditions, underground storage tank (UST) evaluation/closure and hazardous waste characterization/management. Subsurface activities performed include the completion of soil borings using various drilling technologies, soil and groundwater sampling, installation and sampling of groundwater monitoring wells, free product evaluations, exploratory trenching and real-time delineation using mobile analytical laboratories and other soil screening technology. Assets evaluated include industrial, commercial, residential, agricultural and vacant land sites throughout the State of California and numerous other states, with many of the assessments completed under the regulatory oversight of local environmental regulatory agencies, the California Regional Water Quality Control Boards (RWQCBs) and the California Environmental Protection Agency Department of Toxic Substances Control (DTSC). Has also conducted and/or managed hundreds of public/environmental health related assessments including electromagnetic field surveys, radionuclide surveys, indoor air quality investigations, radon surveys, drinking water assessments, asbestos containing materials (ACM) and lead-based paint (LBP) surveys and mold/microbial evaluations.

Managed over 100 remediation or construction management related projects primarily related to source removal of subsurface contaminants, including but not limited to, petroleum hydrocarbons, chlorinated solvents, heavy metals, organochlorine pesticides and other agricultural related chemicals, dioxins and furans and polychlorinated biphenyls (PCBs). Has also assisted in cost recovery efforts from private parties and State/Federal funding programs for environmental assessment and remediation work and has served as an expert witness during legal proceedings pertaining to environmental related claims.

SPECIFIC PROJECT EXPERIENCE

- 14th and Island, San Diego, California – Development of Site Mitigation Plan, contaminated soil management and disposal concurrent with site construction activities at the superblock construction site in downtown San Diego and achievement of regulatory closure with the County of San Diego Department of Environmental Health.
- 2198 Market Street, San Francisco, California – Phase I and II Environmental Site Assessments, supplemental subsurface investigation, Site Mitigation Plan development, contaminated soil management and disposal concurrent with site construction activities and negotiation/achievement of regulatory closure with the City of San Francisco Department of Public Health.
- Former EZ Serve, 9305 Mission Gorge Road, Santee, California – Closure report preparation and San Diego Regional Water Quality Control Board interface and negotiation/achievement of regulatory closure under State of California low-threat policy.
- French Field – Former Vista Burn Dump, Oceanside, California – Oversight of the capping of a former burn dump/landfill facility and restoration for public use as a sports facility. Negotiation and achievement of regulatory closure with the California Department of Toxic Substances Control with concurrence from the San Diego Regional Water Quality Control Board and the County of San Diego Local Enforcement Agency.
- Indoor Skydiving Facility, 1401 Imperial Avenue, San Diego, California – Development of Soil Management Plan and contaminated soil management and disposal concurrent with site construction activities in downtown San Diego.
- Lemon Grove Avenue Realignment Project, Lemon Grove, California – Development of Impacted Soil Management Plan, Community Health and Safety Plan and Worker Health and Safety Plan and oversight of the implementation of such plans during construction activities.
- North Side Interior Road and Utilities Project at San Diego International Airport, San Diego, California - Subsurface assessment, development of Soil Management Plan and Work Health and Safety Plan and implementation and monitoring of soil management strategies.
- Olympic and Hill, Los Angeles, California – Removal of multiple underground storage tanks and underlying contaminated soil and achievement of regulatory closure with the City of Los Angeles Fire Department.
- San Ysidro - U.S. Land Port of Entry, San Diego, California – Subsurface assessment and development and implementation of soil management strategies.
- Tabata Ranch Site, Carlsbad, California – Development of Soil Management Plan and Community Health and Safety Plan, completion of soil removal action of petroleum hydrocarbon impacted soil, oversight and management of selective reuse and replacement of

pesticide impacted soil and subsequent export of inert soils and achievement of regulatory closure with the County of San Diego Department of Environmental Health. Consent to discharge inert soils at an off-site receiving location was granted by the San Diego Regional Water Quality Control Board.

- VA Medical Center Long Beach, 5901 East 7th Street, Long Beach, California - VA Long Beach: Seismic Corrections – Mental Health, Community Living Center and Chiller Replacements Project – Asbestos containing materials and lead-based paint surveys and preparation of abatement contractor bid specifications.

EDUCATION

- Bachelor of Arts - University of Delaware, Newark, DE (1995)
- Master of Science – Public Health, San Diego State University, San Diego, CA (1998)

PROFESSIONAL REGISTRATIONS, LICENSES, AND CERTIFICATIONS

- Registered Environmental Health Specialist #8172 in the State of California
- OSHA 40-hour Hazardous Waste Operations Worker and Supervisor Certifications and Annual Refreshers

PUBLICATIONS

- Gersberg, R.M., Brown, C., Zambrano, V., Worthington, K., and Weis, D. (2000) Quality of urban runoff in the Tijuana River watershed. In Westerhoff, P. (editors), SCERP Monograph Series (no.2) on Water Issues Along the United States and Mexico Border. : Southwest Center for Environmental Research and Policy, 31-45.
- Weis, D.A., Callaway, J.C., and R.M. Gersberg (2001). Vertical Accretion Rates and Heavy Metal Chronologies in Wetland Sediments of the Tijuana Estuary. Estuaries 24(6A).
- Gersberg, R.M., Pitt, J.L., Weis, D.A., and D.D. Yorkey. Characterizing In-Stream Metal Loading in the Tijuana River Watershed. (2002). National TMDL Science and Policy Conference, Specialty Conference Proceeding on CD Rom, November 13-16, Phoenix, Arizona

PROFESSIONAL AFFILIATIONS

- Building Industry Association
- San Diego Environmental Professionals
- San Diego Housing Federation

APPENDIX I

HYDROLOGY AND HYDRAULIC ANALYSES



MWD

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

**Hydrology and Hydraulic Analyses for
West Valley Feeder No 1
Valve Structures Improvements (Stage 3)**



Project No.104924

May 2018

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SECTION 1 INTRODUCTION

1.1 GENERAL

West Valley Feeder No 1 and No 2 are Treated Water Pipelines that travel through Chatsworth Park South. There are several Pipeline Structures in Chatsworth Park South that are not accessible by Metropolitan maintenance vehicles. The primary objective of this project is to construct access roads to isolated pipeline structures and provide manholes to house pipeline structures. The project drainage system would be developed to protect the proposed access roads and pipeline structures from erosion and storm water runoff from adjacent hillsides. A hydrologic and hydraulic study was prepared to characterize the storm water runoff within the project area. Results of this study would be used to support final design of the proposed drainage system. This report was developed in support of this task and summarizes the existing and project hydrologic and hydraulics study conducted for the site.

Chatsworth Park South is a City of Los Angeles Department of Recreation and Parks (LADRP) facility located at 22360 West Devonshire Street in the community of Chatsworth, in the City of Los Angeles, County of Los Angeles, California (Figure 1). This site located in the western portion of the San Fernando Valley consists of a recreational building, an adjoining fenced children's play area, parking lots, sand pit play area, two tennis courts, a basketball court, and landscaped fields. Residential housing abuts the site boundary to the east; and undeveloped hillside terrain borders the site to the north, west, and south. Various recreational trails for pedestrians, hikers, and equestrian use surround the level park facility areas. A railroad right-of-way is adjacent to the north. The park was closed to public access and use during the spring of 2008 because of hazards associated with lead pellets and sporting clay pigeon (target) debris from a former onsite small arms firing range (SAFR). The park was remediated by the LADRP in 2017. The remedial plan included an engineered cap on the park area considered hazardous and implementation of storm water management practices that limit the runoff from the site. It is important to note that the area north of the park between West Valley Feeder No 1 and West Valley Feeder No 2 was not remediated with the engineered cap.

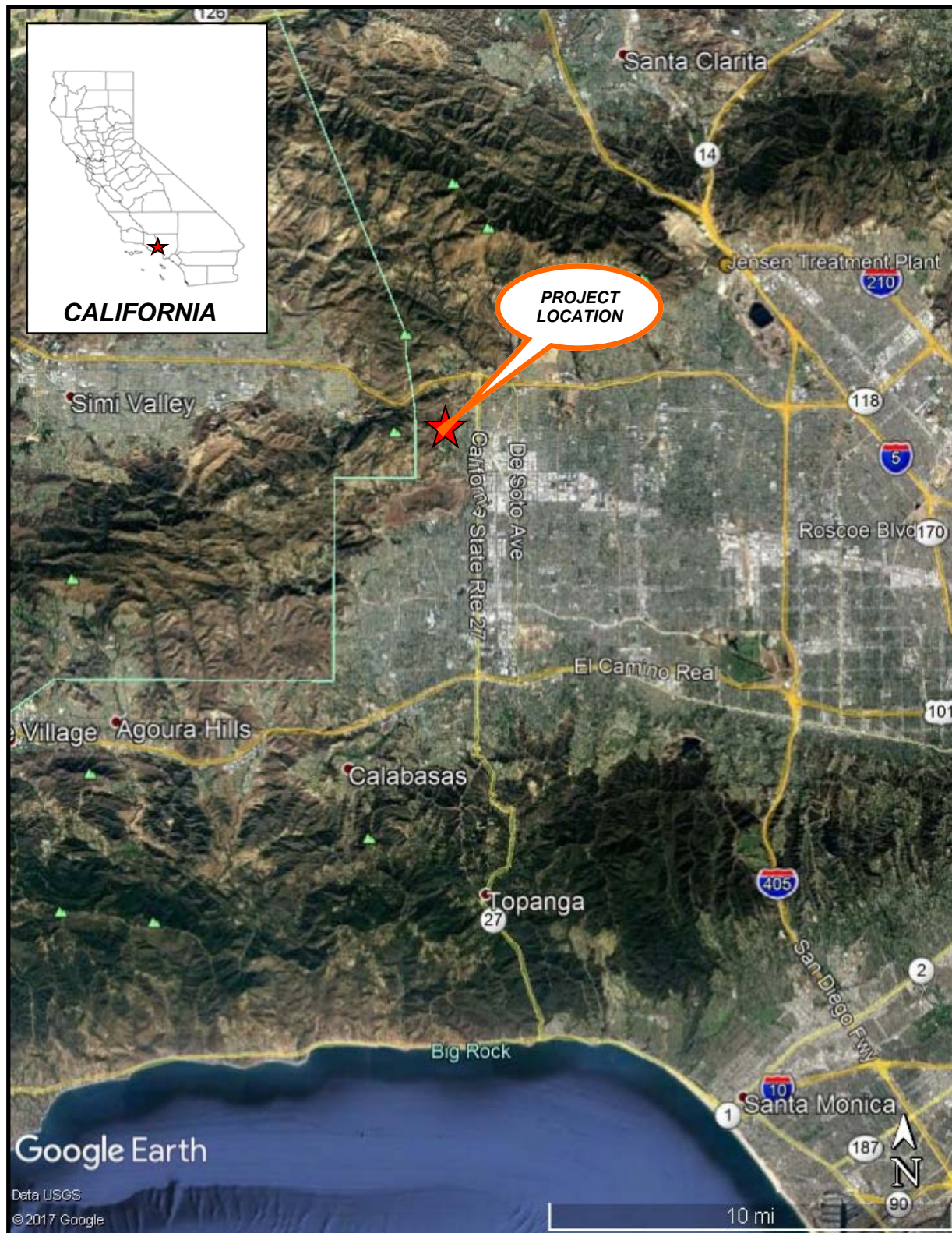


Figure 1 - Project Location

1.2 SITE DESCRIPTION

The site occupies a box canyon with hills that ascend from the level portion of the developed recreational area to the north, west, and south and west into the alluvial canyon bottom with surface flow generally towards the east. A former fishing pond located northeast of the former SAFR was previously filled using onsite groundwater production and through damming of seasonal stream flows that drained from the upland areas to the west.

The existing drainage pattern mimics the historic predevelopment drainage conditions. The main drainage is along the alluvial canyon bottom (Figure 2) with surface flow generally towards the east and south towards the remediated park detention basins (Figure 3). The drainage path is shown as a blue line stream on the U. S. Geological Survey (USGS) topographic quadrangle (Figure 3). Several drainage culverts, pipes and detention basins were placed across the park to facilitate storm water runoff.



Figure 2 - WVF1 STA 1407+45 at Stream Crossing and WVF1 STA 1416+33 at Stream Bottom



Figure 3 - Canyon Drainage Path and USGS Blue Stream

Storm water runoff from the north-west of the project site sheet flows from the surrounding hillsides towards a central canyon bottom where it is conveyed towards WVF1 STA 1416+33. Runoff continues into an earthen flood control basin located south of the proposed access road and spills through a broken spillway into a Stone Lined stream leading to the park Detention Basins (Figure 4). Storm water runoff on the northerly side of the project site sheet flows towards a central canyon bottom where it is conveyed near WVF1 STA 1407+45. The northerly runoff joins the north-west runoff past WVF1 STA 1407+45 and continues into the Stone Lined stream towards the park Detention Basins (Figure 5). There is a non-operational culvert along the proposed access road alignment that was used to facilitate runoff from a small hillside tributary north of the road.



Figure 4 - Earthen Flood Control Basin and Broken Spillway



Figure 5 - Stone Lined Stream and Park Detention Basin

SECTION 2 HYDROLOGY ANALYSES

2.1 DRAINAGE BOUNDARIES AND DESIGN DISCHARGE

The existing condition drainage boundaries for the study area were delineated using two USGS digital elevation models (DEM) for 7.5-minute Oat Mountain Quadrangle and Simi Valley East Quadrangle overlaid with a ground survey prepared by Metropolitan through Survey Job Number 06-158. For project conditions, the project grading plan was overlaid on the USGS DEM. The horizontal datum for the topographic data is North American Datum of 1983 (NAD 83); the vertical datum is North American Vertical Datum of 1988 (NAVD 88). The total watershed for the project was 142 acres.

The Los Angeles County Department of Public Works (LACDPW) Modified Rational Method was used for completing the hydrologic analyses for this study. The LACDPW Tc Calculator was used to implement the MODRAT for each subarea to calculate peak flows. Soil Type, land use, rain depth, temporal distribution series were obtained from LACDPW hydrology manual hydrologic map and Los Angeles County GIS files.

MWD's distribution system is considered critical infrastructure. Design of improvements will be based on 100-year return period storms, similar storm events, or the regulating agency's recommended flow. Distribution system manholes that are subject to flooding will be raised to at least 1-foot above the 100-year water surface elevation.

Access related improvements are not as critical as structure or pipeline protection therefore the general approach is to design these improvements based on LACDPW's Capital Flood Protection criteria.

2.2 EXISTING CONDITIONS

A site walk was completed on March 15, 2017, to verify location of any catch basins, culverts, general drainage patterns and land use. The initial drainage boundary delineation was adjusted based on findings from the site walk. Exhibit 1 shows the existing watershed delineation. The watershed currently drains to the park Detention Basins.

Hydrologic model parameters such as sub-basin areas, basin slopes were calculated using the LACDPW's 2006 Hydrology Manual Section 7.2 Rational Method. The time of concentration was calculated using the LACDPW's Tc calculator. The results of the hydrologic analysis and supporting documentation can be found in Appendix A.

2.3 PROJECT CONDITIONS

The drainage boundaries for the project conditions, for the most part, remain similar to those of the existing conditions. The proposed access roads will consist of concrete pavement at steep slopes with v-ditches to convey runoff away from the road. Vented Ford style water crossings will be placed at sites where the access road crosses a stream. Grouted stone is recommended for erosion control at sites where pipeline structures are exposed to stream erosion. Existing canyon flow is retained and acts as the main drainage feature across the project site. Major changes between the existing and project conditions occur at the outlet of Subareas A3 and A7. The hydrology map for project conditions is shown on Exhibit 1.

The project grading plans incorporate two possible access roads with water crossing features near West Valley Feeder No 1 STA 1407+45 and West Valley Feeder No 1 STA 1416+33. The high water surface elevations at these two sites were calculated to determine the size of the water crossings and the extent of erosion protection.

The results of the hydrologic analyses for the proposed project conditions are shown in Table 1. All hydrologic calculations and supporting documentation for project conditions can be found in Appendix A. Results of hydraulic calculations for water crossings are shown in Appendix B.

Table 1- Summary of Hydrology Analyses

Water Crossing	100-Year (cfs)	50-Year (cfs)	2-Year (cfs)
WVF1 STA 1407+45 (Subarea A7, Node 21)	162	138	28
WVF1 STA 1416+33 (Subarea A1, A2 and A3, Node 15)	393	337	72

SECTION 3 HYDRAULIC ANALYSES

3.1 VENTED FORD CROSSINGS

The project grading concept includes “Vented Ford” or Culvert crossings to convey flow across access the access road at two stream crossing locations. The Vented Fords were sized using the results of the Hydrologic Analyses and the U.S. Department of Transportation Federal Highway Administration HY-8 Culvert Hydraulic Analyses Program. Culvert designs include headwalls at both ends and energy dissipater structures at culvert outlets. The culvert sizing calculations are provided in Appendix B.

3.2 ROAD DRAINAGE

Road drainage design reduces energy generated by flowing water. The drainage system includes v-ditches to catch roadway flows and convey them to the culvert inlets. Roadway overtopping was calculated using the HY-8 Culvert Hydraulic Analyses Program. Typical roadway sections are shown in Appendix C.

SECTION 4 CONCLUSIONS AND RECOMMENDATIONS

The Hydrology and Hydraulics Analyses conducted on the existing and proposed systems evaluated the project drainage system to adequately protect the proposed access roads. The existing condition 50-Year peak flow at WVF1 STA 1407+45 was determined to be 138 csf and at WVF1 STA 1416+33 was 337 cfs. There is no significant increase in runoff expected between existing conditions and project conditions.

As part of stream crossing design, culverts were incorporated as protective features for the roadway. Box culverts sizes 4ft provide adequate Capital Flood protection when used with v-ditches, headwalls and energy dissipaters.

SECTION 5 REFERENCES

1. Los Angeles County Department of Public Works, 2006. Hydrology Manual. January.
2. Los Angeles County Department of Public Works. Hydraulic Design Manual. March.
3. U.S. DOT Federal Highway Administration, 2012. Hydraulic Design of Highway Culverts. April.
4. NOAA, National Climatic Data Center.
5. USGS, StreamStats

SECTION 6 APPENDICES

Appendix A – Hydrology Analysis

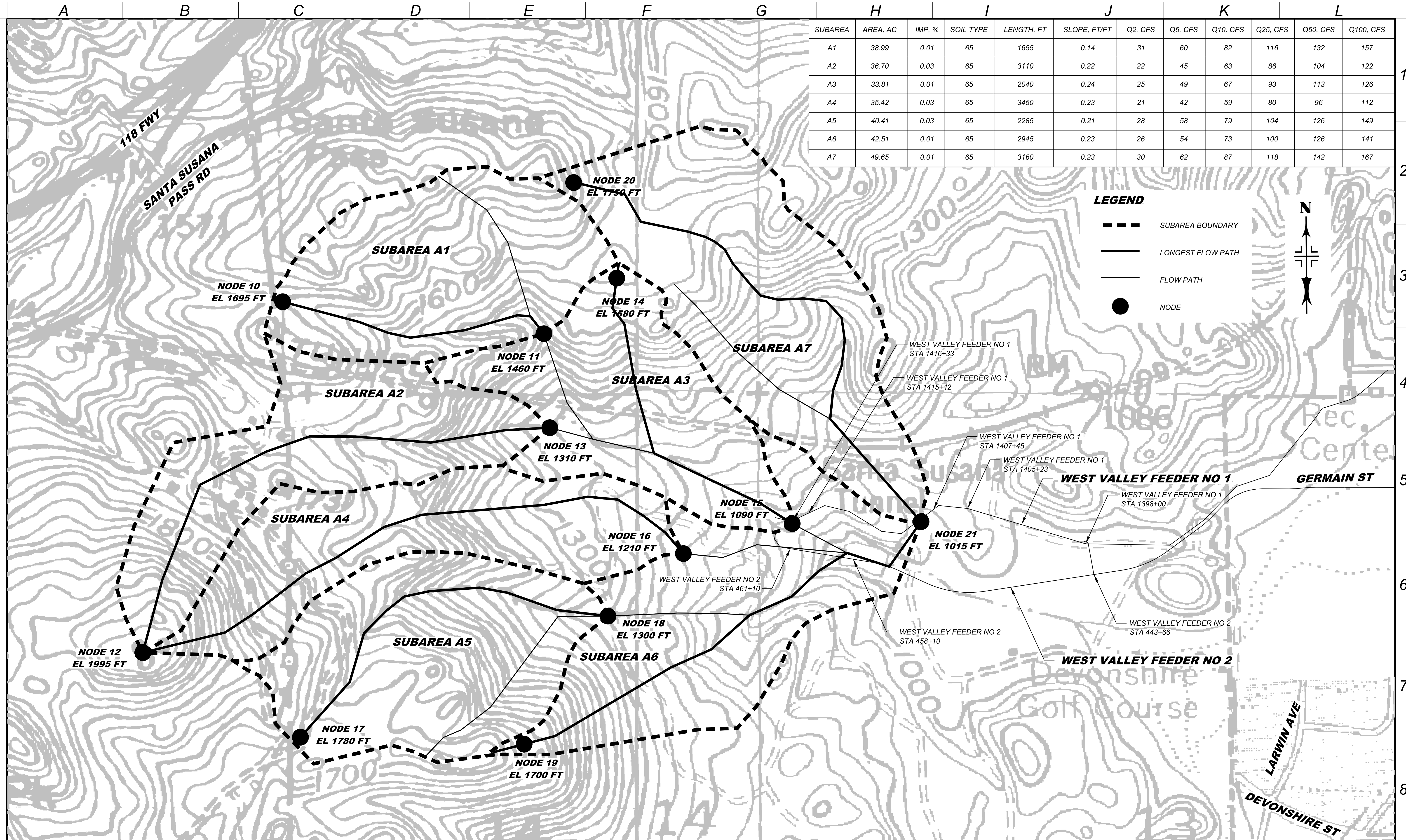
Appendix B – Culvert Crossing Calculations

Appendix C – Preliminary Design Drawings

Appendix A

Hydrology Analyses

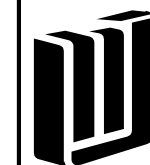
H			I		J		K			L	
SUBAREA	AREA, AC	IMP. %	SOIL TYPE	LENGTH, FT	SLOPE, FT/FT	Q2, CFS	Q5, CFS	Q10, CFS	Q25, CFS	Q50, CFS	Q100, CFS
A1	38.99	0.01	65	1655	0.14	31	60	82	116	132	157
A2	36.70	0.03	65	3110	0.22	22	45	63	86	104	122
A3	33.81	0.01	65	2040	0.24	25	49	67	93	113	126
A4	35.42	0.03	65	3450	0.23	21	42	59	80	96	112
A5	40.41	0.03	65	2285	0.21	28	58	79	104	126	149
A6	42.51	0.01	65	2945	0.23	26	54	73	100	126	141
A7	49.65	0.01	65	3160	0.23	30	62	87	118	142	167



SCALE BARS

STAMPING ENGINEER IS RESPONSIBLE FOR CURRENT DRAWING REVISION

ISSUE DESCRIPTION



MWD
METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA

DESIGNED BY:

FOR DRAWING APPROVALS SEE

DRAWN

N/A

	CHECKED
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DISTRIBUTION SYSTEM
WEST VALLEY FEEDER NO. 1
VALVE MODIFICATION STAGE 3
CHATSWORTH PARK

HYDROLOGY STUDY

SPECIFICATIONS

DR |

PROJECT NUMBER	104561
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SHEET
EXHIBIT-1

DWG	REV
N/A	0

USER NAME: u10100

USER NAME: u10100
PLOT TIME: Wednesday May 30, 2018 06:53

2006 Los Angeles County Hydrology Manual

Appendix B - Hydrological Maps
USGS Map Grids: Oat Mountain, Santa Susana
Soil Classification Area - 65
Debris Potential Area - 4

Appendix C - Soil Type and Runoff Coefficient Data

Soil Identification Table		
Number	Original Name	Name
65	ULAR-13	UPPER LOS ANGELES RIVER

See Runoff Coefficient Curve Soil Type No 65

Table 6.3.3 - Design Fire Factors
Los Angeles River Watershed - 0.71

WATERSHED DATA													
SUBAREA	AREA, AC	IMPERVIOUS, %	SOIL TYPE	HIGH EL, FT	LOW EL, FT	LENGTH, FT	SLOPE, FT/FT	50 YR 24 HR	2 YR 24 HR	5 YR 24 HR	10 YR 24 HR	25 YR 24 HR	100 YR 24 HR
A1	38.99	0.01	65	1695	1460	1655	0.14	7.6	2.9	4.4	5.4	6.7	8.5
A2	36.7	0.03	65	1995	1310	3110	0.22	7.4	2.9	4.3	5.3	6.5	8.3
A3	33.81	0.01	65	1580	1090	2040	0.24	7.5	2.9	4.4	5.4	6.6	8.4
A4	35.42	0.03	65	1995	1210	3450	0.23	7.4	2.9	4.3	5.3	6.5	8.3
A5	40.41	0.03	65	1780	1300	2285	0.21	7.4	2.9	4.3	5.3	6.5	8.3
A6	42.51	0.01	65	1700	1015	2945	0.23	7.4	2.9	4.3	5.3	6.5	8.3
A7	49.65	0.01	65	1750	1015	3160	0.23	7.5	2.9	4.4	5.4	6.6	8.4

RESULTS				URS CHATSWORTH PARK HYDROLOGY REPORT		
Confluence Point	Q10, CFS	Q50, CFS	Q100, CFS	Q10, CFS	DIFF, CFS	PERCENT
CONFLUENCE AT NODE 15	204	337	393	172.64	31	18%
CONFLUENCE AT NODE 21 WEST	405	673	783	370.7	34	9%
CONFLUENCE AT NODE 21 NORTH	83	138	162	65.2	17	27%

- Q50 IS THE CAPITAL FLOOD OR DESIGN STORM PER LOS ANGELES COUNTY HYDROLOGY MANUAL

RAINFALL FREQUENCY MULTIPLICATION FACTORS	
FREQUENCY, YR	FACTOR
2	0.387
5	0.584
10	0.714
25	0.878
50	1
100	1.122
500	1.402

Los Angeles County HydroCalc Calculator Version 1.0.3

Summary of Input Data

Project	Subarea	Area	Length	Slope	Depth	Imp	Soil	Frequency	Fire
CP2	A1	38.99	1655	0.1420	7.6	0.01	65	2-yr	0.71
CP2	A2	36.7	3110	0.2203	7.4	0.03	65	2-yr	0.71
CP2	A3	33.81	2040	0.2402	7.5	0.01	65	2-yr	0.71
CP2	A4	35.42	3450	0.2275	7.4	0.03	65	2-yr	0.71
CP2	A5	40.41	2285	0.2626	7.4	0.03	65	2-yr	0.71
CP2	A6	42.51	2945	0.2326	7.4	0.01	65	2-yr	0.71
CP2	A7	49.65	3160	0.2326	7.5	0.01	65	2-yr	0.71
CP5	A1	38.99	1655	0.1420	7.6	0.01	65	5-yr	0.71
CP5	A2	36.7	3110	0.2203	7.4	0.03	65	5-yr	0.71
CP5	A3	33.81	2040	0.2402	7.5	0.01	65	5-yr	0.71
CP5	A4	35.42	3450	0.2275	7.4	0.03	65	5-yr	0.71
CP5	A5	40.41	2285	0.2626	7.4	0.03	65	5-yr	0.71
CP5	A6	42.51	2945	0.2326	7.4	0.01	65	5-yr	0.71
CP5	A7	49.65	3160	0.2326	7.5	0.01	65	5-yr	0.71
CP10	A1	38.99	1655	0.1420	7.6	0.01	65	10-yr	0.71
CP10	A2	36.7	3110	0.2203	7.4	0.03	65	10-yr	0.71
CP10	A3	33.81	2040	0.2402	7.5	0.01	65	10-yr	0.71
CP10	A4	35.42	3450	0.2275	7.4	0.03	65	10-yr	0.71
CP10	A5	40.41	2285	0.2626	7.4	0.03	65	10-yr	0.71
CP10	A6	42.51	2945	0.2326	7.4	0.01	65	10-yr	0.71
CP10	A7	49.65	3160	0.2326	7.5	0.01	65	10-yr	0.71
CP25	A1	38.99	1655	0.1420	7.6	0.01	65	25-yr	0.71
CP25	A2	36.7	3110	0.2203	7.4	0.03	65	25-yr	0.71
CP25	A3	33.81	2040	0.2402	7.5	0.01	65	25-yr	0.71
CP25	A4	35.42	3450	0.2275	7.4	0.03	65	25-yr	0.71
CP25	A5	40.41	2285	0.2626	7.4	0.03	65	25-yr	0.71
CP25	A6	42.51	2945	0.2326	7.4	0.01	65	25-yr	0.71
CP25	A7	49.65	3160	0.2326	7.5	0.01	65	25-yr	0.71
CP50	A1	38.99	1655	0.1420	7.6	0.01	65	50-yr	0.71
CP50	A2	36.7	3110	0.2203	7.4	0.03	65	50-yr	0.71
CP50	A3	33.81	2040	0.2402	7.5	0.01	65	50-yr	0.71
CP50	A4	35.42	3450	0.2275	7.4	0.03	65	50-yr	0.71
CP50	A5	40.41	2285	0.2626	7.4	0.03	65	50-yr	0.71
CP50	A6	42.51	2945	0.2326	7.4	0.01	65	50-yr	0.71
CP50	A7	49.65	3160	0.2326	7.5	0.01	65	50-yr	0.71
CP100	A1	38.99	1655	0.1420	7.6	0.01	65	100-yr	0.71
CP100	A2	36.7	3110	0.2203	7.4	0.03	65	100-yr	0.71
CP100	A3	33.81	2040	0.2402	7.5	0.01	65	100-yr	0.71
CP100	A4	35.42	3450	0.2275	7.4	0.03	65	100-yr	0.71
CP100	A5	40.41	2285	0.2626	7.4	0.03	65	100-yr	0.71
CP100	A6	42.51	2945	0.2326	7.4	0.01	65	100-yr	0.71
CP100	A7	49.65	3160	0.2326	7.5	0.01	65	100-yr	0.71

Los Angeles County HydroCalc Calculator Version 1.0.3

Summary of Output Data

Subarea	Modeled (2-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	2.9	17	28	2.22	31	0.99	0.73	0.74
A2	2.9	25	20	2.11	22	0.80	0.68	0.69
A3	2.9	18	23	1.88	25	0.95	0.72	0.72
A4	2.9	27	19	2.03	21	0.77	0.67	0.68
A5	2.9	20	26	2.33	28	0.89	0.71	0.71
A6	2.9	24	24	2.30	26	0.82	0.69	0.69
A7	2.9	25	28	2.75	30	0.81	0.68	0.69

Subarea	Modeled (5-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	4.4	12	57	4.45	60	1.75	0.83	0.83
A2	4.3	17	43	4.15	45	1.45	0.80	0.80
A3	4.4	13	46	3.77	49	1.67	0.82	0.82
A4	4.3	18	40	4.00	42	1.41	0.80	0.80
A5	4.3	13	55	4.58	58	1.65	0.82	0.82
A6	4.3	16	51	4.63	54	1.49	0.81	0.81
A7	4.4	17	59	5.53	62	1.47	0.80	0.81

Subarea	Modeled (10-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	5.4	10	79	6.36	82	2.34	0.87	0.87
A2	5.3	14	60	5.87	63	1.94	0.84	0.84
A3	5.4	11	64	5.38	67	2.21	0.86	0.86
A4	5.3	15	56	5.67	59	1.88	0.84	0.84
A5	5.3	11	76	6.47	79	2.18	0.86	0.86
A6	5.3	14	70	6.60	73	1.94	0.84	0.84
A7	5.4	14	83	7.89	87	1.97	0.84	0.85

Subarea	Modeled (25-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	6.7	8	112	9.21	116	3.19	0.90	0.90
A2	6.5	12	83	8.46	86	2.57	0.88	0.88
A3	6.6	9	90	7.80	93	2.98	0.90	0.90
A4	6.5	13	77	8.16	80	2.47	0.88	0.88
A5	6.5	10	101	9.31	104	2.80	0.89	0.89
A6	6.5	12	96	9.57	100	2.57	0.88	0.88
A7	6.6	12	114	11.45	118	2.60	0.88	0.88

Subarea	Modeled (50-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	7.6	8	128	11.48	132	3.64	0.90	0.90
A2	7.4	11	101	10.54	104	3.05	0.90	0.90
A3	7.5	8	109	9.74	113	3.59	0.90	0.90
A4	7.4	12	93	10.17	96	2.93	0.89	0.89
A5	7.4	9	122	11.60	126	3.35	0.90	0.90
A6	7.4	10	122	11.98	126	3.19	0.90	0.90
A7	7.5	11	138	14.30	142	3.09	0.90	0.90

Subarea	Modeled (100-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	8.5	7	152	13.82	157	4.34	0.90	0.90
A2	8.3	10	118	12.69	122	3.58	0.90	0.90
A3	8.4	8	122	11.74	126	4.03	0.90	0.90
A4	8.3	11	109	12.25	112	3.42	0.90	0.90
A5	8.3	8	144	13.96	149	3.97	0.90	0.90
A6	8.3	10	137	14.46	141	3.58	0.90	0.90
A7	8.4	10	162	17.25	167	3.62	0.90	0.90

Los Angeles County HydroCalc Calculator Version 1.0.3

Summary of Output Data

Subarea	Modeled (2-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	2.9	17	28	2.22	31	0.99	0.73	0.74
A2	2.9	25	20	2.11	22	0.80	0.68	0.69
A3	2.9	18	23	1.88	25	0.95	0.72	0.72
A4	2.9	27	19	2.03	21	0.77	0.67	0.68
A5	2.9	20	26	2.33	28	0.89	0.71	0.71
A6	2.9	24	24	2.30	26	0.82	0.69	0.69
A7	2.9	25	28	2.75	30	0.81	0.68	0.69

Subarea	Modeled (5-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	4.4	12	57	4.45	60	1.75	0.83	0.83
A2	4.3	17	43	4.15	45	1.45	0.80	0.80
A3	4.4	13	46	3.77	49	1.67	0.82	0.82
A4	4.3	18	40	4.00	42	1.41	0.80	0.80
A5	4.3	13	55	4.58	58	1.65	0.82	0.82
A6	4.3	16	51	4.63	54	1.49	0.81	0.81
A7	4.4	17	59	5.53	62	1.47	0.80	0.81

Subarea	Modeled (10-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	5.4	10	79	6.36	82	2.34	0.87	0.87
A2	5.3	14	60	5.87	63	1.94	0.84	0.84
A3	5.4	11	64	5.38	67	2.21	0.86	0.86
A4	5.3	15	56	5.67	59	1.88	0.84	0.84
A5	5.3	11	76	6.47	79	2.18	0.86	0.86
A6	5.3	14	70	6.60	73	1.94	0.84	0.84
A7	5.4	14	83	7.89	87	1.97	0.84	0.85

Subarea	Modeled (25-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	6.7	8	112	9.21	116	3.19	0.90	0.90
A2	6.5	12	83	8.46	86	2.57	0.88	0.88
A3	6.6	9	90	7.80	93	2.98	0.90	0.90
A4	6.5	13	77	8.16	80	2.47	0.88	0.88
A5	6.5	10	101	9.31	104	2.80	0.89	0.89
A6	6.5	12	96	9.57	100	2.57	0.88	0.88
A7	6.6	12	114	11.45	118	2.60	0.88	0.88

Subarea	Modeled (50-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	7.6	8	128	11.48	132	3.64	0.90	0.90
A2	7.4	11	101	10.54	104	3.05	0.90	0.90
A3	7.5	8	109	9.74	113	3.59	0.90	0.90
A4	7.4	12	93	10.17	96	2.93	0.89	0.89
A5	7.4	9	122	11.60	126	3.35	0.90	0.90
A6	7.4	10	122	11.98	126	3.19	0.90	0.90
A7	7.5	11	138	14.30	142	3.09	0.90	0.90

Subarea	Modeled (100-yr) Rainfall Depth (in)	Tc, (min)	Clear Peak Flow Rate (cfs)	24-Hr Clear Runoff Volume (ac-ft)	Burned Peak Flow Rate (cfs)	Peak Intensity (in/hr)	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	8.5	7	152	13.82	157	4.34	0.90	0.90
A2	8.3	10	118	12.69	122	3.58	0.90	0.90
A3	8.4	8	122	11.74	126	4.03	0.90	0.90
A4	8.3	11	109	12.25	112	3.42	0.90	0.90
A5	8.3	8	144	13.96	149	3.97	0.90	0.90
A6	8.3	10	137	14.46	141	3.58	0.90	0.90
A7	8.4	10	162	17.25	167	3.62	0.90	0.90

SUMMARY OF HYDROGRAPGH FOR PEAK FLOWS AT CONFLUENCE NODES

- CONFLUENCE IS MADE USING RATIONAL METHOD
- STORAGE ROUTING IS NOT CONSIDERED

2 YEAR - 24 HOUR HYDROGRAPGH FOR PEAK FLOWS AT CONFLUENCE NODES

CONFLUENCE AT NODE 15	72	cfs
CONFLUENCE AT NODE 21 WEST	140	cfs
CONFLUENCE AT NODE 21 NORTH	28	cfs

5 YEAR - 24 HOUR HYDROGRAPGH FOR PEAK FLOWS AT CONFLUENCE NODES

CONFLUENCE AT NODE 15	146	cfs
CONFLUENCE AT NODE 21 WEST	292	cfs
CONFLUENCE AT NODE 21 NORTH	59	cfs

10 YEAR - 24 HOUR HYDROGRAPGH FOR PEAK FLOWS AT CONFLUENCE NODES

CONFLUENCE AT NODE 15	204	cfs
CONFLUENCE AT NODE 21 WEST	405	cfs
CONFLUENCE AT NODE 21 NORTH	83	cfs

25 YEAR - 24 HOUR HYDROGRAPGH FOR PEAK FLOWS AT CONFLUENCE NODES

CONFLUENCE AT NODE 15	285	cfs
CONFLUENCE AT NODE 21 WEST	558	cfs
CONFLUENCE AT NODE 21 NORTH	114	cfs

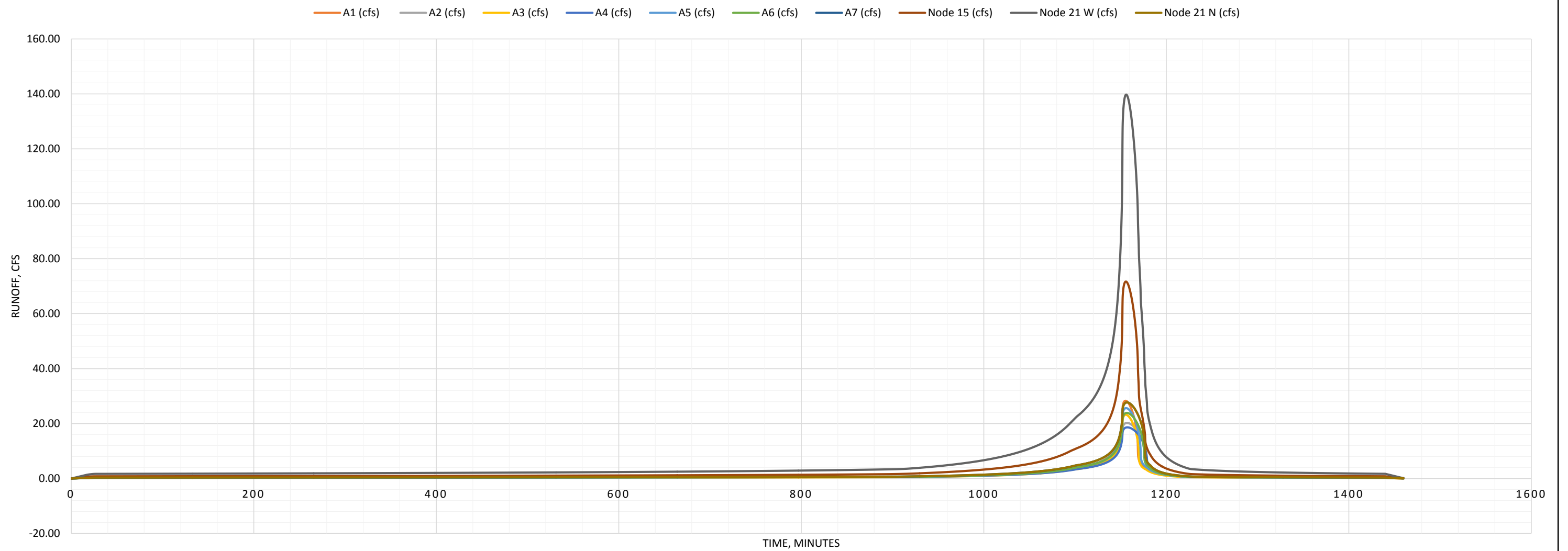
50 YEAR - 24 HOUR HYDROGRAPGH FOR PEAK FLOWS AT CONFLUENCE NODES

CONFLUENCE AT NODE 15	337	cfs
CONFLUENCE AT NODE 21 WEST	673	cfs
CONFLUENCE AT NODE 21 NORTH	138	cfs

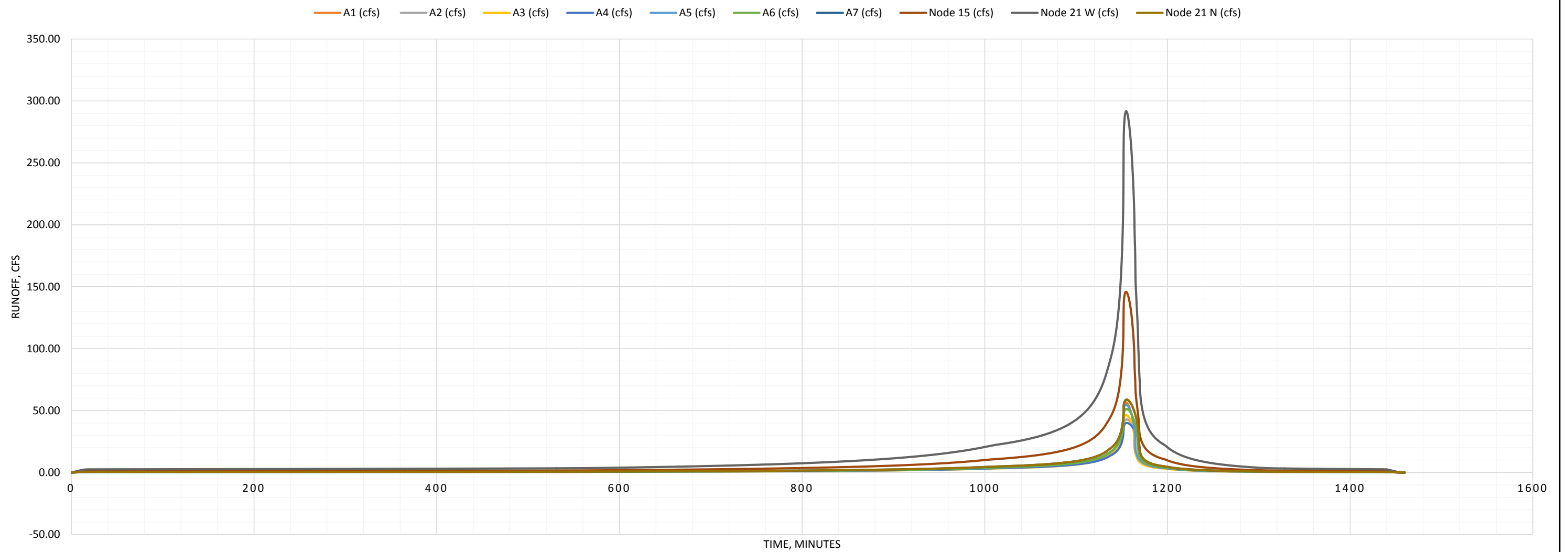
100 YEAR - 24 HOUR HYDROGRAPGH FOR PEAK FLOWS AT CONFLUENCE NODES

CONFLUENCE AT NODE 15	393	cfs
CONFLUENCE AT NODE 21 WEST	783	cfs
CONFLUENCE AT NODE 21 NORTH	162	cfs

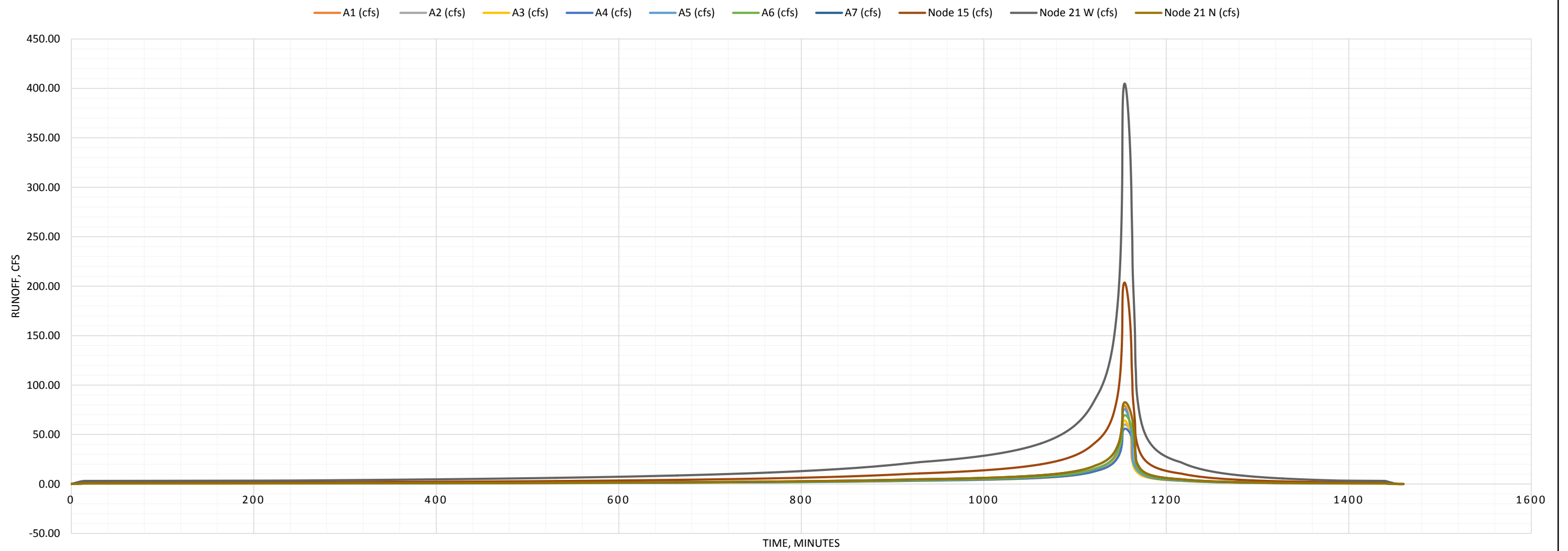
2 YEAR - 24 HOUR CONFLUENCE AT NODES



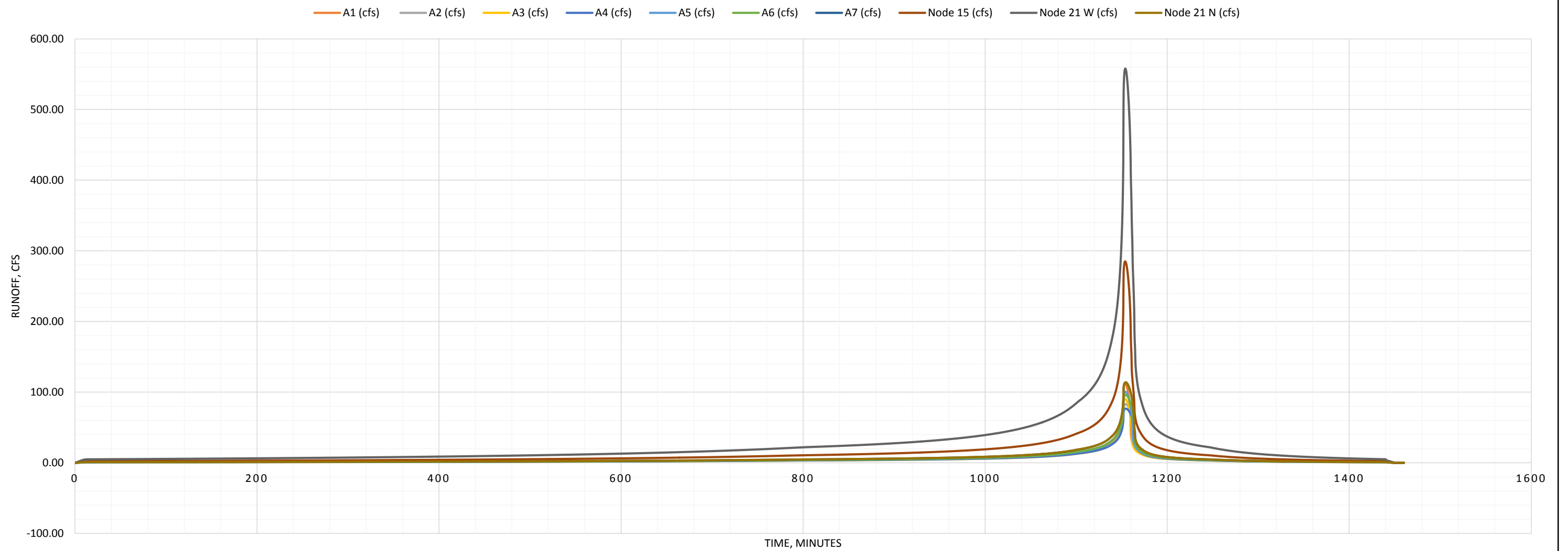
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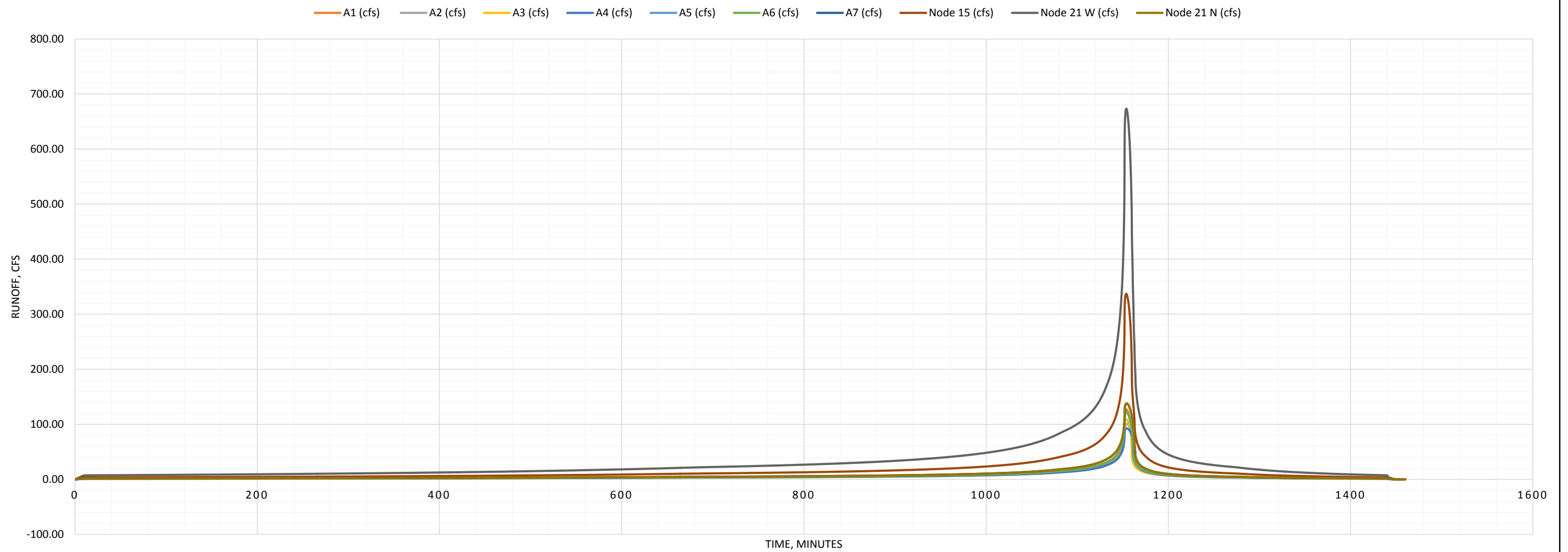
10 YEAR - 24 HOUR CONFLUENCE AT NODES



25 YEAR - 24 HOUR CONFLUENCE AT NODES

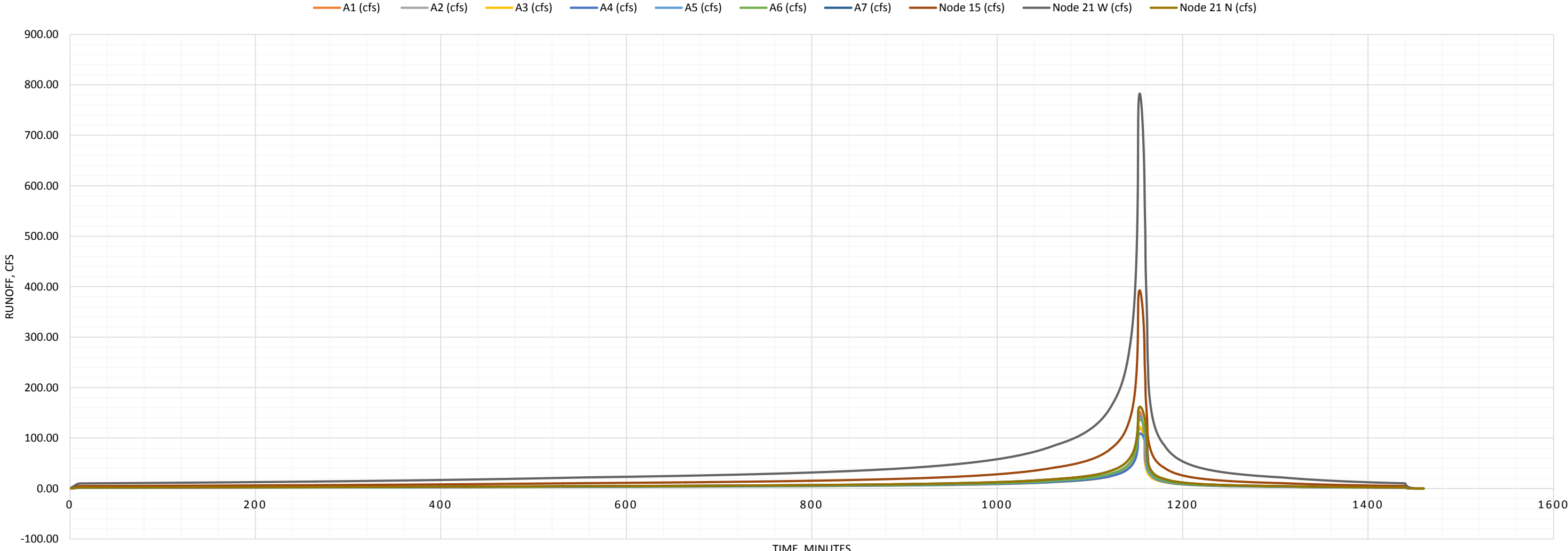


50 YEAR - 24 HOUR CONFLUENCE AT NODES



HYDROGRAPH

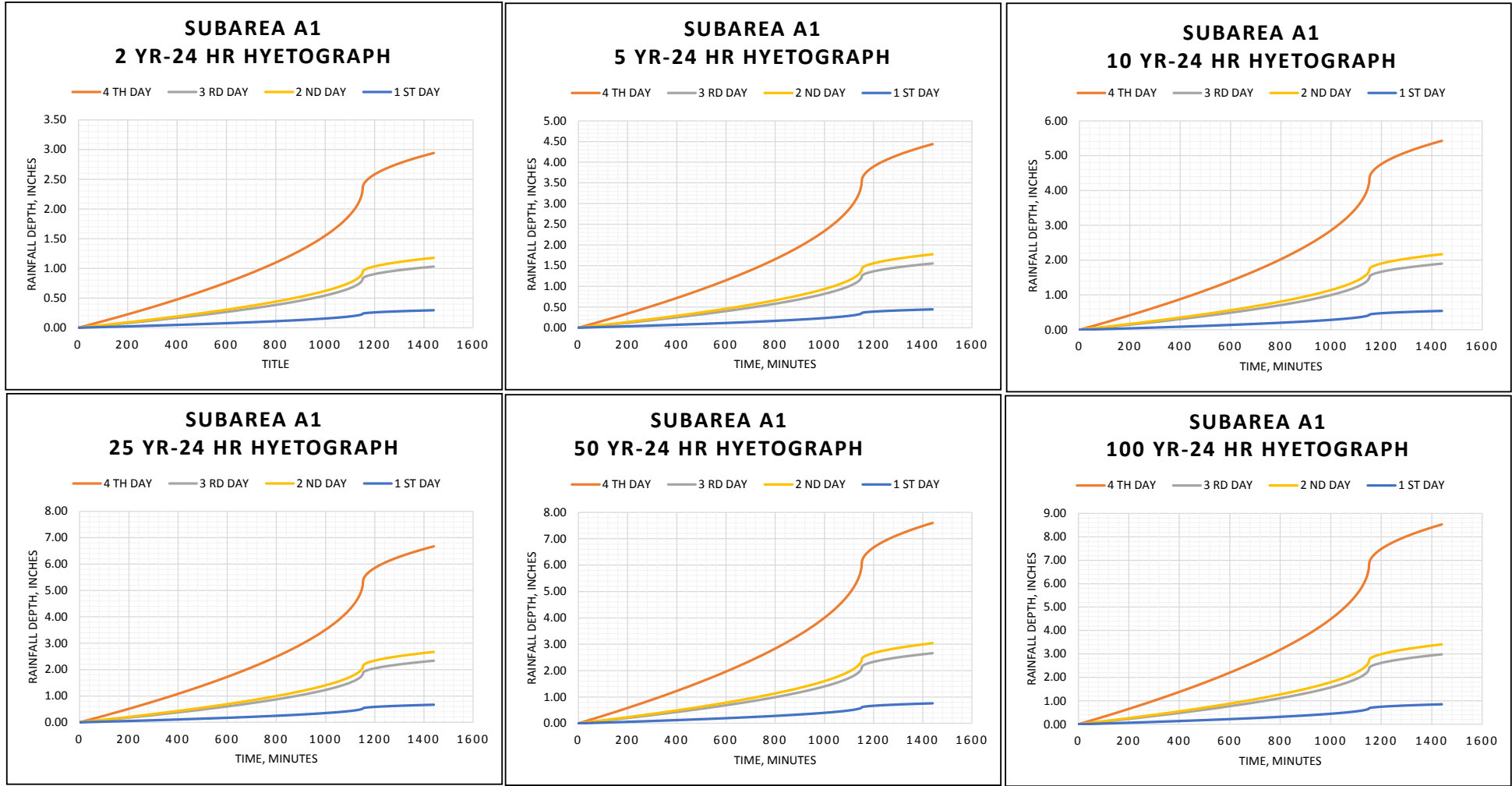
100 YEAR - 24 HOUR CONFLUENCE AT NODES



SUBAREA A1 HYETOGRAPHS

- Per 2006 Los Angeles County Hydrology Manual Appendix A

24 HR ISOHYETS,IN					
50 YR	2 YR	5 YR	10 YR	25 YR	100 YR
7.6	2.9	4.4	5.4	6.7	8.5



UNIT HYETOGRAPH		50 YR - 24 HR					2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
30	0.01	0.08	0.03	0.03	0.01	0.03	0.01	0.01	0.00	0.05	0.02	0.02	0.00	0.06	0.02	0.02	0.01	0.07	0.03	0.03	0.01	0.09	0.03	0.04	0.01	
60	0.02	0.17	0.06	0.07	0.02	0.07	0.02	0.03	0.01	0.10	0.03	0.04	0.01	0.12	0.04	0.05	0.01	0.15	0.05	0.06	0.01	0.19	0.07	0.08	0.02	
90	0.03	0.26	0.09	0.10	0.03	0.10	0.03	0.04	0.01	0.15	0.05	0.06	0.01	0.18	0.06	0.07	0.02	0.23	0.08	0.09	0.02	0.29	0.10	0.12	0.03	
120	0.05	0.34	0.12	0.14	0.03	0.13	0.05	0.05	0.01	0.20	0.07	0.08	0.02	0.25	0.09	0.10	0.02	0.30	0.11	0.12	0.03	0.39	0.14	0.15	0.04	
150	0.06	0.43	0.15	0.17	0.04	0.17	0.06	0.07	0.02	0.25	0.09	0.10	0.03	0.31	0.11	0.12	0.03	0.38	0.13	0.15	0.04	0.49	0.17	0.19	0.05	
180	0.07	0.52	0.18	0.21	0.05	0.20	0.07	0.08	0.02	0.31	0.11	0.12	0.03	0.37	0.13	0.15	0.04	0.46	0.16	0.18	0.05	0.59	0.21	0.23	0.06	
210	0.08	0.62	0.22	0.25	0.06	0.24	0.08	0.10	0.02	0.36	0.13	0.14	0.04	0.44	0.15	0.18	0.04	0.54	0.19	0.22	0.05	0.69	0.24	0.28	0.07	
240	0.09	0.71	0.25	0.28	0.07	0.27	0.10	0.11	0.03	0.41	0.14	0.17	0.04	0.51	0.18	0.20	0.05	0.62	0.22	0.25	0.06	0.79	0.28	0.32	0.08	
270	0.11	0.80	0.28	0.32	0.08	0.31	0.11	0.12	0.03	0.47	0.16	0.19	0.05	0.57	0.20	0.23	0.06	0.70	0.25	0.28	0.07	0.90	0.32	0.36	0.09	
300	0.12	0.90	0.31	0.36	0.09	0.35	0.12	0.14	0.03	0.52	0.18	0.21	0.05	0.64	0.22	0.26	0.06	0.79	0.28	0.32	0.08	1.01	0.35	0.40	0.10	
330	0.13	1.00	0.35	0.40	0.10	0.39	0.13	0.15	0.04	0.58	0.20	0.23	0.06	0.71	0.25	0.28	0.07	0.87	0.31	0.35	0.09	1.12	0.39	0.45	0.11	
360	0.14	1.10	0.38	0.44	0.11	0.42	0.15	0.17	0.04	0.64	0.22	0.26	0.06	0.78	0.27	0.31	0.08	0.96	0.34	0.38	0.10	1.23	0.43	0.49	0.12	
390	0.16	1.20	0.42	0.48	0.12	0.46	0.16	0.19	0.05	0.70	0.24	0.28	0.07	0.85	0.30	0.34	0.09	1.05	0.37	0.42	0.11	1.34	0.47	0.54	0.13	
420	0.17	1.30	0.45	0.52	0.13	0.50	0.18	0.20	0.05	0.76	0.27	0.30	0.08	0.93	0.32	0.37	0.09	1.14	0.40	0.46	0.11	1.46	0.51	0.58	0.15	
450	0.18	1.40	0.49	0.56	0.14	0.54	0.19	0.22	0.05	0.82	0.29	0.33	0.08	1.00	0.35	0.40	0.10	1.23	0.43	0.49	0.12	1.58	0.55	0.63	0.16	
480	0.20	1.51	0.53	0.60	0.15	0.58	0.20	0.23	0.06	0.88	0.31	0.35	0.09	1.08	0.38	0.43	0.11	1.33	0.46	0.53	0.13	1.70	0.59	0.68	0.17	
510	0.21	1.62	0.57	0.65	0.16	0.63	0.22	0.25	0.06	0.95	0.33	0.38	0.09	1.16	0.40	0.46	0.12	1.42	0.50	0.57	0.14	1.82	0.64	0.73	0.18	

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
540	0.23	1.73	0.61	0.69	0.17	0.67	0.23	0.27	0.07	1.01	0.35	0.40	0.10	1.24	0.43	0.49	0.12	1.52	0.53	0.61	0.15	1.94	0.68	0.78	0.19
570	0.24	1.85	0.65	0.74	0.18	0.71	0.25	0.29	0.07	1.08	0.38	0.43	0.11	1.32	0.46	0.53	0.13	1.62	0.57	0.65	0.16	2.07	0.72	0.83	0.21
600	0.26	1.96	0.69	0.79	0.20	0.76	0.27	0.30	0.08	1.15	0.40	0.46	0.11	1.40	0.49	0.56	0.14	1.72	0.60	0.69	0.17	2.20	0.77	0.88	0.22
630	0.27	2.08	0.73	0.83	0.21	0.81	0.28	0.32	0.08	1.22	0.43	0.49	0.12	1.49	0.52	0.59	0.15	1.83	0.64	0.73	0.18	2.34	0.82	0.93	0.23
660	0.29	2.21	0.77	0.88	0.22	0.85	0.30	0.34	0.09	1.29	0.45	0.52	0.13	1.58	0.55	0.63	0.16	1.94	0.68	0.78	0.19	2.48	0.87	0.99	0.25
690	0.31	2.33	0.82	0.93	0.23	0.90	0.32	0.36	0.09	1.36	0.48	0.55	0.14	1.67	0.58	0.67	0.17	2.05	0.72	0.82	0.20	2.62	0.92	1.05	0.26
720	0.32	2.46	0.86	0.99	0.25	0.95	0.33	0.38	0.10	1.44	0.50	0.58	0.14	1.76	0.62	0.70	0.18	2.16	0.76	0.87	0.22	2.77	0.97	1.11	0.28
750	0.34	2.60	0.91	1.04	0.26	1.01	0.35	0.40	0.10	1.52	0.53	0.61	0.15	1.86	0.65	0.74	0.19	2.28	0.80	0.91	0.23	2.92	1.02	1.17	0.29
780	0.36	2.74	0.96	1.10	0.27	1.06	0.37	0.42	0.11	1.60	0.56	0.64	0.16	1.96	0.68	0.78	0.20	2.41	0.84	0.96	0.24	3.07	1.08	1.23	0.31
810	0.38	2.89	1.01	1.15	0.29	1.12	0.39	0.45	0.11	1.69	0.59	0.67	0.17	2.06	0.72	0.82	0.21	2.53	0.89	1.01	0.25	3.24	1.13	1.30	0.32
840	0.40	3.04	1.06	1.21	0.30	1.18	0.41	0.47	0.12	1.77	0.62	0.71	0.18	2.17	0.76	0.87	0.22	2.67	0.93	1.07	0.27	3.41	1.19	1.36	0.34
870	0.42	3.20	1.12	1.28	0.32	1.24	0.43	0.49	0.12	1.87	0.65	0.75	0.19	2.28	0.80	0.91	0.23	2.81	0.98	1.12	0.28	3.59	1.26	1.43	0.36
900	0.44	3.36	1.18	1.35	0.34	1.30	0.46	0.52	0.13	1.96	0.69	0.79	0.20	2.40	0.84	0.96	0.24	2.95	1.03	1.18	0.30	3.77	1.32	1.51	0.38
930	0.47	3.54	1.24	1.42	0.35	1.37	0.48	0.55	0.14	2.07	0.72	0.83	0.21	2.53	0.88	1.01	0.25	3.11	1.09	1.24	0.31	3.97	1.39	1.59	0.40
960	0.49	3.73	1.30	1.49	0.37	1.44	0.50	0.58	0.14	2.18	0.76	0.87	0.22	2.66	0.93	1.06	0.27	3.27	1.15	1.31	0.33	4.18	1.46	1.67	0.42
970	0.50	3.79	1.33	1.52	0.38	1.47	0.51	0.59	0.15	2.22	0.78	0.89	0.22	2.71	0.95	1.08	0.27	3.33	1.17	1.33	0.33	4.26	1.49	1.70	0.43
980	0.51	3.86	1.35	1.54	0.39	1.49	0.52	0.60	0.15	2.25	0.79	0.90	0.23	2.76	0.96	1.10	0.28	3.39	1.19	1.36	0.34	4.33	1.52	1.73	0.43
990	0.52	3.93	1.38	1.57	0.39	1.52	0.53	0.61	0.15	2.30	0.80	0.92	0.23	2.81	0.98	1.12	0.28	3.45	1.21	1.38	0.35	4.41	1.54	1.76	0.44
1000	0.53	4.00	1.40	1.60	0.40	1.55	0.54	0.62	0.15	2.34	0.82	0.93	0.23	2.86	1.00	1.14	0.29	3.51	1.23	1.41	0.35	4.49	1.57	1.80	0.45
1010	0.54	4.08	1.43	1.63	0.41	1.58	0.55	0.63	0.16	2.38	0.83	0.95	0.24	2.91	1.02	1.16	0.29	3.58	1.25	1.43	0.36	4.57	1.60	1.83	0.46
1020	0.55	4.15	1.45	1.66	0.42	1.61	0.56	0.64	0.16	2.42	0.85	0.97	0.24	2.96	1.04	1.19	0.30	3.64	1.28	1.46	0.36	4.66	1.63	1.86	0.47
1030	0.56	4.23	1.48	1.69	0.42	1.64	0.57	0.65	0.16	2.47	0.86	0.99	0.25	3.02	1.06	1.21	0.30	3.71	1.30	1.49	0.37	4.75	1.66	1.90	0.47
1040	0.57	4.31	1.51	1.72	0.43	1.67	0.58	0.67	0.17	2.52	0.88	1.01	0.25	3.08	1.08	1.23	0.31	3.79	1.33	1.51	0.38	4.84	1.69	1.94	0.48
1050	0.58	4.40	1.54	1.76	0.44	1.70	0.60	0.68	0.17	2.57	0.90	1.03	0.26	3.14	1.10	1.26	0.31	3.86	1.35	1.54	0.39	4.93	1.73	1.97	0.49
1060	0.59	4.49	1.57	1.79	0.45	1.74	0.61	0.69	0.17	2.62	0.92	1.05	0.26	3.20	1.12	1.28	0.32	3.94	1.38	1.58	0.39	5.03	1.76	2.01	0.50
1070	0.60	4.58	1.60	1.83	0.46	1.77	0.62	0.71	0.18	2.68	0.94	1.07	0.27	3.27	1.14	1.31	0.33	4.02	1.41	1.61	0.40	5.14	1.80	2.06	0.51
1080	0.62	4.68	1.64	1.87	0.47	1.81	0.63	0.72	0.18	2.73	0.96	1.09	0.27	3.34	1.17	1.34	0.33	4.11	1.44	1.64	0.41	5.25	1.84	2.10	0.53
1090	0.63	4.79	1.68	1.92	0.48	1.85	0.65	0.74	0.19	2.80	0.98	1.12	0.28	3.42	1.20	1.37	0.34	4.20	1.47	1.68	0.42	5.37	1.88	2.15	0.54
1100	0.65	4.90	1.72	1.96	0.49	1.90	0.66	0.76	0.19	2.86	1.00	1.15	0.29	3.50	1.23	1.40	0.35	4.30	1.51	1.72	0.43	5.50	1.93	2.20	0.55
1110	0.66	5.03	1.76	2.01	0.50	1.95	0.68	0.78	0.19	2.94	1.03	1.17	0.29	3.59	1.26	1.44	0.36	4.42	1.55	1.77	0.44	5.64	1.97	2.26	0.56
1115	0.67	5.10	1.78	2.04	0.51	1.97	0.69	0.79	0.20	2.98	1.04	1.19	0.30	3.64	1.27	1.46	0.36	4.48	1.57	1.79	0.45	5.72	2.00	2.29	0.57
1120	0.68	5.17	1.81	2.07	0.52	2.00	0.70	0.80	0.20	3.02	1.06	1.21	0.30	3.69	1.29	1.48	0.37	4.54	1.59	1.82	0.45	5.80	2.03	2.32	0.58
1125	0.69	5.25	1.84	2.10	0.52	2.03	0.71	0.81	0.20	3.07	1.07	1.23	0.31	3.75	1.31	1.50	0.37	4.61	1.61	1.84	0.46	5.89	2.06	2.36	0.59
1130	0.70	5.33	1.87	2.13	0.53	2.06	0.72	0.83	0.21	3.11	1.09	1.25	0.31	3.81	1.33	1.52	0.38	4.68	1.64	1.87	0.47	5.98	2.09	2.39	0.60
1135	0.71	5.43	1.90	2.17	0.54	2.10	0.74	0.84	0.21	3.17	1.11	1.27	0.32	3.88	1.36	1.55	0.39	4.77	1.67	1.91	0.48	6.09	2.13	2.44	0.61
1136	0.72	5.45	1.91	2.18	0.54	2.11	0.74	0.84	0.21	3.18	1.11	1.27	0.32	3.89	1.36	1.56	0.39	4.78	1.67	1.91	0.48	6.11	2.14	2.45	0.61
1137	0.72	5.47	1.91	2.19	0.55	2.12	0.74	0.85	0.21	3.20	1.12	1.28	0.32	3.91	1.37	1.56	0.39	4.80	1.68	1.92	0.48	6.14	2.15	2.46	0.61
1138	0.72	5.49	1.92	2.20	0.55	2.13	0.74	0.85	0.21	3.21	1.12	1.28	0.32	3.92	1.37	1.57	0.39	4.82	1.69	1.93	0.48	6.16	2.16	2.47	0.62
1139	0.73	5.52	1.93	2.21	0.55	2.13	0.75	0.85	0.21	3.22	1.13	1.29	0.32	3.94	1.38	1.58	0.39	4.84	1.69	1.94	0.48	6.19	2.17	2.48	0.62
1140	0.73	5.54	1.94	2.22	0.55	2.14	0.75	0.86	0.21	3.23	1.13	1.29	0.32	3.95	1.38	1.58	0.40	4.86	1.70	1.95	0.49	6.21	2.18	2.49	0.62
1145	0.75	5.67	1.99	2.27	0.57	2.20	0.77	0.88	0.22	3.31	1.16	1.33	0.33	4.05	1.42	1.62	0.41	4.98	1.74	1.99	0.50	6.37	2.23	2.55	0.64
1150	0.77	5.87	2.05	2.35	0.59	2.27	0.80	0.91	0.23	3.43	1.20	1.37	0.34	4.19	1.47	1.68	0.42	5.15	1.80	2.06	0.52	6.59	2.31	2.63	0.66
1151	0.78	5.94	2.08	2.37	0.59	2.30	0.80	0.92	0.23	3.47	1.21	1.39	0.35	4.24	1.48	1.70	0.42	5.21	1.82	2.08	0.52	6.66	2.33	2.66	0.67
1152	0.80	6.08	2.13	2.43	0.61	2.35	0.82	0.94	0.24	3.55	1.24	1.42	0.36	4.34	1.52	1.74	0.43	5.34	1.87	2.14	0.53	6.82	2.39	2.73	0.68
1153	0.81	6.16	2.15	2.46	0.62	2.38	0.83	0.95	0.24	3.59	1.26	1.44	0.36	4.40	1.54	1.76	0.44	5.40	1.89	2.16	0.54	6.91	2.42	2.76	0.69
1154	0.81	6.19	2.17	2.48	0.62	2.40	0.84	0.96	0.24	3.61	1.27	1.45	0.36	4.42	1.55	1.77	0.44	5.43	1.90	2.17	0.54	6.94	2.43	2.78	0.69
1155	0.82	6.22	2.18	2.49	0.62	2.41	0.84	0.96	0.24	3.63	1.27	1.45	0.36	4.44	1.55	1.78	0.44	5.46	1.91	2.18	0.55	6.97	2.44	2.79	0.70
1156	0.82	6.24	2.18	2.50	0.62	2.41	0.84	0.97	0.24	3.64	1.27	1.46	0.36	4.45	1.56	1.78	0.45	5.48	1.92	2.19	0.55	7.00	2.45	2.80	0.70
1157	0.82	6.26	2.19	2.50	0.63	2.42	0.85	0.97	0.24	3.65	1.28	1.46	0.37	4.47	1.56	1.79	0.45	5.49	1.92	2.20	0.55	7.02	2.46	2.81	0.70
1158	0.83	6.28																							

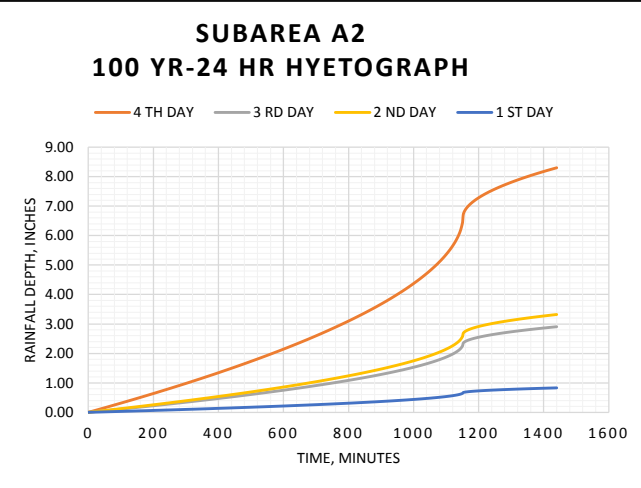
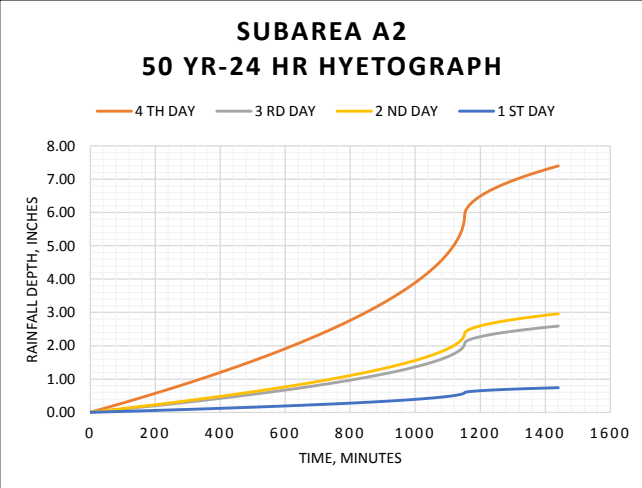
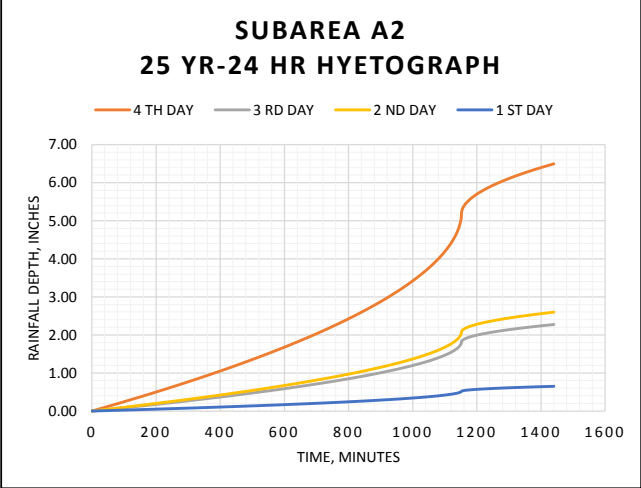
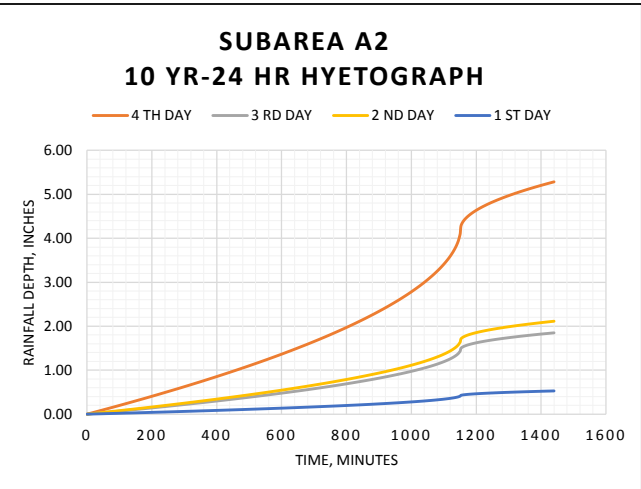
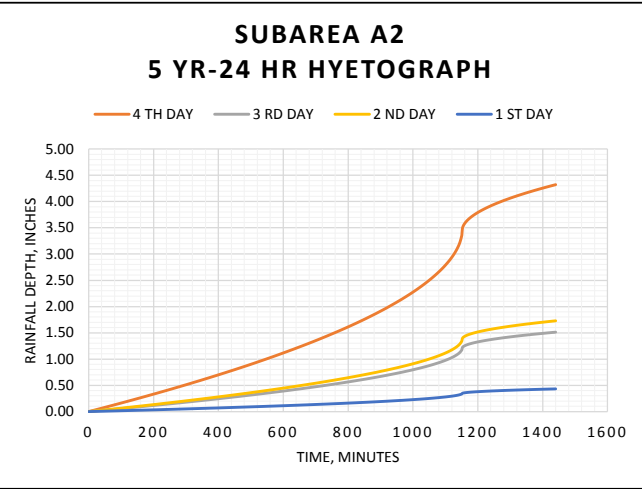
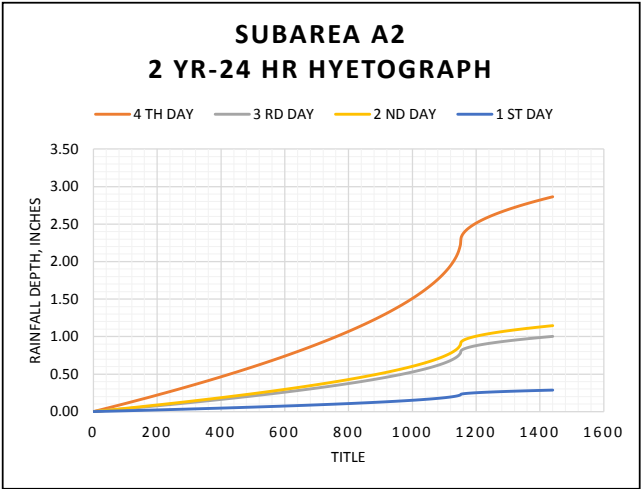
UNIT HYETOGRAPH	50 YR - 24 HR					2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1174	0.85	6.47	2.26	2.59	0.65	2.50	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.90	0.73
1175	0.85	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.27	2.54	2.91	0.73
1176	0.85	6.49	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.52	0.38	4.63	1.62	1.85	0.46	5.70	1.99	2.28	0.57	7.28	2.55	2.91	0.73
1177	0.85	6.50	2.27	2.60	0.65	2.51	0.88	1.01	0.25	3.79	1.33	1.52	0.38	4.64	1.62	1.86	0.46	5.70	2.00	2.28	0.57	7.29	2.55	2.92	0.73
1178	0.86	6.50	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.63	1.86	0.46	5.71	2.00	2.28	0.57	7.30	2.55	2.92	0.73
1179	0.86	6.51	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.65	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.31	2.56	2.92	0.73
1180	0.86	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.73	2.00	2.29	0.57	7.32	2.56	2.93	0.73
1181	0.86	6.53	2.29	2.61	0.65	2.53	0.88	1.01	0.25	3.81	1.33	1.53	0.38	4.66	1.63	1.87	0.47	5.73	2.01	2.29	0.57	7.33	2.56	2.93	0.73
1182	0.86	6.54	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.34	2.57	2.93	0.73
1183	0.86	6.55	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.64	1.87	0.47	5.75	2.01	2.30	0.57	7.35	2.57	2.94	0.73
1184	0.86	6.55	2.29	2.62	0.66	2.54	0.89	1.01	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.75	2.01	2.30	0.58	7.35	2.57	2.94	0.74
1185	0.86	6.56	2.30	2.62	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.69	1.64	1.87	0.47	5.76	2.02	2.30	0.58	7.36	2.58	2.95	0.74
1186	0.86	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.53	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.37	2.58	2.95	0.74
1187	0.87	6.58	2.30	2.63	0.66	2.55	0.89	1.02	0.25	3.84	1.34	1.54	0.38	4.70	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.38	2.58	2.95	0.74
1188	0.87	6.58	2.30	2.63	0.66	2.55	0.89	1.02	0.25	3.85	1.35	1.54	0.38	4.70	1.65	1.88	0.47	5.78	2.02	2.31	0.58	7.39	2.59	2.96	0.74
1189	0.87	6.59	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.38	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1190	0.87	6.60	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.39	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1191	0.87	6.61	2.31	2.64	0.66	2.56	0.89	1.02	0.26	3.86	1.35	1.54	0.39	4.72	1.65	1.89	0.47	5.80	2.03	2.32	0.58	7.41	2.59	2.97	0.74
1192	0.87	6.61	2.31	2.65	0.66	2.56	0.90	1.02	0.26	3.86	1.35	1.55	0.39	4.72	1.65	1.89	0.47	5.81	2.03	2.32	0.58	7.42	2.60	2.97	0.74
1193	0.87	6.62	2.32	2.65	0.66	2.56	0.90	1.02	0.26	3.87	1.35	1.55	0.39	4.73	1.65	1.89	0.47	5.81	2.03	2.33	0.58	7.43	2.60	2.97	0.74
1194	0.87	6.63	2.32	2.65	0.66	2.56	0.90	1.03	0.26	3.87	1.35	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.44	2.60	2.97	0.74
1195	0.87	6.63	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.74	1.66	1.89	0.47	5.83	2.04	2.33	0.58	7.44	2.61	2.98	0.74
1196	0.87	6.64	2.32	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.75
1197	0.87	6.65	2.33	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.75	1.66	1.90	0.47	5.84	2.04	2.33	0.58	7.46	2.61	2.98	0.75
1198	0.88	6.65	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.55	0.39	4.75	1.66	1.90	0.48	5.84	2.05	2.34	0.58	7.47	2.61	2.99	0.75
1199	0.88	6.66	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.76	1.66	1.90	0.48	5.85	2.05	2.34	0.58	7.47	2.62	2.99	0.75
1200	0.88	6.67	2.33	2.67	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.76	1.67	1.90	0.48	5.85	2.05	2.34	0.59	7.48	2.62	2.99	0.75
1201	0.88	6.67	2.34	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.77	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.49	2.62	3.00	0.75
1202	0.88	6.68	2.34	2.67	0.67	2.59	0.90	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.62	3.00	0.75
1203	0.88	6.69	2.34	2.67	0.67	2.59	0.91	1.04	0.26	3.91	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.63	3.00	0.75
1204	0.88	6.69	2.34	2.68	0.67	2.59	0.91	1.04	0.26	3.91	1.37	1.56	0.39	4.78	1.67	1.91	0.48	5.88	2.06	2.35	0.59	7.51	2.63	3.00	0.75
1205	0.88	6.70	2.34	2.68	0.67	2.59	0.91	1.04	0.26	3.91	1.37	1.57	0.39	4.78	1.67	1.91	0.48	5.88	2.06	2.35	0.59	7.52	2.63	3.01	0.75
1206	0.88	6.71	2.35	2.68	0.67	2.60	0.91	1.04	0.26	3.92	1.37	1.57	0.39	4.79	1.68	1.92	0.48	5.89	2.06	2.36	0.59	7.52	2.63	3.01	0.75
1207	0.88	6.71	2.35	2.68	0.67	2.60	0.91	1.04	0.26	3.92	1.37	1.57	0.39	4.79	1.68	1.92	0.48	5.89	2.06	2.36	0.59	7.53	2.64	3.01	0.75
1208	0.88	6.72	2.35	2.69	0.67	2.60	0.91	1.04	0.26	3.92	1.37	1.57	0.39	4.80	1.68	1.92	0.48	5.90	2.06	2.36	0.59	7.54	2.64	3.02	0.75
1209	0.88	6.72	2.35	2.69	0.67	2.60	0.91	1.04	0.26	3.93	1.37	1.57	0.39	4.80	1.68	1.92	0.48	5.90	2.07	2.36	0.59	7.54	2.64	3.02	0.75
1210	0.89	6.73	2.36	2.69	0.67	2.60	0.91	1.04	0.26	3.93	1.38	1.57	0.39	4.81	1.68	1.92	0.48	5.91	2.07	2.36	0.59	7.55	2.64	3.02	0.76
1211	0.89	6.74	2.36	2.69	0.67	2.61	0.91	1.04	0.26	3.93	1.38	1.57	0.39	4.81	1.68	1.92	0.48	5.91	2.07	2.37	0.59	7.56	2.65	3.02	0.76
1212	0.89	6.74	2.36	2.70	0.67	2.61	0.91	1.04	0.26	3.94	1.38	1.57	0.39	4.81	1.68	1.93	0.48	5.92	2.07	2.37	0.59	7.56	2.65	3.03	0.76
1213	0.89	6.75	2.36	2.70	0.67	2.61	0.91	1.04	0.26	3.94	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.92	2.07	2.37	0.59	7.57	2.65	3.03	0.76
1214	0.89	6.75	2.36	2.70	0.68	2.61	0.91	1.05	0.26	3.94	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.08	2.37	0.59	7.58	2.65	3.03	0.76
1215	0.89	6.76	2.37	2.70	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.83	1.69	1.93	0.48	5.93	2.08	2.37	0.59	7.58	2.65	3.03	0.76
1216	0.89	6.76	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.40	4.83	1.69	1.93	0.48	5.94	2.08	2.38	0.59	7.59	2.66	3.04	0.76
1217	0.89	6.77	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.40	4.83	1.69	1.93	0.48	5.94	2.08	2.38	0.59	7.60	2.66	3.04	0.76
1218	0.89	6.78	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.96	1.39	1.58	0.40	4.84	1.69	1.94	0.48	5.95	2.08	2.38	0.59	7.60	2.66	3.04	0.76
1219	0.89	6.78	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.96	1.39	1.58	0.40	4.84	1.69	1.94	0.48	5.95	2.08	2.38	0.60	7.61	2.66	3.04	0.76
1220	0.89	6.79	2.38	2.71	0.68	2.63	0.92	1.05	0.26	3.96	1.39	1.59	0.40	4.85	1.70	1.94	0.48	5.96	2.09	2.38	0.60	7.62	2.67	3.05	0.76
1221	0.89	6.79	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.85	1.70	1.94	0.49	5.96	2.09	2.39	0.60	7.62	2.67	3.05	0.76
1222	0.89	6.80	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.85	1.70	1.94	0.49	5.97	2.09	2.39	0.60	7.63	2.67	3.05	0.76
1223	0.90	6.80	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.86	1.70	1.94	0.49	5.97	2.09	2.39	0.60	7.63	2.67	3.05	0.76

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1255	0.92	6.96	2.44	2.78	0.70	2.69	0.94	1.08	0.27	4.07	1.42	1.63	0.41	4.97	1.74	1.99	0.50	6.11	2.14	2.44	0.61	7.81	2.73	3.12	0.78
1260	0.92	6.98	2.44	2.79	0.70	2.70	0.95	1.08	0.27	4.08	1.43	1.63	0.41	4.99	1.75	1.99	0.50	6.13	2.15	2.45	0.61	7.84	2.74	3.13	0.78
1265	0.92	7.01	2.45	2.80	0.70	2.71	0.95	1.08	0.27	4.09	1.43	1.64	0.41	5.00	1.75	2.00	0.50	6.15	2.15	2.46	0.62	7.86	2.75	3.14	0.79
1270	0.92	7.03	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.10	1.44	1.64	0.41	5.02	1.76	2.01	0.50	6.17	2.16	2.47	0.62	7.88	2.76	3.15	0.79
1275	0.93	7.05	2.47	2.82	0.70	2.73	0.95	1.09	0.27	4.12	1.44	1.65	0.41	5.03	1.76	2.01	0.50	6.19	2.17	2.48	0.62	7.91	2.77	3.16	0.79
1280	0.93	7.07	2.47	2.83	0.71	2.74	0.96	1.09	0.27	4.13	1.44	1.65	0.41	5.05	1.77	2.02	0.50	6.21	2.17	2.48	0.62	7.93	2.78	3.17	0.79
1285	0.93	7.09	2.48	2.84	0.71	2.74	0.96	1.10	0.27	4.14	1.45	1.66	0.41	5.06	1.77	2.02	0.51	6.22	2.18	2.49	0.62	7.95	2.78	3.18	0.80
1290	0.94	7.11	2.49	2.84	0.71	2.75	0.96	1.10	0.28	4.15	1.45	1.66	0.42	5.08	1.78	2.03	0.51	6.24	2.18	2.50	0.62	7.98	2.79	3.19	0.80
1295	0.94	7.13	2.50	2.85	0.71	2.76	0.97	1.10	0.28	4.16	1.46	1.67	0.42	5.09	1.78	2.04	0.51	6.26	2.19	2.50	0.63	8.00	2.80	3.20	0.80
1300	0.94	7.15	2.50	2.86	0.71	2.77	0.97	1.11	0.28	4.17	1.46	1.67	0.42	5.10	1.79	2.04	0.51	6.28	2.20	2.51	0.63	8.02	2.81	3.21	0.80
1305	0.94	7.17	2.51	2.87	0.72	2.77	0.97	1.11	0.28	4.19	1.46	1.67	0.42	5.12	1.79	2.05	0.51	6.29	2.20	2.52	0.63	8.04	2.81	3.22	0.80
1310	0.95	7.19	2.52	2.87	0.72	2.78	0.97	1.11	0.28	4.20	1.47	1.68	0.42	5.13	1.80	2.05	0.51	6.31	2.21	2.52	0.63	8.06	2.82	3.22	0.81
1315	0.95	7.20	2.52	2.88	0.72	2.79	0.98	1.12	0.28	4.21	1.47	1.68	0.42	5.14	1.80	2.06	0.51	6.33	2.21	2.53	0.63	8.08	2.83	3.23	0.81
1320	0.95	7.22	2.53	2.89	0.72	2.80	0.98	1.12	0.28	4.22	1.48	1.69	0.42	5.16	1.80	2.06	0.52	6.34	2.22	2.54	0.63	8.10	2.84	3.24	0.81
1325	0.95	7.24	2.53	2.90	0.72	2.80	0.98	1.12	0.28	4.23	1.48	1.69	0.42	5.17	1.81	2.07	0.52	6.36	2.22	2.54	0.64	8.12	2.84	3.25	0.81
1330	0.95	7.26	2.54	2.90	0.73	2.81	0.98	1.12	0.28	4.24	1.48	1.70	0.42	5.18	1.81	2.07	0.52	6.37	2.23	2.55	0.64	8.14	2.85	3.26	0.81
1335	0.96	7.28	2.55	2.91	0.73	2.82	0.99	1.13	0.28	4.25	1.49	1.70	0.42	5.19	1.82	2.08	0.52	6.39	2.24	2.56	0.64	8.16	2.86	3.27	0.82
1340	0.96	7.29	2.55	2.92	0.73	2.82	0.99	1.13	0.28	4.26	1.49	1.70	0.43	5.21	1.82	2.08	0.52	6.40	2.24	2.56	0.64	8.18	2.86	3.27	0.82
1345	0.96	7.31	2.56	2.92	0.73	2.83	0.99	1.13	0.28	4.27	1.49	1.71	0.43	5.22	1.83	2.09	0.52	6.42	2.25	2.57	0.64	8.20	2.87	3.28	0.82
1350	0.96	7.33	2.56	2.93	0.73	2.84	0.99	1.13	0.28	4.28	1.50	1.71	0.43	5.23	1.83	2.09	0.52	6.43	2.25	2.57	0.64	8.22	2.88	3.29	0.82
1355	0.97	7.34	2.57	2.94	0.73	2.84	0.99	1.14	0.28	4.29	1.50	1.72	0.43	5.24	1.83	2.10	0.52	6.45	2.26	2.58	0.64	8.24	2.88	3.30	0.82
1360	0.97	7.36	2.58	2.94	0.74	2.85	1.00	1.14	0.28	4.30	1.50	1.72	0.43	5.25	1.84	2.10	0.53	6.46	2.26	2.58	0.65	8.26	2.89	3.30	0.83
1365	0.97	7.38	2.58	2.95	0.74	2.85	1.00	1.14	0.29	4.31	1.51	1.72	0.43	5.27	1.84	2.11	0.53	6.48	2.27	2.59	0.65	8.28	2.90	3.31	0.83
1370	0.97	7.39	2.59	2.96	0.74	2.86	1.00	1.14	0.29	4.32	1.51	1.73	0.43	5.28	1.85	2.11	0.53	6.49	2.27	2.60	0.65	8.29	2.90	3.32	0.83
1375	0.97	7.41	2.59	2.96	0.74	2.87	1.00	1.15	0.29	4.33	1.51	1.73	0.43	5.29	1.85	2.12	0.53	6.50	2.28	2.60	0.65	8.31	2.91	3.32	0.83
1380	0.98	7.42	2.60	2.97	0.74	2.87	1.01	1.15	0.29	4.34	1.52	1.73	0.43	5.30	1.86	2.12	0.53	6.52	2.28	2.61	0.65	8.33	2.92	3.33	0.83
1385	0.98	7.44	2.60	2.98	0.74	2.88	1.01	1.15	0.29	4.34	1.52	1.74	0.43	5.31	1.86	2.12	0.53	6.53	2.29	2.61	0.65	8.35	2.92	3.34	0.83
1390	0.98	7.45	2.61	2.98	0.75	2.88	1.01	1.15	0.29	4.35	1.52	1.74	0.44	5.32	1.86	2.13	0.53	6.54	2.29	2.62	0.65	8.36	2.93	3.35	0.84
1395	0.98	7.47	2.61	2.99	0.75	2.89	1.01	1.16	0.29	4.36	1.53	1.74	0.44	5.33	1.87	2.13	0.53	6.56	2.30	2.62	0.66	8.38	2.93	3.35	0.84
1400	0.98	7.48	2.62	2.99	0.75	2.90	1.01	1.16	0.29	4.37	1.53	1.75	0.44	5.34	1.87	2.14	0.53	6.57	2.30	2.63	0.66	8.40	2.94	3.36	0.84
1405	0.99	7.50	2.62	3.00	0.75	2.90	1.02	1.16	0.29	4.38	1.53	1.75	0.44	5.35	1.87	2.14	0.54	6.58	2.30	2.63	0.66	8.41	2.94	3.37	0.84
1410	0.99	7.51	2.63	3.01	0.75	2.91	1.02	1.16	0.29	4.39	1.54	1.76	0.44	5.36	1.88	2.15	0.54	6.60	2.31	2.64	0.66	8.43	2.95	3.37	0.84
1415	0.99	7.53	2.64	3.01	0.75	2.91	1.02	1.17	0.29	4.40	1.54	1.76	0.44	5.38	1.88	2.15	0.54	6.61	2.31	2.64	0.66	8.45	2.96	3.38	0.84
1420	0.99	7.54	2.64	3.02	0.75	2.92	1.02	1.17	0.29	4.41	1.54	1.76	0.44	5.39	1.89	2.15	0.54	6.62	2.32	2.65	0.66	8.46	2.96	3.39	0.85
1425	0.99	7.56	2.65	3.02	0.76	2.92	1.02	1.17	0.29	4.41	1.54	1.77	0.44	5.40	1.89	2.16	0.54	6.64	2.32	2.65	0.66	8.48	2.97	3.39	0.85
1430	1.00	7.57	2.65	3.03	0.76	2.93	1.03	1.17	0.29	4.42	1.55	1.77	0.44	5.41	1.89	2.16	0.54	6.65	2.33	2.66	0.66	8.50	2.97	3.40	0.85
1435	1.00	7.59	2.66	3.03	0.76	2.94	1.03	1.17	0.29	4.43	1.55	1.77	0.44	5.42	1.90	2.17	0.54	6.66	2.33	2.66	0.67	8.51	2.98	3.40	0.85
1440	1.00	7.60	2.66	3.04	0.76	2.94	1.03	1.18	0.29	4.44	1.55	1.78	0.44	5.43	1.90	2.17	0.54	6.67	2.34	2.67	0.67	8.53	2.98	3.41	0.85

SUBAREA A2 HYETOPRAPHS

- Per 2006 Los Angeles County Hydrology Manual Appendix A

24 HR ISOHYETS,IN					
50 YR	2 YR	5 YR	10 YR	25 YR	100 YR
7.4	2.9	4.3	5.3	6.5	8.3



UNIT HYETOGRAPH		50 YR - 24 HR					2 YR - 24 HR					5 YR - 24 HR					10 YR - 24 HR					25 YR - 24 HR					100 YR - 24 HR				
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth					
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY						
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
30	0.01	0.08	0.03	0.03	0.01	0.03	0.01	0.01	0.00	0.05	0.02	0.02	0.00	0.06	0.02	0.02	0.01	0.07	0.03	0.03	0.01	0.09	0.03	0.04	0.01						
60	0.02	0.17	0.06	0.07	0.02	0.06	0.02	0.03	0.01	0.10	0.03	0.04	0.01	0.12	0.04	0.05	0.01	0.15	0.05	0.06	0.01	0.19	0.06	0.07	0.02						
90	0.03	0.25	0.09	0.10	0.02	0.10	0.03	0.04	0.01	0.15	0.05	0.06	0.01	0.18	0.06	0.07	0.02	0.22	0.08	0.09	0.02	0.28	0.10	0.11	0.03						
120	0.05	0.34	0.12	0.13	0.03	0.13	0.05	0.05	0.01	0.20	0.07	0.08	0.02	0.24	0.08	0.10	0.02	0.29	0.10	0.12	0.03	0.38	0.13	0.15	0.04						
150	0.06	0.42	0.15	0.17	0.04	0.16	0.06	0.07	0.02	0.25	0.09	0.10	0.02	0.30	0.11	0.12	0.03	0.37	0.13	0.15	0.04	0.47	0.17	0.19	0.05						
180	0.07	0.51	0.18	0.20	0.05	0.20	0.07	0.08	0.02	0.30	0.10	0.12	0.03	0.36	0.13	0.15	0.04	0.45	0.16	0.18	0.04	0.57	0.20	0.23	0.06						
210	0.08	0.60	0.21	0.24	0.06	0.23	0.08	0.09	0.02	0.35	0.12	0.14	0.03	0.43	0.15	0.17	0.04	0.53	0.18	0.21	0.05	0.67	0.24	0.27	0.07						
240	0.09	0.69	0.24	0.28	0.07	0.27	0.09	0.11	0.03	0.40	0.14	0.16	0.04	0.49	0.17	0.20	0.05	0.61	0.21	0.24	0.06	0.77	0.27	0.31	0.08						
270	0.11	0.78	0.27	0.31	0.08	0.30	0.11	0.12	0.03	0.46	0.16	0.18	0.05	0.56	0.20	0.22	0.06	0.69	0.24	0.27	0.07	0.88	0.31	0.35	0.09						
300	0.12	0.87	0.31	0.35	0.09	0.34	0.12	0.14	0.03	0.51	0.18	0.20	0.05	0.62	0.22	0.25	0.06	0.77	0.27	0.31	0.08	0.98	0.34	0.39	0.10						
330	0.13	0.97	0.34	0.39	0.10	0.38	0.13	0.15	0.04	0.57	0.20	0.23	0.06	0.69	0.24	0.28	0.07	0.85	0.30	0.34	0.09	1.09	0.38	0.44	0.11						
360	0.14	1.07	0.37	0.43	0.11	0.41	0.14	0.17	0.04	0.62	0.22	0.25	0.06	0.76	0.27	0.30	0.08	0.94	0.33	0.37	0.09	1.20	0.42	0.48	0.12						
390	0.16	1.16	0.41	0.47	0.12	0.45	0.16	0.18	0.05	0.68	0.24	0.27	0.07	0.83	0.29	0.33	0.08	1.02	0.36	0.41	0.10	1.31	0.46	0.52	0.13						
420	0.17	1.26	0.44	0.51	0.13	0.49	0.17	0.20	0.05	0.74	0.26	0.30	0.07	0.90	0.32	0.36	0.09	1.11	0.39	0.44	0.11	1.42	0.50	0.57	0.14						
450	0.18	1.37	0.48	0.55	0.14	0.53	0.19	0.21	0.05	0.80	0.28	0.32	0.08	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.53	0.54	0.61	0.15						
480	0.20	1.47	0.51	0.59	0.15	0.57	0.20	0.23	0.06	0.86	0.30	0.34	0.09	1.05	0.37	0.42	0.11	1.29	0.45	0.52	0.13	1.65	0.58	0.66	0.17						
510	0.21	1.58	0.55	0.63	0.16	0.61	0.21	0.24	0.06	0.92	0.32	0.37	0.09	1.13	0.39	0.45	0.11	1.38	0.48	0.55	0.14	1.77	0.62	0.71	0.18						
540	0.23	1.69	0.59	0.67	0.17	0.65	0.23	0.26	0.07	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.48	0.52	0.59	0.15	1.89	0.66	0.76	0.19						
570	0.24	1.80	0.63	0.72	0.18	0.70	0.24	0.28	0.07	1.05	0.37	0.42	0.10	1.28	0.45	0.51	0.13	1.58	0.55	0.63	0.16	2.02	0.71	0.81	0.20						

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
600	0.26	1.91	0.67	0.76	0.19	0.74	0.26	0.30	0.07	1.12	0.39	0.45	0.11	1.36	0.48	0.55	0.14	1.68	0.59	0.67	0.17	2.14	0.75	0.86	0.21
630	0.27	2.03	0.71	0.81	0.20	0.79	0.27	0.31	0.08	1.18	0.41	0.47	0.12	1.45	0.51	0.58	0.14	1.78	0.62	0.71	0.18	2.28	0.80	0.91	0.23
660	0.29	2.15	0.75	0.86	0.21	0.83	0.29	0.33	0.08	1.25	0.44	0.50	0.13	1.53	0.54	0.61	0.15	1.89	0.66	0.75	0.19	2.41	0.84	0.96	0.24
690	0.31	2.27	0.80	0.91	0.23	0.88	0.31	0.35	0.09	1.33	0.46	0.53	0.13	1.62	0.57	0.65	0.16	2.00	0.70	0.80	0.20	2.55	0.89	1.02	0.25
720	0.32	2.40	0.84	0.96	0.24	0.93	0.33	0.37	0.09	1.40	0.49	0.56	0.14	1.71	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.69	0.94	1.08	0.27
750	0.34	2.53	0.89	1.01	0.25	0.98	0.34	0.39	0.10	1.48	0.52	0.59	0.15	1.81	0.63	0.72	0.18	2.22	0.78	0.89	0.22	2.84	0.99	1.14	0.28
780	0.36	2.67	0.93	1.07	0.27	1.03	0.36	0.41	0.10	1.56	0.55	0.62	0.16	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.99	1.05	1.20	0.30
810	0.38	2.81	0.98	1.12	0.28	1.09	0.38	0.43	0.11	1.64	0.57	0.66	0.16	2.01	0.70	0.80	0.20	2.47	0.86	0.99	0.25	3.15	1.10	1.26	0.32
840	0.40	2.96	1.04	1.18	0.30	1.14	0.40	0.46	0.11	1.73	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.60	0.91	1.04	0.26	3.32	1.16	1.33	0.33
870	0.42	3.11	1.09	1.24	0.31	1.20	0.42	0.48	0.12	1.82	0.64	0.73	0.18	2.22	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.49	1.22	1.40	0.35
900	0.44	3.27	1.15	1.31	0.33	1.27	0.44	0.51	0.13	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.88	1.01	1.15	0.29	3.67	1.29	1.47	0.37
930	0.47	3.45	1.21	1.38	0.34	1.33	0.47	0.53	0.13	2.01	0.70	0.81	0.20	2.46	0.86	0.98	0.25	3.03	1.06	1.21	0.30	3.87	1.35	1.55	0.39
960	0.49	3.63	1.27	1.45	0.36	1.40	0.49	0.56	0.14	2.12	0.74	0.85	0.21	2.59	0.91	1.04	0.26	3.19	1.12	1.27	0.32	4.07	1.43	1.63	0.41
970	0.50	3.69	1.29	1.48	0.37	1.43	0.50	0.57	0.14	2.16	0.75	0.86	0.22	2.64	0.92	1.05	0.26	3.24	1.14	1.30	0.32	4.14	1.45	1.66	0.41
980	0.51	3.76	1.32	1.50	0.38	1.45	0.51	0.58	0.15	2.20	0.77	0.88	0.22	2.68	0.94	1.07	0.27	3.30	1.16	1.32	0.33	4.22	1.48	1.69	0.42
990	0.52	3.83	1.34	1.53	0.38	1.48	0.52	0.59	0.15	2.23	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.36	1.18	1.34	0.34	4.29	1.50	1.72	0.43
1000	0.53	3.90	1.36	1.56	0.39	1.51	0.53	0.60	0.15	2.28	0.80	0.91	0.23	2.78	0.97	1.11	0.28	3.42	1.20	1.37	0.34	4.37	1.53	1.75	0.44
1010	0.54	3.97	1.39	1.59	0.40	1.54	0.54	0.61	0.15	2.32	0.81	0.93	0.23	2.83	0.99	1.13	0.28	3.48	1.22	1.39	0.35	4.45	1.56	1.78	0.45
1020	0.55	4.04	1.41	1.62	0.40	1.56	0.55	0.63	0.16	2.36	0.83	0.94	0.24	2.89	1.01	1.15	0.29	3.55	1.24	1.42	0.35	4.54	1.59	1.81	0.45
1030	0.56	4.12	1.44	1.65	0.41	1.59	0.56	0.64	0.16	2.41	0.84	0.96	0.24	2.94	1.03	1.18	0.29	3.62	1.27	1.45	0.36	4.62	1.62	1.85	0.46
1040	0.57	4.20	1.47	1.68	0.42	1.62	0.57	0.65	0.16	2.45	0.86	0.98	0.25	3.00	1.05	1.20	0.30	3.69	1.29	1.47	0.37	4.71	1.65	1.88	0.47
1050	0.58	4.28	1.50	1.71	0.43	1.66	0.58	0.66	0.17	2.50	0.88	1.00	0.25	3.06	1.07	1.22	0.31	3.76	1.32	1.50	0.38	4.80	1.68	1.92	0.48
1060	0.59	4.37	1.53	1.75	0.44	1.69	0.59	0.68	0.17	2.55	0.89	1.02	0.26	3.12	1.09	1.25	0.31	3.84	1.34	1.53	0.38	4.90	1.72	1.96	0.49
1070	0.60	4.46	1.56	1.78	0.45	1.73	0.60	0.69	0.17	2.61	0.91	1.04	0.26	3.19	1.11	1.27	0.32	3.92	1.37	1.57	0.39	5.01	1.75	2.00	0.50
1080	0.62	4.56	1.60	1.82	0.46	1.76	0.62	0.71	0.18	2.66	0.93	1.06	0.27	3.25	1.14	1.30	0.33	4.00	1.40	1.60	0.40	5.11	1.79	2.05	0.51
1090	0.63	4.66	1.63	1.86	0.47	1.80	0.63	0.72	0.18	2.72	0.95	1.09	0.27	3.33	1.17	1.33	0.33	4.09	1.43	1.64	0.41	5.23	1.83	2.09	0.52
1100	0.65	4.77	1.67	1.91	0.48	1.85	0.65	0.74	0.18	2.79	0.98	1.12	0.28	3.41	1.19	1.36	0.34	4.19	1.47	1.68	0.42	5.36	1.87	2.14	0.54
1110	0.66	4.90	1.71	1.96	0.49	1.89	0.66	0.76	0.19	2.86	1.00	1.14	0.29	3.50	1.22	1.40	0.35	4.30	1.50	1.72	0.43	5.49	1.92	2.20	0.55
1115	0.67	4.96	1.74	1.99	0.50	1.92	0.67	0.77	0.19	2.90	1.01	1.16	0.29	3.54	1.24	1.42	0.35	4.36	1.53	1.74	0.44	5.57	1.95	2.23	0.56
1120	0.68	5.03	1.76	2.01	0.50	1.95	0.68	0.78	0.19	2.94	1.03	1.18	0.29	3.59	1.26	1.44	0.36	4.42	1.55	1.77	0.44	5.65	1.98	2.26	0.56
1125	0.69	5.11	1.79	2.04	0.51	1.98	0.69	0.79	0.20	2.98	1.04	1.19	0.30	3.65	1.28	1.46	0.36	4.49	1.57	1.79	0.45	5.73	2.01	2.29	0.57
1130	0.70	5.19	1.82	2.08	0.52	2.01	0.70	0.80	0.20	3.03	1.06	1.21	0.30	3.71	1.30	1.48	0.37	4.56	1.60	1.82	0.46	5.83	2.04	2.33	0.58
1135	0.71	5.29	1.85	2.11	0.53	2.05	0.72	0.82	0.20	3.09	1.08	1.23	0.31	3.77	1.32	1.51	0.38	4.64	1.62	1.86	0.46	5.93	2.08	2.37	0.59
1136	0.72	5.31	1.86	2.12	0.53	2.05	0.72	0.82	0.21	3.10	1.08	1.24	0.31	3.79	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.95	2.08	2.38	0.60
1137	0.72	5.33	1.86	2.13	0.53	2.06	0.72	0.82	0.21	3.11	1.09	1.24	0.31	3.80	1.33	1.52	0.38	4.68	1.64	1.87	0.47	5.98	2.09	2.39	0.60
1138	0.72	5.35	1.87	2.14	0.53	2.07	0.72	0.83	0.21	3.12	1.09	1.25	0.31	3.82	1.34	1.53	0.38	4.70	1.64	1.88	0.47	6.00	2.10	2.40	0.60
1139	0.73	5.37	1.88	2.15	0.54	2.08	0.73	0.83	0.21	3.14	1.10	1.25	0.31	3.83	1.34	1.53	0.38	4.72	1.65	1.89	0.47	6.03	2.11	2.41	0.60
1140	0.73	5.39	1.89	2.16	0.54	2.09	0.73	0.83	0.21	3.15	1.10	1.26	0.31	3.85	1.35	1.54	0.39	4.74	1.66	1.89	0.47	6.05	2.12	2.42	0.61
1145	0.75	5.52	1.93	2.21	0.55	2.14	0.75	0.86	0.21	3.23	1.13	1.29	0.32	3.94	1.38	1.58	0.39	4.85	1.70	1.94	0.49	6.20	2.17	2.48	0.62
1150	0.77	5.72	2.00	2.29	0.57	2.21	0.77	0.88	0.22	3.34	1.17	1.34	0.33	4.08	1.43	1.63	0.41	5.02	1.76	2.01	0.50	6.41	2.24	2.57	0.64
1151	0.78	5.78	2.02	2.31	0.58	2.24	0.78	0.89	0.22	3.37	1.18	1.35	0.34	4.13	1.44	1.65	0.41	5.07	1.78	2.03	0.51	6.48	2.27	2.59	0.65
1152	0.80	5.92	2.07	2.37	0.59	2.29	0.80	0.92	0.23	3.46	1.21	1.38	0.35	4.23	1.48	1.69	0.42	5.20	1.82	2.08	0.52	6.64	2.32	2.66	0.66
1153	0.81	5.99	2.10	2.40	0.60	2.32	0.81	0.93	0.23	3.50	1.23	1.40	0.35	4.28	1.50	1.71	0.43	5.26	1.84	2.10	0.53	6.72	2.35	2.69	0.67
1154	0.81	6.03	2.11	2.41	0.60	2.33	0.82	0.93	0.23	3.52	1.23	1.41	0.35	4.30	1.51	1.72	0.43	5.29	1.85	2.12	0.53	6.76	2.37	2.70	0.68
1155	0.82	6.05	2.12	2.42	0.61	2.34	0.82	0.94	0.23	3.53	1.24	1.41	0.35	4.32	1.51	1.73	0.43	5.31	1.86	2.13	0.53	6.79	2.38	2.72	0.68
1156	0.82	6.07	2.13	2.43	0.61	2.35	0.82	0.94	0.24	3.55	1.24	1.42	0.35	4.34	1.52	1.73	0.43	5.33	1.87	2.13	0.53	6.81	2.39	2.73	0.68
1157	0.82	6.09	2.13	2.44	0.61	2.36	0.83	0.94	0.24	3.56	1.25	1.42	0.36	4.35	1.52	1.74	0.44	5.35	1.87	2.14	0.53	6.84	2.39	2.73	0.68
1158	0.83	6.11	2.14	2.44	0.61	2.36	0.83	0.95	0.24	3.57	1.25	1.43	0.36	4.36	1.53	1.75	0.44	5.36	1.88	2.15	0.54	6.86	2.40	2.74	0.69
1159	0.83	6.13	2.14	2.45	0.61	2.37	0.83	0.95	0.24	3.58	1.25	1.43	0.36	4.37	1.53	1.75	0.44	5.38	1.88	2.15	0.54	6.87	2.41	2.75	0.69
1160	0.83	6.14																							

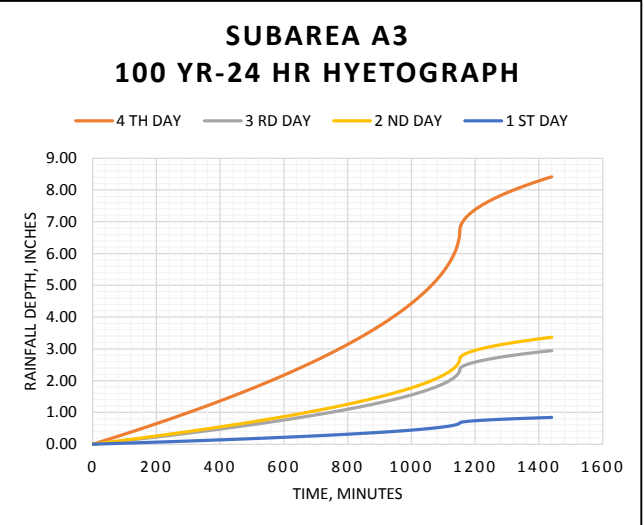
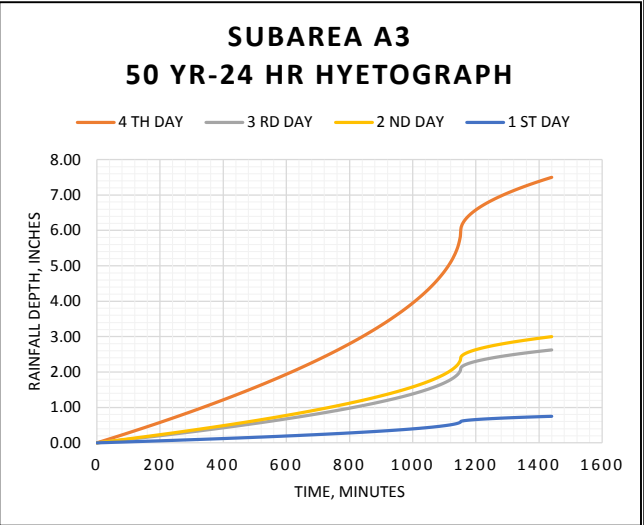
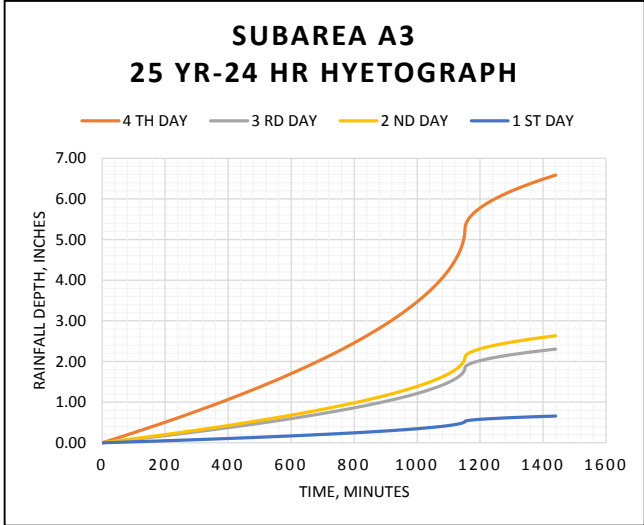
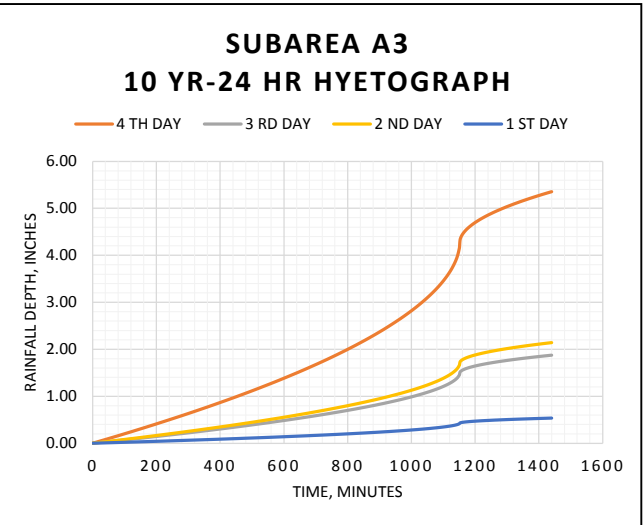
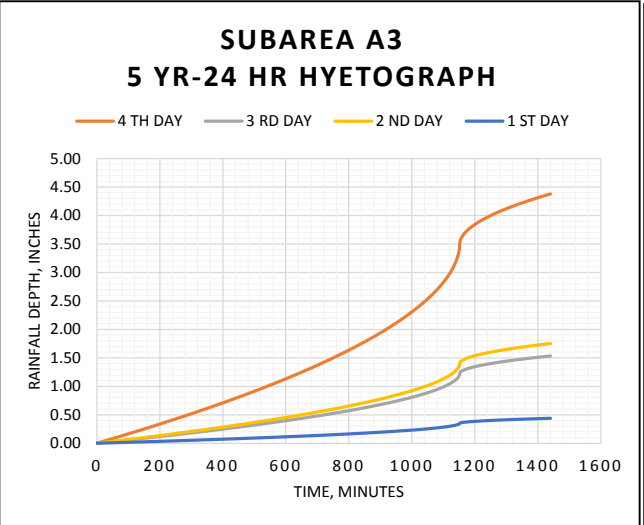
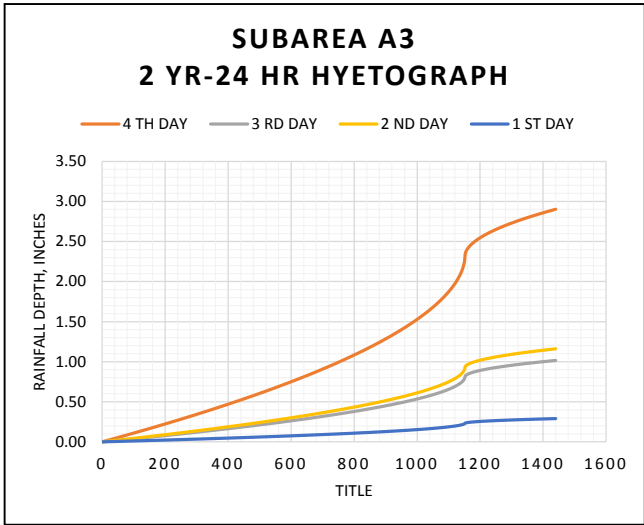
UNIT HYETOGRAPH		50 YR - 24 HR					2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	
1178	0.86	6.33	2.22	2.53	0.63	2.45	0.86	0.98	0.25	3.70	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.56	1.95	2.22	0.56	7.11	2.49	2.84	0.71	
1179	0.86	6.34	2.22	2.54	0.63	2.45	0.86	0.98	0.25	3.70	1.30	1.48	0.37	4.53	1.58	1.81	0.45	5.57	1.95	2.23	0.56	7.12	2.49	2.85	0.71	
1180	0.86	6.35	2.22	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.53	1.59	1.81	0.45	5.58	1.95	2.23	0.56	7.13	2.49	2.85	0.71	
1181	0.86	6.36	2.23	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.49	0.37	4.54	1.59	1.82	0.45	5.58	1.95	2.23	0.56	7.13	2.50	2.85	0.71	
1182	0.86	6.37	2.23	2.55	0.64	2.46	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.45	5.59	1.96	2.24	0.56	7.14	2.50	2.86	0.71	
1183	0.86	6.37	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.15	2.50	2.86	0.72	
1184	0.86	6.38	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.73	1.30	1.49	0.37	4.56	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.16	2.51	2.86	0.72	
1185	0.86	6.39	2.24	2.56	0.64	2.47	0.87	0.99	0.25	3.73	1.31	1.49	0.37	4.56	1.60	1.82	0.46	5.61	1.96	2.24	0.56	7.17	2.51	2.87	0.72	
1186	0.86	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.49	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.18	2.51	2.87	0.72	
1187	0.87	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.19	2.51	2.87	0.72	
1188	0.87	6.41	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.63	1.97	2.25	0.56	7.19	2.52	2.88	0.72	
1189	0.87	6.42	2.25	2.57	0.64	2.48	0.87	0.99	0.25	3.75	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.64	1.97	2.25	0.56	7.20	2.52	2.88	0.72	
1190	0.87	6.43	2.25	2.57	0.64	2.49	0.87	0.99	0.25	3.75	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.64	1.97	2.26	0.56	7.21	2.52	2.88	0.72	
1191	0.87	6.43	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.76	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.65	1.98	2.26	0.56	7.22	2.53	2.89	0.72	
1192	0.87	6.44	2.25	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.50	0.38	4.60	1.61	1.84	0.46	5.65	1.98	2.26	0.57	7.23	2.53	2.89	0.72	
1193	0.87	6.45	2.26	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.51	0.38	4.60	1.61	1.84	0.46	5.66	1.98	2.26	0.57	7.23	2.53	2.89	0.72	
1194	0.87	6.45	2.26	2.58	0.65	2.50	0.87	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.84	0.46	5.67	1.98	2.27	0.57	7.24	2.53	2.90	0.72	
1195	0.87	6.46	2.26	2.58	0.65	2.50	0.88	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.85	0.46	5.67	1.99	2.27	0.57	7.25	2.54	2.90	0.72	
1196	0.87	6.47	2.26	2.59	0.65	2.50	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.90	0.73	
1197	0.87	6.47	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.91	0.73	
1198	0.88	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.27	2.54	2.91	0.73	
1199	0.88	6.49	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.52	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.28	2.55	2.91	0.73	
1200	0.88	6.49	2.27	2.60	0.65	2.51	0.88	1.01	0.25	3.79	1.33	1.52	0.38	4.64	1.62	1.85	0.46	5.70	2.00	2.28	0.57	7.28	2.55	2.91	0.73	
1201	0.88	6.50	2.27	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.62	1.86	0.46	5.71	2.00	2.28	0.57	7.29	2.55	2.92	0.73	
1202	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.63	1.86	0.46	5.71	2.00	2.28	0.57	7.30	2.55	2.92	0.73	
1203	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.65	1.63	1.86	0.46	5.72	2.00	2.29	0.57	7.31	2.56	2.92	0.73	
1204	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.65	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.31	2.56	2.93	0.73	
1205	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.73	2.00	2.29	0.57	7.32	2.56	2.93	0.73	
1206	0.88	6.53	2.29	2.61	0.65	2.53	0.88	1.01	0.25	3.81	1.33	1.53	0.38	4.66	1.63	1.86	0.47	5.73	2.01	2.29	0.57	7.33	2.56	2.93	0.73	
1207	0.88	6.54	2.29	2.61	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.33	2.57	2.93	0.73	
1208	0.88	6.54	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.34	2.57	2.94	0.73	
1209	0.88	6.55	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.64	1.87	0.47	5.75	2.01	2.30	0.57	7.35	2.57	2.94	0.73	
1210	0.89	6.55	2.29	2.62	0.66	2.54	0.89	1.01	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.75	2.01	2.30	0.58	7.35	2.57	2.94	0.74	
1211	0.89	6.56	2.30	2.62	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.76	2.02	2.30	0.58	7.36	2.58	2.94	0.74	
1212	0.89	6.56	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.69	1.64	1.87	0.47	5.76	2.02	2.31	0.58	7.37	2.58	2.95	0.74	
1213	0.89	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.53	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.37	2.58	2.95	0.74	
1214	0.89	6.58	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.54	0.38	4.70	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.38	2.58	2.95	0.74	
1215	0.89	6.58	2.30	2.63	0.66	2.55	0.89	1.02	0.25	3.84	1.35	1.54	0.38	4.70	1.64	1.88	0.47	5.78	2.02	2.31	0.58	7.38	2.58	2.95	0.74	
1216	0.89	6.59	2.31	2.63	0.66	2.55	0.89	1.02	0.25	3.85	1.35	1.54	0.38	4.70	1.65	1.88	0.47	5.78	2.02	2.31	0.58	7.39	2.59	2.96	0.74	
1217	0.89	6.59	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.38	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74	
1218	0.89	6.60	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.39	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74	
1219	0.89	6.60	2.31	2.64	0.66	2.56	0.89	1.02	0.26	3.86	1.35	1.54	0.39	4.71	1.65	1.89	0.47	5.80	2.03	2.32	0.58	7.41	2.59	2.96	0.74	
1220	0.89	6.61	2.31	2.64	0.66	2.56	0.90	1.02	0.26	3.86	1.35	1.54	0.39	4.72	1.65	1.89	0.47	5.80	2.03	2.32	0.58	7.41	2.60	2.97	0.74	
1221	0.89	6.61	2.31	2.65	0.66	2.56	0.90	1.02	0.26	3.86	1.35	1.55	0.39	4.72	1.65	1.89	0.47	5.81	2.03	2.32	0.58	7.42	2.60	2.97	0.74	
1222	0.89	6.62	2.32	2.65	0.66	2.56	0.90	1.02	0.26	3.87	1.35	1.55	0.39	4.73	1.65	1.89	0.47	5.81	2.03	2.32	0.58	7.43	2.60	2.97	0.74	
1223	0.90	6.62	2.32	2.65	0.66	2.56	0.90	1.03	0.26	3.87	1.35	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.43	2.60	2.97	0.74	
1224	0.90	6.63	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.44	2.60	2.98	0.74	
1225	0.90	6.64	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.74	1.66	1.89	0.47	5.83	2.04	2.33	0.58	7.44	2.61	2.98	0.74	
1226	0.90	6.64	2.32	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.75	
1227	0.90	6.65	2.33	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.46	2.61	2.98	0.75	

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1285	0.93	6.90	2.42	2.76	0.69	2.67	0.93	1.07	0.27	4.03	1.41	1.61	0.40	4.93	1.72	1.97	0.49	6.06	2.12	2.42	0.61	7.74	2.71	3.10	0.77
1290	0.94	6.92	2.42	2.77	0.69	2.68	0.94	1.07	0.27	4.04	1.41	1.62	0.40	4.94	1.73	1.98	0.49	6.08	2.13	2.43	0.61	7.77	2.72	3.11	0.78
1295	0.94	6.94	2.43	2.78	0.69	2.69	0.94	1.07	0.27	4.05	1.42	1.62	0.41	4.96	1.73	1.98	0.50	6.09	2.13	2.44	0.61	7.79	2.73	3.12	0.78
1300	0.94	6.96	2.44	2.78	0.70	2.69	0.94	1.08	0.27	4.06	1.42	1.63	0.41	4.97	1.74	1.99	0.50	6.11	2.14	2.44	0.61	7.81	2.73	3.12	0.78
1305	0.94	6.98	2.44	2.79	0.70	2.70	0.95	1.08	0.27	4.08	1.43	1.63	0.41	4.98	1.74	1.99	0.50	6.13	2.14	2.45	0.61	7.83	2.74	3.13	0.78
1310	0.95	7.00	2.45	2.80	0.70	2.71	0.95	1.08	0.27	4.09	1.43	1.63	0.41	5.00	1.75	2.00	0.50	6.14	2.15	2.46	0.61	7.85	2.75	3.14	0.79
1315	0.95	7.01	2.46	2.81	0.70	2.71	0.95	1.09	0.27	4.10	1.43	1.64	0.41	5.01	1.75	2.00	0.50	6.16	2.16	2.46	0.62	7.87	2.75	3.15	0.79
1320	0.95	7.03	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.11	1.44	1.64	0.41	5.02	1.76	2.01	0.50	6.17	2.16	2.47	0.62	7.89	2.76	3.16	0.79
1325	0.95	7.05	2.47	2.82	0.70	2.73	0.95	1.09	0.27	4.12	1.44	1.65	0.41	5.03	1.76	2.01	0.50	6.19	2.17	2.48	0.62	7.91	2.77	3.16	0.79
1330	0.95	7.07	2.47	2.83	0.71	2.73	0.96	1.09	0.27	4.13	1.44	1.65	0.41	5.05	1.77	2.02	0.50	6.20	2.17	2.48	0.62	7.93	2.78	3.17	0.79
1335	0.96	7.08	2.48	2.83	0.71	2.74	0.96	1.10	0.27	4.14	1.45	1.65	0.41	5.06	1.77	2.02	0.51	6.22	2.18	2.49	0.62	7.95	2.78	3.18	0.79
1340	0.96	7.10	2.49	2.84	0.71	2.75	0.96	1.10	0.27	4.15	1.45	1.66	0.41	5.07	1.77	2.03	0.51	6.23	2.18	2.49	0.62	7.97	2.79	3.19	0.80
1345	0.96	7.12	2.49	2.85	0.71	2.75	0.96	1.10	0.28	4.16	1.45	1.66	0.42	5.08	1.78	2.03	0.51	6.25	2.19	2.50	0.62	7.99	2.79	3.19	0.80
1350	0.96	7.13	2.50	2.85	0.71	2.76	0.97	1.10	0.28	4.17	1.46	1.67	0.42	5.09	1.78	2.04	0.51	6.26	2.19	2.51	0.63	8.00	2.80	3.20	0.80
1355	0.97	7.15	2.50	2.86	0.71	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.10	1.79	2.04	0.51	6.28	2.20	2.51	0.63	8.02	2.81	3.21	0.80
1360	0.97	7.17	2.51	2.87	0.72	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.12	1.79	2.05	0.51	6.29	2.20	2.52	0.63	8.04	2.81	3.22	0.80
1365	0.97	7.18	2.51	2.87	0.72	2.78	0.97	1.11	0.28	4.19	1.47	1.68	0.42	5.13	1.79	2.05	0.51	6.31	2.21	2.52	0.63	8.06	2.82	3.22	0.81
1370	0.97	7.20	2.52	2.88	0.72	2.79	0.97	1.11	0.28	4.20	1.47	1.68	0.42	5.14	1.80	2.06	0.51	6.32	2.21	2.53	0.63	8.07	2.83	3.23	0.81
1375	0.97	7.21	2.52	2.88	0.72	2.79	0.98	1.12	0.28	4.21	1.47	1.68	0.42	5.15	1.80	2.06	0.51	6.33	2.22	2.53	0.63	8.09	2.83	3.24	0.81
1380	0.98	7.23	2.53	2.89	0.72	2.80	0.98	1.12	0.28	4.22	1.48	1.69	0.42	5.16	1.81	2.06	0.52	6.35	2.22	2.54	0.63	8.11	2.84	3.24	0.81
1385	0.98	7.24	2.53	2.90	0.72	2.80	0.98	1.12	0.28	4.23	1.48	1.69	0.42	5.17	1.81	2.07	0.52	6.36	2.23	2.54	0.64	8.13	2.84	3.25	0.81
1390	0.98	7.26	2.54	2.90	0.73	2.81	0.98	1.12	0.28	4.24	1.48	1.70	0.42	5.18	1.81	2.07	0.52	6.37	2.23	2.55	0.64	8.14	2.85	3.26	0.81
1395	0.98	7.27	2.55	2.91	0.73	2.81	0.99	1.13	0.28	4.25	1.49	1.70	0.42	5.19	1.82	2.08	0.52	6.39	2.23	2.55	0.64	8.16	2.86	3.26	0.82
1400	0.98	7.29	2.55	2.91	0.73	2.82	0.99	1.13	0.28	4.26	1.49	1.70	0.43	5.20	1.82	2.08	0.52	6.40	2.24	2.56	0.64	8.18	2.86	3.27	0.82
1405	0.99	7.30	2.56	2.92	0.73	2.83	0.99	1.13	0.28	4.26	1.49	1.71	0.43	5.21	1.82	2.09	0.52	6.41	2.24	2.56	0.64	8.19	2.87	3.28	0.82
1410	0.99	7.32	2.56	2.93	0.73	2.83	0.99	1.13	0.28	4.27	1.50	1.71	0.43	5.22	1.83	2.09	0.52	6.42	2.25	2.57	0.64	8.21	2.87	3.28	0.82
1415	0.99	7.33	2.57	2.93	0.73	2.84	0.99	1.13	0.28	4.28	1.50	1.71	0.43	5.23	1.83	2.09	0.52	6.44	2.25	2.57	0.64	8.22	2.88	3.29	0.82
1420	0.99	7.34	2.57	2.94	0.73	2.84	0.99	1.14	0.28	4.29	1.50	1.72	0.43	5.24	1.84	2.10	0.52	6.45	2.26	2.58	0.64	8.24	2.88	3.30	0.82
1425	0.99	7.36	2.58	2.94	0.74	2.85	1.00	1.14	0.28	4.30	1.50	1.72	0.43	5.25	1.84	2.10	0.53	6.46	2.26	2.58	0.65	8.26	2.89	3.30	0.83
1430	1.00	7.37	2.58	2.95	0.74	2.85	1.00	1.14	0.29	4.31	1.51	1.72	0.43	5.26	1.84	2.11	0.53	6.47	2.27	2.59	0.65	8.27	2.90	3.31	0.83
1435	1.00	7.39	2.59	2.95	0.74	2.86	1.00	1.14	0.29	4.31	1.51	1.73	0.43	5.27	1.85	2.11	0.53	6.49	2.27	2.59	0.65	8.29	2.90	3.31	0.83
1440	1.00	7.40	2.59	2.96	0.74	2.86	1.00	1.15	0.29	4.32	1.51	1.73	0.43	5.28	1.85	2.11	0.53	6.50	2.27	2.60	0.65	8.30	2.91	3.32	0.83

SUBAREA A3 HYETOPRAPHS

- Per 2006 Los Angeles County Hydrology Manual Appendix A

24 HR ISOHYETS,IN					
50 YR	2 YR	5 YR	10 YR	25 YR	100 YR
7.5	2.9	4.4	5.4	6.6	8.4



UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.01	0.08	0.03	0.03	0.01	0.03	0.01	0.01	0.00	0.05	0.02	0.02	0.00	0.06	0.02	0.02	0.01	0.07	0.03	0.03	0.01	0.09	0.03	0.04	0.01
60	0.02	0.17	0.06	0.07	0.02	0.06	0.02	0.03	0.01	0.10	0.03	0.04	0.01	0.12	0.04	0.05	0.01	0.15	0.05	0.06	0.01	0.19	0.07	0.08	0.02
90	0.03	0.25	0.09	0.10	0.03	0.10	0.03	0.04	0.01	0.15	0.05	0.06	0.01	0.18	0.06	0.07	0.02	0.22	0.08	0.09	0.02	0.28	0.10	0.11	0.03
120	0.05	0.34	0.12	0.14	0.03	0.13	0.05	0.05	0.01	0.20	0.07	0.08	0.02	0.24	0.08	0.10	0.02	0.30	0.10	0.12	0.03	0.38	0.13	0.15	0.04
150	0.06	0.43	0.15	0.17	0.04	0.17	0.06	0.07	0.02	0.25	0.09	0.10	0.02	0.31	0.11	0.12	0.03	0.38	0.13	0.15	0.04	0.48	0.17	0.19	0.05
180	0.07	0.52	0.18	0.21	0.05	0.20	0.07	0.08	0.02	0.30	0.11	0.12	0.03	0.37	0.13	0.15	0.04	0.45	0.16	0.18	0.05	0.58	0.20	0.23	0.06
210	0.08	0.61	0.21	0.24	0.06	0.23	0.08	0.09	0.02	0.35	0.12	0.14	0.04	0.43	0.15	0.17	0.04	0.53	0.19	0.21	0.05	0.68	0.24	0.27	0.07
240	0.09	0.70	0.24	0.28	0.07	0.27	0.09	0.11	0.03	0.41	0.14	0.16	0.04	0.50	0.17	0.20	0.05	0.61	0.21	0.25	0.06	0.78	0.27	0.31	0.08
270	0.11	0.79	0.28	0.32	0.08	0.31	0.11	0.12	0.03	0.46	0.16	0.18	0.05	0.57	0.20	0.23	0.06	0.70	0.24	0.28	0.07	0.89	0.31	0.36	0.09
300	0.12	0.89	0.31	0.35	0.09	0.34	0.12	0.14	0.03	0.52	0.18	0.21	0.05	0.63	0.22	0.25	0.06	0.78	0.27	0.31	0.08	0.99	0.35	0.40	0.10
330	0.13	0.98	0.34	0.39	0.10	0.38	0.13	0.15	0.04	0.57	0.20	0.23	0.06	0.70	0.25	0.28	0.07	0.86	0.30	0.35	0.09	1.10	0.39	0.44	0.11
360	0.14	1.08	0.38	0.43	0.11	0.42	0.15	0.17	0.04	0.63	0.22	0.25	0.06	0.77	0.27	0.31	0.08	0.95	0.33	0.38	0.09	1.21	0.42	0.49	0.12
390	0.16	1.18	0.41	0.47	0.12	0.46	0.16	0.18	0.05	0.69	0.24	0.28	0.07	0.84	0.29	0.34	0.08	1.04	0.36	0.41	0.10	1.32	0.46	0.53	0.13
420	0.17	1.28	0.45	0.51	0.13	0.50	0.17	0.20	0.05	0.75	0.26	0.30	0.07	0.92	0.32	0.37	0.09	1.13	0.39	0.45	0.11	1.44	0.50	0.58	0.14

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
450	0.18	1.39	0.48	0.55	0.14	0.54	0.19	0.21	0.05	0.81	0.28	0.32	0.08	0.99	0.35	0.40	0.10	1.22	0.43	0.49	0.12	1.55	0.54	0.62	0.16
480	0.20	1.49	0.52	0.60	0.15	0.58	0.20	0.23	0.06	0.87	0.30	0.35	0.09	1.06	0.37	0.43	0.11	1.31	0.46	0.52	0.13	1.67	0.59	0.67	0.17
510	0.21	1.60	0.56	0.64	0.16	0.62	0.22	0.25	0.06	0.93	0.33	0.37	0.09	1.14	0.40	0.46	0.11	1.40	0.49	0.56	0.14	1.79	0.63	0.72	0.18
540	0.23	1.71	0.60	0.68	0.17	0.66	0.23	0.26	0.07	1.00	0.35	0.40	0.10	1.22	0.43	0.49	0.12	1.50	0.53	0.60	0.15	1.92	0.67	0.77	0.19
570	0.24	1.82	0.64	0.73	0.18	0.71	0.25	0.28	0.07	1.06	0.37	0.43	0.11	1.30	0.46	0.52	0.13	1.60	0.56	0.64	0.16	2.04	0.72	0.82	0.20
600	0.26	1.94	0.68	0.77	0.19	0.75	0.26	0.30	0.07	1.13	0.40	0.45	0.11	1.38	0.48	0.55	0.14	1.70	0.60	0.68	0.17	2.17	0.76	0.87	0.22
630	0.27	2.06	0.72	0.82	0.21	0.80	0.28	0.32	0.08	1.20	0.42	0.48	0.12	1.47	0.51	0.59	0.15	1.81	0.63	0.72	0.18	2.31	0.81	0.92	0.23
660	0.29	2.18	0.76	0.87	0.22	0.84	0.29	0.34	0.08	1.27	0.45	0.51	0.13	1.55	0.54	0.62	0.16	1.91	0.67	0.76	0.19	2.44	0.86	0.98	0.24
690	0.31	2.30	0.81	0.92	0.23	0.89	0.31	0.36	0.09	1.34	0.47	0.54	0.13	1.64	0.58	0.66	0.16	2.02	0.71	0.81	0.20	2.58	0.90	1.03	0.26
720	0.32	2.43	0.85	0.97	0.24	0.94	0.33	0.38	0.09	1.42	0.50	0.57	0.14	1.74	0.61	0.69	0.17	2.14	0.75	0.85	0.21	2.73	0.96	1.09	0.27
750	0.34	2.57	0.90	1.03	0.26	0.99	0.35	0.40	0.10	1.50	0.52	0.60	0.15	1.83	0.64	0.73	0.18	2.25	0.79	0.90	0.23	2.88	1.01	1.15	0.29
780	0.36	2.70	0.95	1.08	0.27	1.05	0.37	0.42	0.10	1.58	0.55	0.63	0.16	1.93	0.68	0.77	0.19	2.37	0.83	0.95	0.24	3.03	1.06	1.21	0.30
810	0.38	2.85	1.00	1.14	0.28	1.10	0.39	0.44	0.11	1.66	0.58	0.67	0.17	2.03	0.71	0.81	0.20	2.50	0.88	1.00	0.25	3.20	1.12	1.28	0.32
840	0.40	3.00	1.05	1.20	0.30	1.16	0.41	0.46	0.12	1.75	0.61	0.70	0.18	2.14	0.75	0.86	0.21	2.63	0.92	1.05	0.26	3.36	1.18	1.35	0.34
870	0.42	3.15	1.10	1.26	0.32	1.22	0.43	0.49	0.12	1.84	0.64	0.74	0.18	2.25	0.79	0.90	0.23	2.77	0.97	1.11	0.28	3.54	1.24	1.42	0.35
900	0.44	3.32	1.16	1.33	0.33	1.28	0.45	0.51	0.13	1.94	0.68	0.78	0.19	2.37	0.83	0.95	0.24	2.91	1.02	1.17	0.29	3.72	1.30	1.49	0.37
930	0.47	3.49	1.22	1.40	0.35	1.35	0.47	0.54	0.14	2.04	0.71	0.82	0.20	2.49	0.87	1.00	0.25	3.07	1.07	1.23	0.31	3.92	1.37	1.57	0.39
960	0.49	3.68	1.29	1.47	0.37	1.42	0.50	0.57	0.14	2.15	0.75	0.86	0.21	2.63	0.92	1.05	0.26	3.23	1.13	1.29	0.32	4.13	1.44	1.65	0.41
970	0.50	3.74	1.31	1.50	0.37	1.45	0.51	0.58	0.14	2.19	0.77	0.87	0.22	2.67	0.94	1.07	0.27	3.29	1.15	1.31	0.33	4.20	1.47	1.68	0.42
980	0.51	3.81	1.33	1.52	0.38	1.47	0.52	0.59	0.15	2.23	0.78	0.89	0.22	2.72	0.95	1.09	0.27	3.35	1.17	1.34	0.33	4.28	1.50	1.71	0.43
990	0.52	3.88	1.36	1.55	0.39	1.50	0.53	0.60	0.15	2.27	0.79	0.91	0.23	2.77	0.97	1.11	0.28	3.41	1.19	1.36	0.34	4.35	1.52	1.74	0.44
1000	0.53	3.95	1.38	1.58	0.39	1.53	0.53	0.61	0.15	2.31	0.81	0.92	0.23	2.82	0.99	1.13	0.28	3.47	1.21	1.39	0.35	4.43	1.55	1.77	0.44
1010	0.54	4.02	1.41	1.61	0.40	1.56	0.54	0.62	0.16	2.35	0.82	0.94	0.23	2.87	1.01	1.15	0.29	3.53	1.24	1.41	0.35	4.51	1.58	1.80	0.45
1020	0.55	4.10	1.43	1.64	0.41	1.59	0.55	0.63	0.16	2.39	0.84	0.96	0.24	2.93	1.02	1.17	0.29	3.60	1.26	1.44	0.36	4.60	1.61	1.84	0.46
1030	0.56	4.17	1.46	1.67	0.42	1.62	0.57	0.65	0.16	2.44	0.85	0.98	0.24	2.98	1.04	1.19	0.30	3.67	1.28	1.47	0.37	4.68	1.64	1.87	0.47
1040	0.57	4.26	1.49	1.70	0.43	1.65	0.58	0.66	0.16	2.49	0.87	0.99	0.25	3.04	1.06	1.22	0.30	3.74	1.31	1.49	0.37	4.77	1.67	1.91	0.48
1050	0.58	4.34	1.52	1.74	0.43	1.68	0.59	0.67	0.17	2.53	0.89	1.01	0.25	3.10	1.08	1.24	0.31	3.81	1.33	1.52	0.38	4.87	1.70	1.95	0.49
1060	0.59	4.43	1.55	1.77	0.44	1.71	0.60	0.69	0.17	2.59	0.91	1.03	0.26	3.16	1.11	1.26	0.32	3.89	1.36	1.56	0.39	4.97	1.74	1.99	0.50
1070	0.60	4.52	1.58	1.81	0.45	1.75	0.61	0.70	0.17	2.64	0.92	1.06	0.26	3.23	1.13	1.29	0.32	3.97	1.39	1.59	0.40	5.07	1.78	2.03	0.51
1080	0.62	4.62	1.62	1.85	0.46	1.79	0.63	0.72	0.18	2.70	0.94	1.08	0.27	3.30	1.15	1.32	0.33	4.06	1.42	1.62	0.41	5.18	1.81	2.07	0.52
1090	0.63	4.72	1.65	1.89	0.47	1.83	0.64	0.73	0.18	2.76	0.97	1.10	0.28	3.37	1.18	1.35	0.34	4.15	1.45	1.66	0.41	5.30	1.86	2.12	0.53
1100	0.65	4.84	1.69	1.94	0.48	1.87	0.66	0.75	0.19	2.83	0.99	1.13	0.28	3.45	1.21	1.38	0.35	4.25	1.49	1.70	0.42	5.43	1.90	2.17	0.54
1110	0.66	4.96	1.74	1.99	0.50	1.92	0.67	0.77	0.19	2.90	1.01	1.16	0.29	3.54	1.24	1.42	0.35	4.36	1.53	1.74	0.44	5.57	1.95	2.23	0.56
1115	0.67	5.03	1.76	2.01	0.50	1.95	0.68	0.78	0.19	2.94	1.03	1.18	0.29	3.59	1.26	1.44	0.36	4.42	1.55	1.77	0.44	5.64	1.98	2.26	0.56
1120	0.68	5.10	1.79	2.04	0.51	1.97	0.69	0.79	0.20	2.98	1.04	1.19	0.30	3.64	1.27	1.46	0.36	4.48	1.57	1.79	0.45	5.72	2.00	2.29	0.57
1125	0.69	5.18	1.81	2.07	0.52	2.00	0.70	0.80	0.20	3.02	1.06	1.21	0.30	3.70	1.29	1.48	0.37	4.55	1.59	1.82	0.45	5.81	2.03	2.32	0.58
1130	0.70	5.26	1.84	2.11	0.53	2.04	0.71	0.81	0.20	3.07	1.08	1.23	0.31	3.76	1.32	1.50	0.38	4.62	1.62	1.85	0.46	5.91	2.07	2.36	0.59
1135	0.71	5.36	1.88	2.14	0.54	2.07	0.73	0.83	0.21	3.13	1.10	1.25	0.31	3.83	1.34	1.53	0.38	4.70	1.65	1.88	0.47	6.01	2.10	2.40	0.60
1136	0.72	5.38	1.88	2.15	0.54	2.08	0.73	0.83	0.21	3.14	1.10	1.26	0.31	3.84	1.34	1.54	0.38	4.72	1.65	1.89	0.47	6.03	2.11	2.41	0.60
1137	0.72	5.40	1.89	2.16	0.54	2.09	0.73	0.84	0.21	3.15	1.10	1.26	0.32	3.85	1.35	1.54	0.39	4.74	1.66	1.90	0.47	6.06	2.12	2.42	0.61
1138	0.72	5.42	1.90	2.17	0.54	2.10	0.73	0.84	0.21	3.17	1.11	1.27	0.32	3.87	1.35	1.55	0.39	4.76	1.67	1.90	0.48	6.08	2.13	2.43	0.61
1139	0.73	5.44	1.90	2.18	0.54	2.11	0.74	0.84	0.21	3.18	1.11	1.27	0.32	3.89	1.36	1.55	0.39	4.78	1.67	1.91	0.48	6.11	2.14	2.44	0.61
1140	0.73	5.47	1.91	2.19	0.55	2.12	0.74	0.85	0.21	3.19	1.12	1.28	0.32	3.90	1.37	1.56	0.39	4.80	1.68	1.92	0.48	6.13	2.15	2.45	0.61
1145	0.75	5.60	1.96	2.24	0.56	2.17	0.76	0.87	0.22	3.27	1.14	1.31	0.33	4.00	1.40	1.60	0.40	4.92	1.72	1.97	0.49	6.28	2.20	2.51	0.63
1150	0.77	5.79	2.03	2.32	0.58	2.24	0.78	0.90	0.22	3.38	1.18	1.35	0.34	4.14	1.45	1.65	0.41	5.09	1.78	2.03	0.51	6.50	2.28	2.60	0.65
1151	0.78	5.86	2.05	2.34	0.59	2.27	0.79	0.91	0.23	3.42	1.20	1.37	0.34	4.18	1.46	1.67	0.42	5.14	1.80	2.06	0.51	6.57	2.30	2.63	0.66
1152	0.80	6.00	2.10	2.40	0.60	2.32	0.81	0.93	0.23	3.50	1.23	1.40	0.35	4.28	1.50	1.71	0.43	5.27	1.84	2.11	0.53	6.73	2.36	2.69	0.67
1153	0.81	6.07	2.13	2.43	0.61	2.35	0.82	0.94	0.24	3.55	1.24	1.42	0.35	4.34	1.52	1.73	0.43	5.33	1.87	2.13	0.53	6.82	2.39	2.73	0.68
1154	0.81	6.11	2.14	2.44	0.61	2.36	0.83	0.95	0.24	3.57	1.25	1.43	0.36	4.36	1.53	1.74	0.44	5.36	1.88	2.15	0.54	6.85	2.40	2.74	0.69
1155	0.82	6.13																							

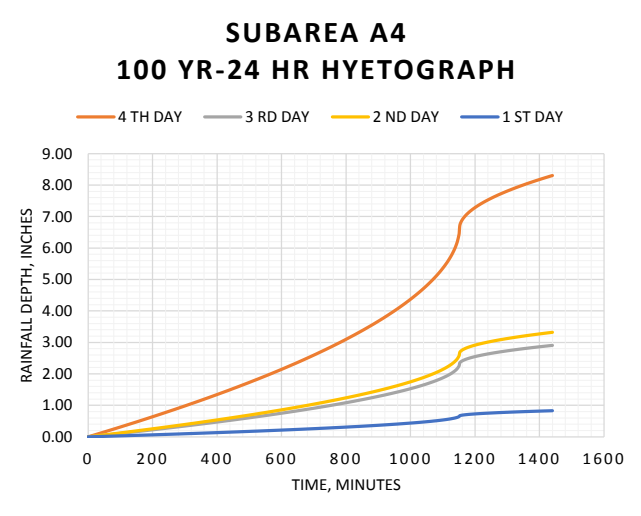
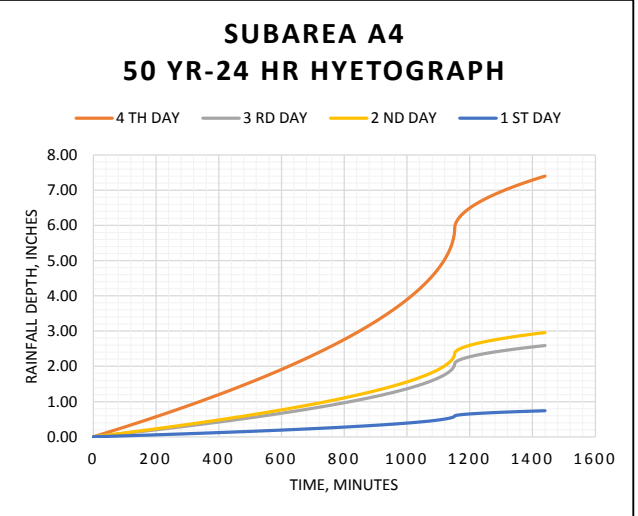
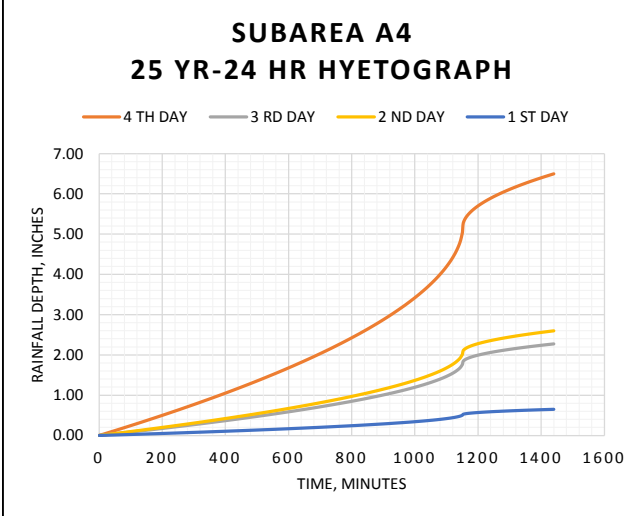
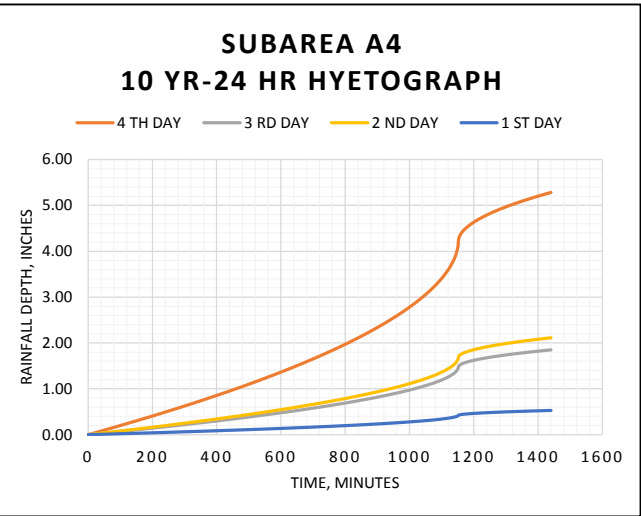
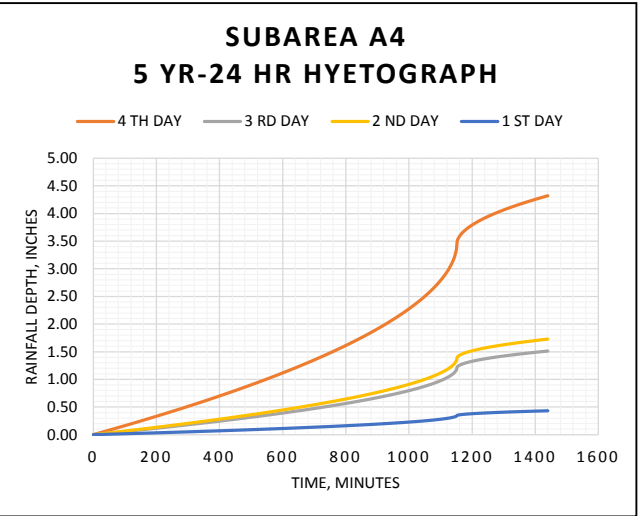
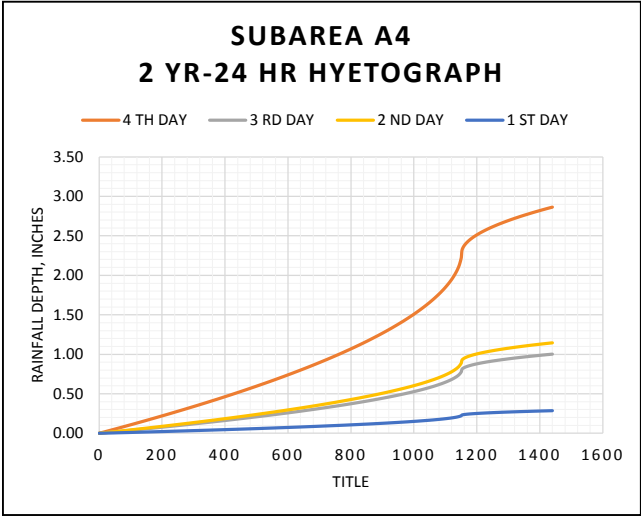
UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1168	0.84	6.32	2.21	2.53	0.63	2.45	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.55	1.94	2.22	0.56	7.10	2.48	2.84	0.71
1169	0.84	6.33	2.22	2.53	0.63	2.45	0.86	0.98	0.25	3.70	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.56	1.95	2.22	0.56	7.11	2.49	2.84	0.71
1170	0.85	6.35	2.22	2.54	0.63	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.53	1.59	1.81	0.45	5.57	1.95	2.23	0.56	7.12	2.49	2.85	0.71
1171	0.85	6.36	2.22	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.54	1.59	1.82	0.45	5.58	1.95	2.23	0.56	7.13	2.50	2.85	0.71
1172	0.85	6.36	2.23	2.55	0.64	2.46	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.54	1.59	1.82	0.45	5.59	1.96	2.24	0.56	7.14	2.50	2.86	0.71
1173	0.85	6.37	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.15	2.50	2.86	0.72
1174	0.85	6.38	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.73	1.30	1.49	0.37	4.56	1.60	1.82	0.46	5.60	1.96	2.24	0.56	7.16	2.51	2.87	0.72
1175	0.85	6.39	2.24	2.56	0.64	2.47	0.87	0.99	0.25	3.73	1.31	1.49	0.37	4.56	1.60	1.83	0.46	5.61	1.96	2.25	0.56	7.17	2.51	2.87	0.72
1176	0.85	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.18	2.51	2.87	0.72
1177	0.85	6.41	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.63	1.97	2.25	0.56	7.19	2.52	2.88	0.72
1178	0.86	6.42	2.25	2.57	0.64	2.48	0.87	0.99	0.25	3.75	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.64	1.97	2.25	0.56	7.20	2.52	2.88	0.72
1179	0.86	6.43	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.75	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.64	1.98	2.26	0.56	7.21	2.52	2.88	0.72
1180	0.86	6.44	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.50	0.38	4.60	1.61	1.84	0.46	5.65	1.98	2.26	0.57	7.22	2.53	2.89	0.72
1181	0.86	6.44	2.26	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.51	0.38	4.60	1.61	1.84	0.46	5.66	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1182	0.86	6.45	2.26	2.58	0.65	2.50	0.87	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.84	0.46	5.67	1.98	2.27	0.57	7.24	2.53	2.90	0.72
1183	0.86	6.46	2.26	2.58	0.65	2.50	0.88	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.85	0.46	5.67	1.99	2.27	0.57	7.25	2.54	2.90	0.72
1184	0.86	6.47	2.26	2.59	0.65	2.50	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.90	0.73
1185	0.86	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.69	1.99	2.27	0.57	7.27	2.54	2.91	0.73
1186	0.86	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.51	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.27	2.55	2.91	0.73
1187	0.87	6.49	2.27	2.60	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.52	0.38	4.63	1.62	1.85	0.46	5.70	1.99	2.28	0.57	7.28	2.55	2.91	0.73
1188	0.87	6.50	2.27	2.60	0.65	2.51	0.88	1.01	0.25	3.79	1.33	1.52	0.38	4.64	1.62	1.86	0.46	5.71	2.00	2.28	0.57	7.29	2.55	2.92	0.73
1189	0.87	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.63	1.86	0.46	5.71	2.00	2.28	0.57	7.30	2.55	2.92	0.73
1190	0.87	6.51	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.65	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.31	2.56	2.92	0.73
1191	0.87	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.32	2.56	2.93	0.73
1192	0.87	6.53	2.28	2.61	0.65	2.53	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.73	2.01	2.29	0.57	7.32	2.56	2.93	0.73
1193	0.87	6.53	2.29	2.61	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.29	0.57	7.33	2.57	2.93	0.73
1194	0.87	6.54	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.34	2.57	2.94	0.73
1195	0.87	6.55	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.64	1.87	0.47	5.75	2.01	2.30	0.57	7.35	2.57	2.94	0.73
1196	0.87	6.55	2.29	2.62	0.66	2.54	0.89	1.01	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.75	2.01	2.30	0.58	7.35	2.57	2.94	0.74
1197	0.87	6.56	2.30	2.62	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.76	2.02	2.30	0.58	7.36	2.58	2.94	0.74
1198	0.88	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.53	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.37	2.58	2.95	0.74
1199	0.88	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.54	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.38	2.58	2.95	0.74
1200	0.88	6.58	2.30	2.63	0.66	2.55	0.89	1.02	0.25	3.84	1.35	1.54	0.38	4.70	1.64	1.88	0.47	5.78	2.02	2.31	0.58	7.38	2.58	2.95	0.74
1201	0.88	6.59	2.31	2.63	0.66	2.55	0.89	1.02	0.25	3.85	1.35	1.54	0.38	4.70	1.65	1.88	0.47	5.78	2.02	2.31	0.58	7.39	2.59	2.96	0.74
1202	0.88	6.59	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.39	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1203	0.88	6.60	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.39	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1204	0.88	6.61	2.31	2.64	0.66	2.56	0.89	1.02	0.26	3.86	1.35	1.54	0.39	4.72	1.65	1.89	0.47	5.80	2.03	2.32	0.58	7.41	2.59	2.96	0.74
1205	0.88	6.61	2.31	2.64	0.66	2.56	0.90	1.02	0.26	3.86	1.35	1.54	0.39	4.72	1.65	1.89	0.47	5.81	2.03	2.32	0.58	7.42	2.60	2.97	0.74
1206	0.88	6.62	2.32	2.65	0.66	2.56	0.90	1.02	0.26	3.86	1.35	1.55	0.39	4.73	1.65	1.89	0.47	5.81	2.03	2.32	0.58	7.43	2.60	2.97	0.74
1207	0.88	6.62	2.32	2.65	0.66	2.56	0.90	1.03	0.26	3.87	1.35	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.43	2.60	2.97	0.74
1208	0.88	6.63	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.44	2.60	2.98	0.74
1209	0.88	6.64	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.74
1210	0.89	6.64	2.32	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.75
1211	0.89	6.65	2.33	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.75	1.66	1.90	0.47	5.84	2.04	2.33	0.58	7.46	2.61	2.98	0.75
1212	0.89	6.65	2.33	2.66	0.67	2.57	0.90	1.03	0.26	3.89	1.36	1.55	0.39	4.75	1.66	1.90	0.48	5.84	2.04	2.34	0.58	7.46	2.61	2.99	0.75
1213	0.89	6.66	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.75	1.66	1.90	0.48	5.85	2.05	2.34	0.58	7.47	2.61	2.99	0.75
1214	0.89	6.66	2.33	2.67	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.76	1.67	1.90	0.48	5.85	2.05	2.34	0.59	7.48	2.62	2.99	0.75
1215	0.89	6.67	2.33	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.76	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.48	2.62	2.99	0.75
1216	0.89	6.68	2.34	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.77	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.49	2.62	3.00	0.75
1217	0.89	6.68	2.34	2.67	0.67	2.59	0.91	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.62	3.00	0.75

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1230	0.90	6.75	2.36	2.70	0.68	2.61	0.91	1.04	0.26	3.94	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.07	2.37	0.59	7.57	2.65	3.03	0.76
1231	0.90	6.76	2.36	2.70	0.68	2.61	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.08	2.37	0.59	7.58	2.65	3.03	0.76
1232	0.90	6.76	2.37	2.70	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.83	1.69	1.93	0.48	5.94	2.08	2.37	0.59	7.59	2.65	3.03	0.76
1233	0.90	6.77	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.40	4.83	1.69	1.93	0.48	5.94	2.08	2.38	0.59	7.59	2.66	3.04	0.76
1234	0.90	6.77	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.40	4.83	1.69	1.93	0.48	5.94	2.08	2.38	0.59	7.60	2.66	3.04	0.76
1235	0.90	6.78	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.96	1.38	1.58	0.40	4.84	1.69	1.94	0.48	5.95	2.08	2.38	0.59	7.60	2.66	3.04	0.76
1240	0.91	6.80	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.86	1.70	1.94	0.49	5.97	2.09	2.39	0.60	7.63	2.67	3.05	0.76
1245	0.91	6.82	2.39	2.73	0.68	2.64	0.92	1.06	0.26	3.99	1.39	1.59	0.40	4.87	1.71	1.95	0.49	5.99	2.10	2.40	0.60	7.66	2.68	3.06	0.77
1250	0.91	6.85	2.40	2.74	0.68	2.65	0.93	1.06	0.26	4.00	1.40	1.60	0.40	4.89	1.71	1.96	0.49	6.01	2.10	2.40	0.60	7.68	2.69	3.07	0.77
1255	0.92	6.87	2.40	2.75	0.69	2.66	0.93	1.06	0.27	4.01	1.40	1.60	0.40	4.91	1.72	1.96	0.49	6.03	2.11	2.41	0.60	7.71	2.70	3.08	0.77
1260	0.92	6.89	2.41	2.76	0.69	2.67	0.93	1.07	0.27	4.02	1.41	1.61	0.40	4.92	1.72	1.97	0.49	6.05	2.12	2.42	0.61	7.73	2.71	3.09	0.77
1265	0.92	6.91	2.42	2.77	0.69	2.68	0.94	1.07	0.27	4.04	1.41	1.62	0.40	4.94	1.73	1.97	0.49	6.07	2.12	2.43	0.61	7.76	2.71	3.10	0.78
1270	0.92	6.93	2.43	2.77	0.69	2.68	0.94	1.07	0.27	4.05	1.42	1.62	0.40	4.95	1.73	1.98	0.50	6.09	2.13	2.44	0.61	7.78	2.72	3.11	0.78
1275	0.93	6.96	2.43	2.78	0.70	2.69	0.94	1.08	0.27	4.06	1.42	1.62	0.41	4.97	1.74	1.99	0.50	6.11	2.14	2.44	0.61	7.80	2.73	3.12	0.78
1280	0.93	6.98	2.44	2.79	0.70	2.70	0.94	1.08	0.27	4.07	1.43	1.63	0.41	4.98	1.74	1.99	0.50	6.12	2.14	2.45	0.61	7.83	2.74	3.13	0.78
1285	0.93	7.00	2.45	2.80	0.70	2.71	0.95	1.08	0.27	4.09	1.43	1.63	0.41	5.00	1.75	2.00	0.50	6.14	2.15	2.46	0.61	7.85	2.75	3.14	0.78
1290	0.94	7.02	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.10	1.43	1.64	0.41	5.01	1.75	2.00	0.50	6.16	2.16	2.46	0.62	7.87	2.76	3.15	0.79
1295	0.94	7.04	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.11	1.44	1.64	0.41	5.02	1.76	2.01	0.50	6.18	2.16	2.47	0.62	7.89	2.76	3.16	0.79
1300	0.94	7.05	2.47	2.82	0.71	2.73	0.96	1.09	0.27	4.12	1.44	1.65	0.41	5.04	1.76	2.01	0.50	6.19	2.17	2.48	0.62	7.91	2.77	3.17	0.79
1305	0.94	7.07	2.48	2.83	0.71	2.74	0.96	1.09	0.27	4.13	1.45	1.65	0.41	5.05	1.77	2.02	0.50	6.21	2.17	2.48	0.62	7.94	2.78	3.17	0.79
1310	0.95	7.09	2.48	2.84	0.71	2.74	0.96	1.10	0.27	4.14	1.45	1.66	0.41	5.06	1.77	2.03	0.51	6.23	2.18	2.49	0.62	7.96	2.78	3.18	0.80
1315	0.95	7.11	2.49	2.84	0.71	2.75	0.96	1.10	0.28	4.15	1.45	1.66	0.42	5.08	1.78	2.03	0.51	6.24	2.18	2.50	0.62	7.98	2.79	3.19	0.80
1320	0.95	7.13	2.49	2.85	0.71	2.76	0.97	1.10	0.28	4.16	1.46	1.66	0.42	5.09	1.78	2.04	0.51	6.26	2.19	2.50	0.63	8.00	2.80	3.20	0.80
1325	0.95	7.14	2.50	2.86	0.71	2.77	0.97	1.11	0.28	4.17	1.46	1.67	0.42	5.10	1.79	2.04	0.51	6.27	2.20	2.51	0.63	8.02	2.81	3.21	0.80
1330	0.95	7.16	2.51	2.86	0.72	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.11	1.79	2.05	0.51	6.29	2.20	2.52	0.63	8.04	2.81	3.21	0.80
1335	0.96	7.18	2.51	2.87	0.72	2.78	0.97	1.11	0.28	4.19	1.47	1.68	0.42	5.13	1.79	2.05	0.51	6.30	2.21	2.52	0.63	8.06	2.82	3.22	0.81
1340	0.96	7.20	2.52	2.88	0.72	2.79	0.97	1.11	0.28	4.20	1.47	1.68	0.42	5.14	1.80	2.06	0.51	6.32	2.21	2.53	0.63	8.07	2.83	3.23	0.81
1345	0.96	7.21	2.52	2.89	0.72	2.79	0.98	1.12	0.28	4.21	1.47	1.69	0.42	5.15	1.80	2.06	0.52	6.33	2.22	2.53	0.63	8.09	2.83	3.24	0.81
1350	0.96	7.23	2.53	2.89	0.72	2.80	0.98	1.12	0.28	4.22	1.48	1.69	0.42	5.16	1.81	2.06	0.52	6.35	2.22	2.54	0.63	8.11	2.84	3.24	0.81
1355	0.97	7.25	2.54	2.90	0.72	2.80	0.98	1.12	0.28	4.23	1.48	1.69	0.42	5.17	1.81	2.07	0.52	6.36	2.23	2.54	0.64	8.13	2.85	3.25	0.81
1360	0.97	7.26	2.54	2.90	0.73	2.81	0.98	1.12	0.28	4.24	1.48	1.70	0.42	5.19	1.81	2.07	0.52	6.38	2.23	2.55	0.64	8.15	2.85	3.26	0.81
1365	0.97	7.28	2.55	2.91	0.73	2.82	0.99	1.13	0.28	4.25	1.49	1.70	0.43	5.20	1.82	2.08	0.52	6.39	2.24	2.56	0.64	8.17	2.86	3.27	0.82
1370	0.97	7.29	2.55	2.92	0.73	2.82	0.99	1.13	0.28	4.26	1.49	1.70	0.43	5.21	1.82	2.08	0.52	6.40	2.24	2.56	0.64	8.18	2.86	3.27	0.82
1375	0.97	7.31	2.56	2.92	0.73	2.83	0.99	1.13	0.28	4.27	1.49	1.71	0.43	5.22	1.83	2.09	0.52	6.42	2.25	2.57	0.64	8.20	2.87	3.28	0.82
1380	0.98	7.33	2.56	2.93	0.73	2.83	0.99	1.13	0.28	4.28	1.50	1.71	0.43	5.23	1.83	2.09	0.52	6.43	2.25	2.57	0.64	8.22	2.88	3.29	0.82
1385	0.98	7.34	2.57	2.94	0.73	2.84	0.99	1.14	0.28	4.29	1.50	1.71	0.43	5.24	1.83	2.10	0.52	6.45	2.26	2.58	0.64	8.24	2.88	3.29	0.82
1390	0.98	7.36	2.57	2.94	0.74	2.85	1.00	1.14	0.28	4.30	1.50	1.72	0.43	5.25	1.84	2.10	0.53	6.46	2.26	2.58	0.65	8.25	2.89	3.30	0.83
1395	0.98	7.37	2.58	2.95	0.74	2.85	1.00	1.14	0.29	4.30	1.51	1.72	0.43	5.26	1.84	2.11	0.53	6.47	2.27	2.59	0.65	8.27	2.89	3.31	0.83
1400	0.98	7.39	2.58	2.95	0.74	2.86	1.00	1.14	0.29	4.31	1.51	1.73	0.43	5.27	1.85	2.11	0.53	6.48	2.27	2.59	0.65	8.29	2.90	3.31	0.83
1405	0.99	7.40	2.59	2.96	0.74	2.86	1.00	1.15	0.29	4.32	1.51	1.73	0.43	5.28	1.85	2.11	0.53	6.50	2.27	2.60	0.65	8.30	2.91	3.32	0.83
1410	0.99	7.42	2.60	2.97	0.74	2.87	1.00	1.15	0.29	4.33	1.52	1.73	0.43	5.29	1.85	2.12	0.53	6.51	2.28	2.60	0.65	8.32	2.91	3.33	0.83
1415	0.99	7.43	2.60	2.97	0.74	2.88	1.01	1.15	0.29	4.34	1.52	1.74	0.43	5.30	1.86	2.12	0.53	6.52	2.28	2.61	0.65	8.34	2.92	3.33	0.83
1420	0.99	7.44	2.61	2.98	0.74	2.88	1.01	1.15	0.29	4.35	1.52	1.74	0.43	5.31	1.86	2.13	0.53	6.54	2.29	2.61	0.65	8.35	2.92	3.34	0.84
1425	0.99	7.46	2.61	2.98	0.75	2.89	1.01	1.15	0.29	4.36	1.52	1.74	0.44	5.33	1.86	2.13	0.53	6.55	2.29	2.62	0.65	8.37	2.93	3.35	0.84
1430	1.00	7.47	2.62	2.99	0.75	2.89	1.01	1.16	0.29	4.36	1.53	1.75	0.44	5.34	1.87	2.13	0.53	6.56	2.30	2.62	0.66	8.38	2.93	3.35	0.84
1435	1.00	7.49	2.62	2.99	0.75	2.90	1.01	1.16	0.29	4.37	1.53	1.75	0.44	5.35	1.87	2.14	0.53	6.57	2.30	2.63	0.66	8.40	2.94	3.36	0.84
1440	1.00	7.50	2.63	3.00	0.75	2.90	1.02	1.16	0.29	4.38	1.53	1.75	0.44	5.36	1.87	2.14	0.54	6.59	2.30	2.63	0.66	8.42	2.95	3.37	0.84

SUBAREA A4 HYETOPRAPHS

- Per 2006 Los Angeles County Hydrology Manual Appendix A

24 HR ISOHYETS,IN					
50 YR	2 YR	5 YR	10 YR	25 YR	100 YR
7.4	2.9	4.3	5.3	6.5	8.3



UNIT HYETOGRAPH		50 YR - 24 HR					2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
30	0.01	0.08	0.03	0.03	0.01	0.03	0.01	0.01	0.00	0.05	0.02	0.02	0.00	0.06	0.02	0.02	0.01	0.07	0.03	0.03	0.01	0.09	0.03	0.04	0.01	
60	0.02	0.17	0.06	0.07	0.02	0.06	0.02	0.03	0.01	0.10	0.03	0.04	0.01	0.12	0.04	0.05	0.01	0.15	0.05	0.06	0.01	0.19	0.06	0.07	0.02	
90	0.03	0.25	0.09	0.10	0.02	0.10	0.03	0.04	0.01	0.15	0.05	0.06	0.01	0.18	0.06	0.07	0.02	0.22	0.08	0.09	0.02	0.28	0.10	0.11	0.03	
120	0.05	0.34	0.12	0.13	0.03	0.13	0.05	0.05	0.01	0.20	0.07	0.08	0.02	0.24	0.08	0.10	0.02	0.29	0.10	0.12	0.03	0.38	0.13	0.15	0.04	
150	0.06	0.42	0.15	0.17	0.04	0.16	0.06	0.07	0.02	0.25	0.09	0.10	0.02	0.30	0.11	0.12	0.03	0.37	0.13	0.15	0.04	0.47	0.17	0.19	0.05	
180	0.07	0.51	0.18	0.20	0.05	0.20	0.07	0.08	0.02	0.30	0.10	0.12	0.03	0.36	0.13	0.15	0.04	0.45	0.16	0.18	0.04	0.57	0.20	0.23	0.06	
210	0.08	0.60	0.21	0.24	0.06	0.23	0.08	0.09	0.02	0.35	0.12	0.14	0.03	0.43	0.15	0.17	0.04	0.53	0.18	0.21	0.05	0.67	0.24	0.27	0.07	
240	0.09	0.69	0.24	0.28	0.07	0.27	0.09	0.11	0.03	0.40	0.14	0.16	0.04	0.49	0.17	0.20	0.05	0.61	0.21	0.24	0.06	0.77	0.27	0.31	0.08	
270	0.11	0.78	0.27	0.31	0.08	0.30	0.11	0.12	0.03	0.46	0.16	0.18	0.05	0.56	0.20	0.22	0.06	0.69	0.24	0.27	0.07	0.88	0.31	0.35	0.09	
300	0.12	0.87	0.31	0.35	0.09	0.34	0.12	0.14	0.03	0.51	0.18	0.20	0.05	0.62	0.22	0.25	0.06	0.77	0.27	0.31	0.08	0.98	0.34	0.39	0.10	
330	0.13	0.97	0.34	0.39	0.10	0.38	0.13	0.15	0.04	0.57	0.20	0.23	0.06	0.69	0.24	0.28	0.07	0.85	0.30	0.34	0.09	1.09	0.38	0.44	0.11	
360	0.14	1.07	0.37	0.43	0.11	0.41	0.14	0.17	0.04	0.62	0.22	0.25	0.06	0.76	0.27	0.30	0.08	0.94	0.33	0.37	0.09	1.20	0.42	0.48	0.12	
390	0.16	1.16	0.41	0.47	0.12	0.45	0.16	0.18	0.05	0.68	0.24	0.27	0.07	0.83	0.29	0.33	0.08	1.02	0.36	0.41	0.10	1.31	0.46	0.52	0.13	
420	0.17	1.26	0.44	0.51	0.13	0.49	0.17	0.20	0.05	0.74	0.26	0.30	0.07	0.90	0.32	0.36	0.09	1.11	0.39	0.44	0.11	1.42	0.50	0.57	0.14	
450	0.18	1.37	0.48	0.55	0.14	0.53	0.19	0.21	0.05	0.80	0.28	0.32	0.08	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.53	0.54	0.61	0.15	

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
480	0.20	1.47	0.51	0.59	0.15	0.57	0.20	0.23	0.06	0.86	0.30	0.34	0.09	1.05	0.37	0.42	0.11	1.29	0.45	0.52	0.13	1.65	0.58	0.66	0.17
510	0.21	1.58	0.55	0.63	0.16	0.61	0.21	0.24	0.06	0.92	0.32	0.37	0.09	1.13	0.39	0.45	0.11	1.38	0.48	0.55	0.14	1.77	0.62	0.71	0.18
540	0.23	1.69	0.59	0.67	0.17	0.65	0.23	0.26	0.07	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.48	0.52	0.59	0.15	1.89	0.66	0.76	0.19
570	0.24	1.80	0.63	0.72	0.18	0.70	0.24	0.28	0.07	1.05	0.37	0.42	0.10	1.28	0.45	0.51	0.13	1.58	0.55	0.63	0.16	2.02	0.71	0.81	0.20
600	0.26	1.91	0.67	0.76	0.19	0.74	0.26	0.30	0.07	1.12	0.39	0.45	0.11	1.36	0.48	0.55	0.14	1.68	0.59	0.67	0.17	2.14	0.75	0.86	0.21
630	0.27	2.03	0.71	0.81	0.20	0.79	0.27	0.31	0.08	1.18	0.41	0.47	0.12	1.45	0.51	0.58	0.14	1.78	0.62	0.71	0.18	2.28	0.80	0.91	0.23
660	0.29	2.15	0.75	0.86	0.21	0.83	0.29	0.33	0.08	1.25	0.44	0.50	0.13	1.53	0.54	0.61	0.15	1.89	0.66	0.75	0.19	2.41	0.84	0.96	0.24
690	0.31	2.27	0.80	0.91	0.23	0.88	0.31	0.35	0.09	1.33	0.46	0.53	0.13	1.62	0.57	0.65	0.16	2.00	0.70	0.80	0.20	2.55	0.89	1.02	0.25
720	0.32	2.40	0.84	0.96	0.24	0.93	0.33	0.37	0.09	1.40	0.49	0.56	0.14	1.71	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.69	0.94	1.08	0.27
750	0.34	2.53	0.89	1.01	0.25	0.98	0.34	0.39	0.10	1.48	0.52	0.59	0.15	1.81	0.63	0.72	0.18	2.22	0.78	0.89	0.22	2.84	0.99	1.14	0.28
780	0.36	2.67	0.93	1.07	0.27	1.03	0.36	0.41	0.10	1.56	0.55	0.62	0.16	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.99	1.05	1.20	0.30
810	0.38	2.81	0.98	1.12	0.28	1.09	0.38	0.43	0.11	1.64	0.57	0.66	0.16	2.01	0.70	0.80	0.20	2.47	0.86	0.99	0.25	3.15	1.10	1.26	0.32
840	0.40	2.96	1.04	1.18	0.30	1.14	0.40	0.46	0.11	1.73	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.60	0.91	1.04	0.26	3.32	1.16	1.33	0.33
870	0.42	3.11	1.09	1.24	0.31	1.20	0.42	0.48	0.12	1.82	0.64	0.73	0.18	2.22	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.49	1.22	1.40	0.35
900	0.44	3.27	1.15	1.31	0.33	1.27	0.44	0.51	0.13	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.88	1.01	1.15	0.29	3.67	1.29	1.47	0.37
930	0.47	3.45	1.21	1.38	0.34	1.33	0.47	0.53	0.13	2.01	0.70	0.81	0.20	2.46	0.86	0.98	0.25	3.03	1.06	1.21	0.30	3.87	1.35	1.55	0.39
960	0.49	3.63	1.27	1.45	0.36	1.40	0.49	0.56	0.14	2.12	0.74	0.85	0.21	2.59	0.91	1.04	0.26	3.19	1.12	1.27	0.32	4.07	1.43	1.63	0.41
970	0.50	3.69	1.29	1.48	0.37	1.43	0.50	0.57	0.14	2.16	0.75	0.86	0.22	2.64	0.92	1.05	0.26	3.24	1.14	1.30	0.32	4.14	1.45	1.66	0.41
980	0.51	3.76	1.32	1.50	0.38	1.45	0.51	0.58	0.15	2.20	0.77	0.88	0.22	2.68	0.94	1.07	0.27	3.30	1.16	1.32	0.33	4.22	1.48	1.69	0.42
990	0.52	3.83	1.34	1.53	0.38	1.48	0.52	0.59	0.15	2.23	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.36	1.18	1.34	0.34	4.29	1.50	1.72	0.43
1000	0.53	3.90	1.36	1.56	0.39	1.51	0.53	0.60	0.15	2.28	0.80	0.91	0.23	2.78	0.97	1.11	0.28	3.42	1.20	1.37	0.34	4.37	1.53	1.75	0.44
1010	0.54	3.97	1.39	1.59	0.40	1.54	0.54	0.61	0.15	2.32	0.81	0.93	0.23	2.83	0.99	1.13	0.28	3.48	1.22	1.39	0.35	4.45	1.56	1.78	0.45
1020	0.55	4.04	1.41	1.62	0.40	1.56	0.55	0.63	0.16	2.36	0.83	0.94	0.24	2.89	1.01	1.15	0.29	3.55	1.24	1.42	0.35	4.54	1.59	1.81	0.45
1030	0.56	4.12	1.44	1.65	0.41	1.59	0.56	0.64	0.16	2.41	0.84	0.96	0.24	2.94	1.03	1.18	0.29	3.62	1.27	1.45	0.36	4.62	1.62	1.85	0.46
1040	0.57	4.20	1.47	1.68	0.42	1.62	0.57	0.65	0.16	2.45	0.86	0.98	0.25	3.00	1.05	1.20	0.30	3.69	1.29	1.47	0.37	4.71	1.65	1.88	0.47
1050	0.58	4.28	1.50	1.71	0.43	1.66	0.58	0.66	0.17	2.50	0.88	1.00	0.25	3.06	1.07	1.22	0.31	3.76	1.32	1.50	0.38	4.80	1.68	1.92	0.48
1060	0.59	4.37	1.53	1.75	0.44	1.69	0.59	0.68	0.17	2.55	0.89	1.02	0.26	3.12	1.09	1.25	0.31	3.84	1.34	1.53	0.38	4.90	1.72	1.96	0.49
1070	0.60	4.46	1.56	1.78	0.45	1.73	0.60	0.69	0.17	2.61	0.91	1.04	0.26	3.19	1.11	1.27	0.32	3.92	1.37	1.57	0.39	5.01	1.75	2.00	0.50
1080	0.62	4.56	1.60	1.82	0.46	1.76	0.62	0.71	0.18	2.66	0.93	1.06	0.27	3.25	1.14	1.30	0.33	4.00	1.40	1.60	0.40	5.11	1.79	2.05	0.51
1090	0.63	4.66	1.63	1.86	0.47	1.80	0.63	0.72	0.18	2.72	0.95	1.09	0.27	3.33	1.17	1.33	0.33	4.09	1.43	1.64	0.41	5.23	1.83	2.09	0.52
1100	0.65	4.77	1.67	1.91	0.48	1.85	0.65	0.74	0.18	2.79	0.98	1.12	0.28	3.41	1.19	1.36	0.34	4.19	1.47	1.68	0.42	5.36	1.87	2.14	0.54
1110	0.66	4.90	1.71	1.96	0.49	1.89	0.66	0.76	0.19	2.86	1.00	1.14	0.29	3.50	1.22	1.40	0.35	4.30	1.50	1.72	0.43	5.49	1.92	2.20	0.55
1115	0.67	4.96	1.74	1.99	0.50	1.92	0.67	0.77	0.19	2.90	1.01	1.16	0.29	3.54	1.24	1.42	0.35	4.36	1.53	1.74	0.44	5.57	1.95	2.23	0.56
1120	0.68	5.03	1.76	2.01	0.50	1.95	0.68	0.78	0.19	2.94	1.03	1.18	0.29	3.59	1.26	1.44	0.36	4.42	1.55	1.77	0.44	5.65	1.98	2.26	0.56
1125	0.69	5.11	1.79	2.04	0.51	1.98	0.69	0.79	0.20	2.98	1.04	1.19	0.30	3.65	1.28	1.46	0.36	4.49	1.57	1.79	0.45	5.73	2.01	2.29	0.57
1130	0.70	5.19	1.82	2.08	0.52	2.01	0.70	0.80	0.20	3.03	1.06	1.21	0.30	3.71	1.30	1.48	0.37	4.56	1.60	1.82	0.46	5.83	2.04	2.33	0.58
1135	0.71	5.29	1.85	2.11	0.53	2.05	0.72	0.82	0.20	3.09	1.08	1.23	0.31	3.77	1.32	1.51	0.38	4.64	1.62	1.86	0.46	5.93	2.08	2.37	0.59
1136	0.72	5.31	1.86	2.12	0.53	2.05	0.72	0.82	0.21	3.10	1.08	1.24	0.31	3.79	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.95	2.08	2.38	0.60
1137	0.72	5.33	1.86	2.13	0.53	2.06	0.72	0.82	0.21	3.11	1.09	1.24	0.31	3.80	1.33	1.52	0.38	4.68	1.64	1.87	0.47	5.98	2.09	2.39	0.60
1138	0.72	5.35	1.87	2.14	0.53	2.07	0.72	0.83	0.21	3.12	1.09	1.25	0.31	3.82	1.34	1.53	0.38	4.70	1.64	1.88	0.47	6.00	2.10	2.40	0.60
1139	0.73	5.37	1.88	2.15	0.54	2.08	0.73	0.83	0.21	3.14	1.10	1.25	0.31	3.83	1.34	1.53	0.38	4.72	1.65	1.89	0.47	6.03	2.11	2.41	0.60
1140	0.73	5.39	1.89	2.16	0.54	2.09	0.73	0.83	0.21	3.15	1.10	1.26	0.31	3.85	1.35	1.54	0.39	4.74	1.66	1.89	0.47	6.05	2.12	2.42	0.61
1145	0.75	5.52	1.93	2.21	0.55	2.14	0.75	0.86	0.21	3.23	1.13	1.29	0.32	3.94	1.38	1.58	0.39	4.85	1.70	1.94	0.49	6.20	2.17	2.48	0.62
1150	0.77	5.72	2.00	2.29	0.57	2.21	0.77	0.88	0.22	3.34	1.17	1.34	0.33	4.08	1.43	1.63	0.41	5.02	1.76	2.01	0.50	6.41	2.24	2.57	0.64
1151	0.78	5.78	2.02	2.31	0.58	2.24	0.78	0.89	0.22	3.37	1.18	1.35	0.34	4.13	1.44	1.65	0.41	5.07	1.78	2.03	0.51	6.48	2.27	2.59	0.65
1152	0.80	5.92	2.07	2.37	0.59	2.29	0.80	0.92	0.23	3.46	1.21	1.38	0.35	4.23	1.48	1.69	0.42	5.20	1.82	2.08	0.52	6.64	2.32	2.66	0.66
1153	0.81	5.99	2.10	2.40	0.60	2.32	0.81	0.93	0.23	3.50	1.23	1.40	0.35	4.28	1.50	1.71	0.43	5.26	1.84	2.10	0.53	6.72	2.35	2.69	0.67
1154	0.81	6.03	2.11	2.41	0.60	2.33	0.82	0.93	0.23	3.52	1.23	1.41	0.35	4.30	1.51	1.72	0.43	5.29	1.85	2.12	0.53	6.76	2.37	2.70	0.68
1155	0.82	6.05	2.12	2.42	0.61	2.34	0.82	0.94	0.23	3.53	1.24	1.41	0.35	4.32	1.51	1.73	0.43	5.31	1.86	2.13	0.53	6.79	2.38	2.72	0.68
1156	0.82	6.07																							

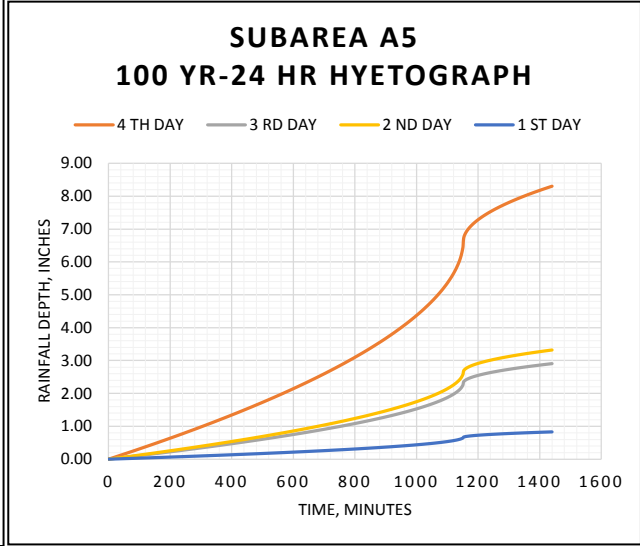
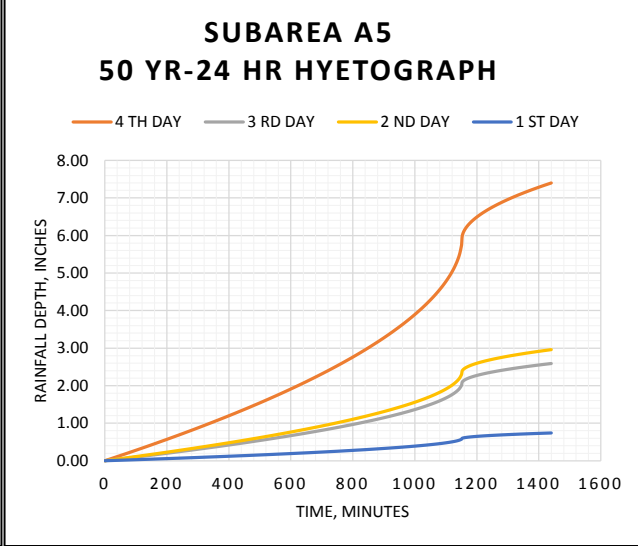
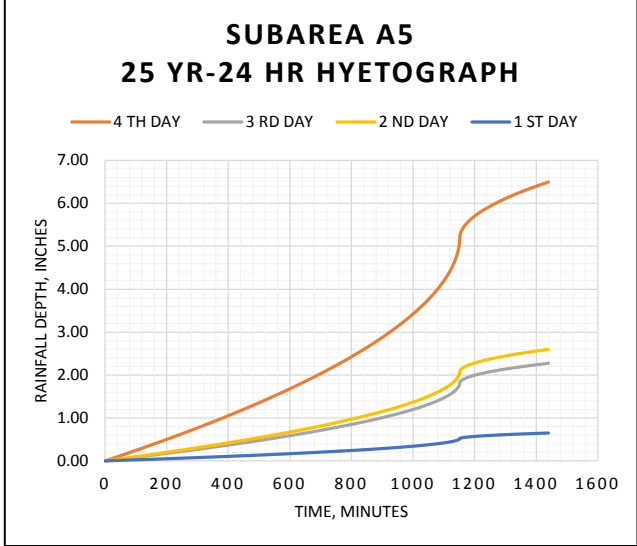
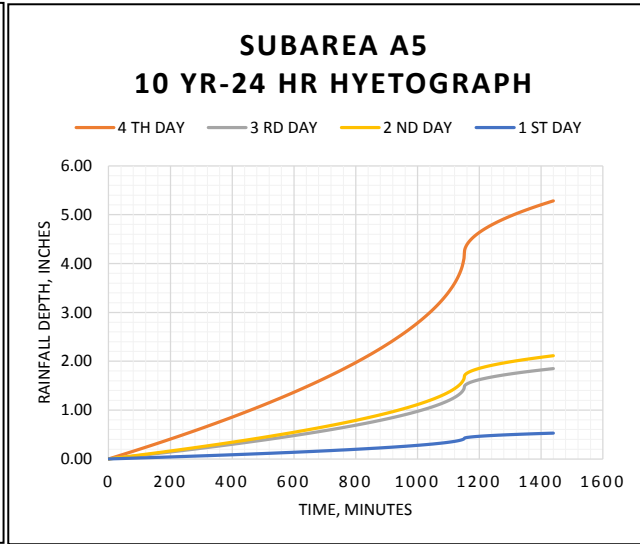
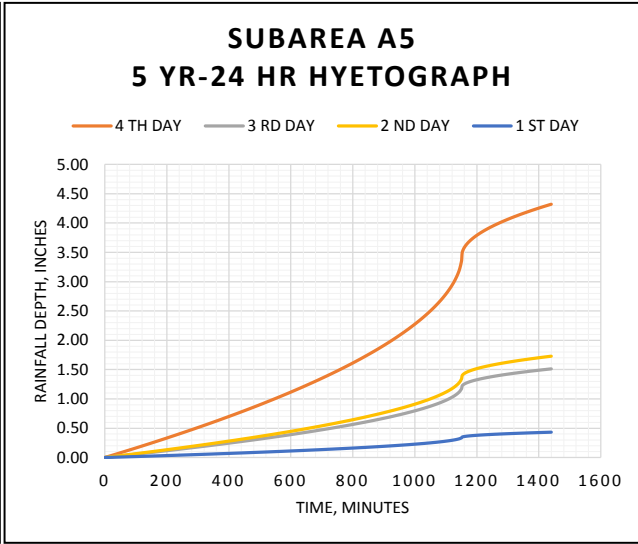
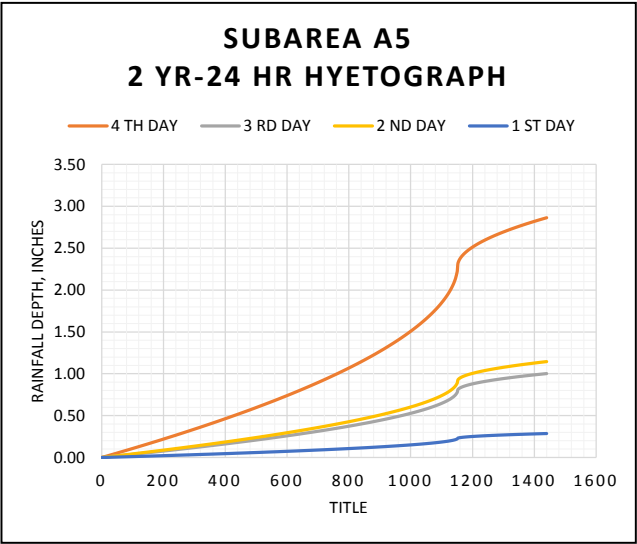
UNIT HYTEOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1170	0.85	6.26	2.19	2.50	0.63	2.42	0.85	0.97	0.24	3.66	1.28	1.46	0.37	4.47	1.56	1.79	0.45	5.50	1.92	2.20	0.55	7.02	2.46	2.81	0.70
1171	0.85	6.27	2.19	2.51	0.63	2.43	0.85	0.97	0.24	3.66	1.28	1.46	0.37	4.48	1.57	1.79	0.45	5.51	1.93	2.20	0.55	7.04	2.46	2.81	0.70
1172	0.85	6.28	2.20	2.51	0.63	2.43	0.85	0.97	0.24	3.67	1.28	1.47	0.37	4.48	1.57	1.79	0.45	5.51	1.93	2.21	0.55	7.05	2.47	2.82	0.70
1173	0.85	6.29	2.20	2.52	0.63	2.43	0.85	0.97	0.24	3.67	1.29	1.47	0.37	4.49	1.57	1.80	0.45	5.52	1.93	2.21	0.55	7.06	2.47	2.82	0.71
1174	0.85	6.30	2.20	2.52	0.63	2.44	0.85	0.98	0.24	3.68	1.29	1.47	0.37	4.50	1.57	1.80	0.45	5.53	1.94	2.21	0.55	7.07	2.47	2.83	0.71
1175	0.85	6.31	2.21	2.52	0.63	2.44	0.85	0.98	0.24	3.68	1.29	1.47	0.37	4.50	1.58	1.80	0.45	5.54	1.94	2.22	0.55	7.08	2.48	2.83	0.71
1176	0.85	6.32	2.21	2.53	0.63	2.44	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.51	1.58	1.80	0.45	5.55	1.94	2.22	0.55	7.09	2.48	2.83	0.71
1177	0.85	6.33	2.21	2.53	0.63	2.45	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.55	1.94	2.22	0.56	7.10	2.48	2.84	0.71
1178	0.86	6.33	2.22	2.53	0.63	2.45	0.86	0.98	0.25	3.70	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.56	1.95	2.22	0.56	7.11	2.49	2.84	0.71
1179	0.86	6.34	2.22	2.54	0.63	2.45	0.86	0.98	0.25	3.70	1.30	1.48	0.37	4.53	1.58	1.81	0.45	5.57	1.95	2.23	0.56	7.12	2.49	2.85	0.71
1180	0.86	6.35	2.22	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.53	1.59	1.81	0.45	5.58	1.95	2.23	0.56	7.13	2.49	2.85	0.71
1181	0.86	6.36	2.23	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.49	0.37	4.54	1.59	1.82	0.45	5.58	1.95	2.23	0.56	7.13	2.50	2.85	0.71
1182	0.86	6.37	2.23	2.55	0.64	2.46	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.45	5.59	1.96	2.24	0.56	7.14	2.50	2.86	0.71
1183	0.86	6.37	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.15	2.50	2.86	0.72
1184	0.86	6.38	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.73	1.30	1.49	0.37	4.56	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.16	2.51	2.86	0.72
1185	0.86	6.39	2.24	2.56	0.64	2.47	0.87	0.99	0.25	3.73	1.31	1.49	0.37	4.56	1.60	1.82	0.46	5.61	1.96	2.24	0.56	7.17	2.51	2.87	0.72
1186	0.86	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.49	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.18	2.51	2.87	0.72
1187	0.87	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.19	2.51	2.87	0.72
1188	0.87	6.41	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.63	1.97	2.25	0.56	7.19	2.52	2.88	0.72
1189	0.87	6.42	2.25	2.57	0.64	2.48	0.87	0.99	0.25	3.75	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.64	1.97	2.25	0.56	7.20	2.52	2.88	0.72
1190	0.87	6.43	2.25	2.57	0.64	2.49	0.87	0.99	0.25	3.75	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.64	1.97	2.26	0.56	7.21	2.52	2.88	0.72
1191	0.87	6.43	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.76	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.65	1.98	2.26	0.56	7.22	2.53	2.89	0.72
1192	0.87	6.44	2.25	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.50	0.38	4.60	1.61	1.84	0.46	5.65	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1193	0.87	6.45	2.26	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.51	0.38	4.60	1.61	1.84	0.46	5.66	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1194	0.87	6.45	2.26	2.58	0.65	2.50	0.87	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.84	0.46	5.67	1.98	2.27	0.57	7.24	2.53	2.90	0.72
1195	0.87	6.46	2.26	2.58	0.65	2.50	0.88	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.85	0.46	5.67	1.99	2.27	0.57	7.25	2.54	2.90	0.72
1196	0.87	6.47	2.26	2.59	0.65	2.50	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.90	0.73
1197	0.87	6.47	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.91	0.73
1198	0.88	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.27	2.54	2.91	0.73
1199	0.88	6.49	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.52	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.28	2.55	2.91	0.73
1200	0.88	6.49	2.27	2.60	0.65	2.51	0.88	1.01	0.25	3.79	1.33	1.52	0.38	4.64	1.62	1.85	0.46	5.70	2.00	2.28	0.57	7.28	2.55	2.91	0.73
1201	0.88	6.50	2.27	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.62	1.86	0.46	5.71	2.00	2.28	0.57	7.29	2.55	2.92	0.73
1202	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.63	1.86	0.46	5.71	2.00	2.28	0.57	7.30	2.55	2.92	0.73
1203	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.65	1.63	1.86	0.46	5.72	2.00	2.29	0.57	7.31	2.56	2.92	0.73
1204	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.65	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.31	2.56	2.93	0.73
1205	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.73	2.00	2.29	0.57	7.32	2.56	2.93	0.73
1206	0.88	6.53	2.29	2.61	0.65	2.53	0.88	1.01	0.25	3.81	1.33	1.53	0.38	4.66	1.63	1.86	0.47	5.73	2.01	2.29	0.57	7.33	2.56	2.93	0.73
1207	0.88	6.54	2.29	2.61	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.33	2.57	2.93	0.73
1208	0.88	6.54	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.34	2.57	2.94	0.73
1209	0.88	6.55	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.64	1.87	0.47	5.75	2.01	2.30	0.57	7.35	2.57	2.94	0.73
1210	0.89	6.55	2.29	2.62	0.66	2.54	0.89	1.01	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.75	2.01	2.30	0.58	7.35	2.57	2.94	0.74
1211	0.89	6.56	2.30	2.62	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.76	2.02	2.30	0.58	7.36	2.58	2.94	0.74
1212	0.89	6.56	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.69	1.64	1.87	0.47	5.76	2.02	2.31	0.58	7.37	2.58	2.95	0.74
1213	0.89	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.53	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.37	2.58	2.95	0.74
1214	0.89	6.58	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.54	0.38	4.70	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.38	2.58	2.95	0.74
1215	0.89	6.58	2.30	2.63	0.66	2.55	0.89	1.02	0.25	3.84	1.35	1.54	0.38	4.70	1.64	1.88	0.47	5.78	2.02	2.31	0.58	7.38	2.58	2.95	0.74
1216	0.89	6.59	2.31	2.63	0.66	2.55	0.89	1.02	0.25	3.85	1.35	1.54	0.38	4.70	1.65	1.88	0.47	5.78	2.02	2.31	0.58	7.39	2.59	2.96	0.74
1217	0.89	6.59	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.38	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1218	0.89	6.60	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.39	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1219	0.89	6.60	2.31	2.64	0.66	2.56	0.89	1.02	0.26	3.86	1.35	1.54	0.39	4.71	1.65	1.89	0.47	5.80	2.03	2.32	0.58	7.41	2.59	2.96	0.74

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1233	0.90	6.68	2.34	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.77	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.49	2.62	3.00	0.75
1234	0.90	6.68	2.34	2.67	0.67	2.59	0.90	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.62	3.00	0.75
1235	0.90	6.69	2.34	2.67	0.67	2.59	0.91	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.63	3.00	0.75
1240	0.91	6.71	2.35	2.68	0.67	2.60	0.91	1.04	0.26	3.92	1.37	1.57	0.39	4.79	1.68	1.92	0.48	5.89	2.06	2.36	0.59	7.53	2.63	3.01	0.75
1245	0.91	6.73	2.36	2.69	0.67	2.61	0.91	1.04	0.26	3.93	1.38	1.57	0.39	4.81	1.68	1.92	0.48	5.91	2.07	2.36	0.59	7.55	2.64	3.02	0.76
1250	0.91	6.76	2.36	2.70	0.68	2.61	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.08	2.37	0.59	7.58	2.65	3.03	0.76
1255	0.92	6.78	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.96	1.39	1.58	0.40	4.84	1.69	1.94	0.48	5.95	2.08	2.38	0.60	7.61	2.66	3.04	0.76
1260	0.92	6.80	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.86	1.70	1.94	0.49	5.97	2.09	2.39	0.60	7.63	2.67	3.05	0.76
1265	0.92	6.82	2.39	2.73	0.68	2.64	0.92	1.06	0.26	3.98	1.39	1.59	0.40	4.87	1.70	1.95	0.49	5.99	2.10	2.40	0.60	7.65	2.68	3.06	0.77
1270	0.92	6.84	2.39	2.74	0.68	2.65	0.93	1.06	0.26	4.00	1.40	1.60	0.40	4.89	1.71	1.95	0.49	6.01	2.10	2.40	0.60	7.68	2.69	3.07	0.77
1275	0.93	6.86	2.40	2.75	0.69	2.66	0.93	1.06	0.27	4.01	1.40	1.60	0.40	4.90	1.72	1.96	0.49	6.03	2.11	2.41	0.60	7.70	2.70	3.08	0.77
1280	0.93	6.88	2.41	2.75	0.69	2.66	0.93	1.07	0.27	4.02	1.41	1.61	0.40	4.91	1.72	1.97	0.49	6.04	2.12	2.42	0.60	7.72	2.70	3.09	0.77
1285	0.93	6.90	2.42	2.76	0.69	2.67	0.93	1.07	0.27	4.03	1.41	1.61	0.40	4.93	1.72	1.97	0.49	6.06	2.12	2.42	0.61	7.74	2.71	3.10	0.77
1290	0.94	6.92	2.42	2.77	0.69	2.68	0.94	1.07	0.27	4.04	1.41	1.62	0.40	4.94	1.73	1.98	0.49	6.08	2.13	2.43	0.61	7.77	2.72	3.11	0.78
1295	0.94	6.94	2.43	2.78	0.69	2.69	0.94	1.07	0.27	4.05	1.42	1.62	0.41	4.96	1.73	1.98	0.50	6.09	2.13	2.44	0.61	7.79	2.73	3.12	0.78
1300	0.94	6.96	2.44	2.78	0.70	2.69	0.94	1.08	0.27	4.06	1.42	1.63	0.41	4.97	1.74	1.99	0.50	6.11	2.14	2.44	0.61	7.81	2.73	3.12	0.78
1305	0.94	6.98	2.44	2.79	0.70	2.70	0.95	1.08	0.27	4.08	1.43	1.63	0.41	4.98	1.74	1.99	0.50	6.13	2.14	2.45	0.61	7.83	2.74	3.13	0.78
1310	0.95	7.00	2.45	2.80	0.70	2.71	0.95	1.08	0.27	4.09	1.43	1.63	0.41	5.00	1.75	2.00	0.50	6.14	2.15	2.46	0.61	7.85	2.75	3.14	0.79
1315	0.95	7.01	2.46	2.81	0.70	2.71	0.95	1.09	0.27	4.10	1.43	1.64	0.41	5.01	1.75	2.00	0.50	6.16	2.16	2.46	0.62	7.87	2.75	3.15	0.79
1320	0.95	7.03	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.11	1.44	1.64	0.41	5.02	1.76	2.01	0.50	6.17	2.16	2.47	0.62	7.89	2.76	3.16	0.79
1325	0.95	7.05	2.47	2.82	0.70	2.73	0.95	1.09	0.27	4.12	1.44	1.65	0.41	5.03	1.76	2.01	0.50	6.19	2.17	2.48	0.62	7.91	2.77	3.16	0.79
1330	0.95	7.07	2.47	2.83	0.71	2.73	0.96	1.09	0.27	4.13	1.44	1.65	0.41	5.05	1.77	2.02	0.50	6.20	2.17	2.48	0.62	7.93	2.78	3.17	0.79
1335	0.96	7.08	2.48	2.83	0.71	2.74	0.96	1.10	0.27	4.14	1.45	1.65	0.41	5.06	1.77	2.02	0.51	6.22	2.18	2.49	0.62	7.95	2.78	3.18	0.79
1340	0.96	7.10	2.49	2.84	0.71	2.75	0.96	1.10	0.27	4.15	1.45	1.66	0.41	5.07	1.77	2.03	0.51	6.23	2.18	2.49	0.62	7.97	2.79	3.19	0.80
1345	0.96	7.12	2.49	2.85	0.71	2.75	0.96	1.10	0.28	4.16	1.45	1.66	0.42	5.08	1.78	2.03	0.51	6.25	2.19	2.50	0.62	7.99	2.79	3.19	0.80
1350	0.96	7.13	2.50	2.85	0.71	2.76	0.97	1.10	0.28	4.17	1.46	1.67	0.42	5.09	1.78	2.04	0.51	6.26	2.19	2.51	0.63	8.00	2.80	3.20	0.80
1355	0.97	7.15	2.50	2.86	0.71	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.10	1.79	2.04	0.51	6.28	2.20	2.51	0.63	8.02	2.81	3.21	0.80
1360	0.97	7.17	2.51	2.87	0.72	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.12	1.79	2.05	0.51	6.29	2.20	2.52	0.63	8.04	2.81	3.22	0.80
1365	0.97	7.18	2.51	2.87	0.72	2.78	0.97	1.11	0.28	4.19	1.47	1.68	0.42	5.13	1.79	2.05	0.51	6.31	2.21	2.52	0.63	8.06	2.82	3.22	0.81
1370	0.97	7.20	2.52	2.88	0.72	2.79	0.97	1.11	0.28	4.20	1.47	1.68	0.42	5.14	1.80	2.06	0.51	6.32	2.21	2.53	0.63	8.07	2.83	3.23	0.81
1375	0.97	7.21	2.52	2.88	0.72	2.79	0.98	1.12	0.28	4.21	1.47	1.68	0.42	5.15	1.80	2.06	0.51	6.33	2.22	2.53	0.63	8.09	2.83	3.24	0.81
1380	0.98	7.23	2.53	2.89	0.72	2.80	0.98	1.12	0.28	4.22	1.48	1.69	0.42	5.16	1.81	2.06	0.52	6.35	2.22	2.54	0.63	8.11	2.84	3.24	0.81
1385	0.98	7.24	2.53	2.90	0.72	2.80	0.98	1.12	0.28	4.23	1.48	1.69	0.42	5.17	1.81	2.07	0.52	6.36	2.23	2.54	0.64	8.13	2.84	3.25	0.81
1390	0.98	7.26	2.54	2.90	0.73	2.81	0.98	1.12	0.28	4.24	1.48	1.70	0.42	5.18	1.81	2.07	0.52	6.37	2.23	2.55	0.64	8.14	2.85	3.26	0.81
1395	0.98	7.27	2.55	2.91	0.73	2.81	0.99	1.13	0.28	4.25	1.49	1.70	0.42	5.19	1.82	2.08	0.52	6.39	2.23	2.55	0.64	8.16	2.86	3.26	0.82
1400	0.98	7.29	2.55	2.91	0.73	2.82	0.99	1.13	0.28	4.26	1.49	1.70	0.43	5.20	1.82	2.08	0.52	6.40	2.24	2.56	0.64	8.18	2.86	3.27	0.82
1405	0.99	7.30	2.56	2.92	0.73	2.83	0.99	1.13	0.28	4.26	1.49	1.71	0.43	5.21	1.82	2.09	0.52	6.41	2.24	2.56	0.64	8.19	2.87	3.28	0.82
1410	0.99	7.32	2.56	2.93	0.73	2.83	0.99	1.13	0.28	4.27	1.50	1.71	0.43	5.22	1.83	2.09	0.52	6.42	2.25	2.57	0.64	8.21	2.87	3.28	0.82
1415	0.99	7.33	2.57	2.93	0.73	2.84	0.99	1.13	0.28	4.28	1.50	1.71	0.43	5.23	1.83	2.09	0.52	6.44	2.25	2.57	0.64	8.22	2.88	3.29	0.82
1420	0.99	7.34	2.57	2.94	0.73	2.84	0.99	1.14	0.28	4.29	1.50	1.72	0.43	5.24	1.84	2.10	0.52	6.45	2.26	2.58	0.64	8.24	2.88	3.30	0.82
1425	0.99	7.36	2.58	2.94	0.74	2.85	1.00	1.14	0.28	4.30	1.50	1.72	0.43	5.25	1.84	2.10	0.53	6.46	2.26	2.58	0.65	8.26	2.89	3.30	0.83
1430	1.00	7.37	2.58	2.95	0.74	2.85	1.00	1.14	0.29	4.31	1.51	1.72	0.43	5.26	1.84	2.11	0.53	6.47	2.27	2.59	0.65	8.27	2.90	3.31	0.83
1435	1.00	7.39	2.59	2.95	0.74	2.86	1.00	1.14	0.29	4.31	1.51	1.73	0.43	5.27	1.85	2.11	0.53	6.49	2.27	2.59	0.65	8.29	2.90	3.31	0.83
1440	1.00	7.40	2.59	2.96	0.74	2.86	1.00	1.15	0.29	4.32	1.51	1.73	0.43	5.28	1.85	2.11	0.53	6.50	2.27	2.60	0.65	8.30	2.91	3.32	0.83

SUBAREA A5 HYETOPRAPHS

- Per 2006 Los Angeles County Hydrology Manual Appendix A

24 HR ISOHYETS,IN					
50 YR	2 YR	5 YR	10 YR	25 YR	100 YR
7.4	2.9	4.3	5.3	6.5	8.3



UNIT HYETOGRAPH		50 YR - 24 HR					2 YR - 24 HR					5 YR - 24 HR					10 YR - 24 HR					25 YR - 24 HR					100 YR - 24 HR				
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth						
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY						
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
30	0.01	0.08	0.03	0.03	0.01	0.03	0.01	0.01	0.00	0.05	0.02	0.02	0.00	0.06	0.02	0.02	0.01	0.07	0.03	0.03	0.01	0.09	0.03	0.04	0.01						
60	0.02	0.17	0.06	0.07	0.02	0.06	0.02	0.03	0.01	0.10	0.03	0.04	0.01	0.12	0.04	0.05	0.01	0.15	0.05	0.06	0.01	0.19	0.06	0.07	0.02						
90	0.03	0.25	0.09	0.10	0.02	0.10	0.03	0.04	0.01	0.15	0.05	0.06	0.01	0.18	0.06	0.07	0.02	0.22	0.08	0.09	0.02	0.28	0.10	0.11	0.03						
120	0.05	0.34	0.12	0.13	0.03	0.13	0.05	0.05	0.01	0.20	0.07	0.08	0.02	0.24	0.08	0.10	0.02	0.29	0.10	0.12	0.03	0.38	0.13	0.15	0.04						
150	0.06	0.42	0.15	0.17	0.04	0.16	0.06	0.07	0.02	0.25	0.09	0.10	0.02	0.30	0.11	0.12	0.03	0.37	0.13	0.15	0.04	0.47	0.17	0.19	0.05						
180	0.07	0.51	0.18	0.20	0.05	0.20	0.07	0.08	0.02	0.30	0.10	0.12	0.03	0.36	0.13	0.15	0.04	0.45	0.16	0.18	0.04	0.57	0.20	0.23	0.06						
210	0.08	0.60	0.21	0.24	0.06	0.23	0.08	0.09	0.02	0.35	0.12	0.14	0.03	0.43	0.15	0.17	0.04	0.53	0.18	0.21	0.05	0.67	0.24	0.27	0.07						
240	0.09	0.69	0.24	0.28	0.07	0.27	0.09	0.11	0.03	0.40	0.14	0.16	0.04	0.49	0.17	0.20	0.05	0.61	0.21	0.24	0.06	0.77	0.27	0.31	0.08						
270	0.11	0.78	0.27	0.31	0.08	0.30	0.11	0.12	0.03	0.46	0.16	0.18	0.05	0.56	0.20	0.22	0.06	0.69	0.24	0.27	0.07	0.88	0.31	0.35	0.09						
300	0.12	0.87	0.31	0.35	0.09	0.34	0.12	0.14	0.03	0.51	0.18	0.20	0.05	0.62	0.22	0.25	0.06	0.77	0.27	0.31	0.08	0.98	0.34	0.39	0.10						
330	0.13	0.97	0.34	0.39	0.10	0.38	0.13	0.15	0.04	0.57	0.20	0.23	0.06	0.69	0.24	0.28	0.07	0.85	0.30	0.34	0.09	1.09	0.38	0.44	0.11						
360	0.14	1.07	0.37	0.43	0.11	0.41	0.14	0.17	0.04	0.62	0.22	0.25	0.06	0.76	0.27	0.30	0.08	0.94	0.33	0.37	0.09	1.20	0.42	0.48	0.12						

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
390	0.16	1.16	0.41	0.47	0.12	0.45	0.16	0.18	0.05	0.68	0.24	0.27	0.07	0.83	0.29	0.33	0.08	1.02	0.36	0.41	0.10	1.31	0.46	0.52	0.13
420	0.17	1.26	0.44	0.51	0.13	0.49	0.17	0.20	0.05	0.74	0.26	0.30	0.07	0.90	0.32	0.36	0.09	1.11	0.39	0.44	0.11	1.42	0.50	0.57	0.14
450	0.18	1.37	0.48	0.55	0.14	0.53	0.19	0.21	0.05	0.80	0.28	0.32	0.08	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.53	0.54	0.61	0.15
480	0.20	1.47	0.51	0.59	0.15	0.57	0.20	0.23	0.06	0.86	0.30	0.34	0.09	1.05	0.37	0.42	0.11	1.29	0.45	0.52	0.13	1.65	0.58	0.66	0.17
510	0.21	1.58	0.55	0.63	0.16	0.61	0.21	0.24	0.06	0.92	0.32	0.37	0.09	1.13	0.39	0.45	0.11	1.38	0.48	0.55	0.14	1.77	0.62	0.71	0.18
540	0.23	1.69	0.59	0.67	0.17	0.65	0.23	0.26	0.07	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.48	0.52	0.59	0.15	1.89	0.66	0.76	0.19
570	0.24	1.80	0.63	0.72	0.18	0.70	0.24	0.28	0.07	1.05	0.37	0.42	0.10	1.28	0.45	0.51	0.13	1.58	0.55	0.63	0.16	2.02	0.71	0.81	0.20
600	0.26	1.91	0.67	0.76	0.19	0.74	0.26	0.30	0.07	1.12	0.39	0.45	0.11	1.36	0.48	0.55	0.14	1.68	0.59	0.67	0.17	2.14	0.75	0.86	0.21
630	0.27	2.03	0.71	0.81	0.20	0.79	0.27	0.31	0.08	1.18	0.41	0.47	0.12	1.45	0.51	0.58	0.14	1.78	0.62	0.71	0.18	2.28	0.80	0.91	0.23
660	0.29	2.15	0.75	0.86	0.21	0.83	0.29	0.33	0.08	1.25	0.44	0.50	0.13	1.53	0.54	0.61	0.15	1.89	0.66	0.75	0.19	2.41	0.84	0.96	0.24
690	0.31	2.27	0.80	0.91	0.23	0.88	0.31	0.35	0.09	1.33	0.46	0.53	0.13	1.62	0.57	0.65	0.16	2.00	0.70	0.80	0.20	2.55	0.89	1.02	0.25
720	0.32	2.40	0.84	0.96	0.24	0.93	0.33	0.37	0.09	1.40	0.49	0.56	0.14	1.71	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.69	0.94	1.08	0.27
750	0.34	2.53	0.89	1.01	0.25	0.98	0.34	0.39	0.10	1.48	0.52	0.59	0.15	1.81	0.63	0.72	0.18	2.22	0.78	0.89	0.22	2.84	0.99	1.14	0.28
780	0.36	2.67	0.93	1.07	0.27	1.03	0.36	0.41	0.10	1.56	0.55	0.62	0.16	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.99	1.05	1.20	0.30
810	0.38	2.81	0.98	1.12	0.28	1.09	0.38	0.43	0.11	1.64	0.57	0.66	0.16	2.01	0.70	0.80	0.20	2.47	0.86	0.99	0.25	3.15	1.10	1.26	0.32
840	0.40	2.96	1.04	1.18	0.30	1.14	0.40	0.46	0.11	1.73	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.60	0.91	1.04	0.26	3.32	1.16	1.33	0.33
870	0.42	3.11	1.09	1.24	0.31	1.20	0.42	0.48	0.12	1.82	0.64	0.73	0.18	2.22	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.49	1.22	1.40	0.35
900	0.44	3.27	1.15	1.31	0.33	1.27	0.44	0.51	0.13	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.88	1.01	1.15	0.29	3.67	1.29	1.47	0.37
930	0.47	3.45	1.21	1.38	0.34	1.33	0.47	0.53	0.13	2.01	0.70	0.81	0.20	2.46	0.86	0.98	0.25	3.03	1.06	1.21	0.30	3.87	1.35	1.55	0.39
960	0.49	3.63	1.27	1.45	0.36	1.40	0.49	0.56	0.14	2.12	0.74	0.85	0.21	2.59	0.91	1.04	0.26	3.19	1.12	1.27	0.32	4.07	1.43	1.63	0.41
970	0.50	3.69	1.29	1.48	0.37	1.43	0.50	0.57	0.14	2.16	0.75	0.86	0.22	2.64	0.92	1.05	0.26	3.24	1.14	1.30	0.32	4.14	1.45	1.66	0.41
980	0.51	3.76	1.32	1.50	0.38	1.45	0.51	0.58	0.15	2.20	0.77	0.88	0.22	2.68	0.94	1.07	0.27	3.30	1.16	1.32	0.33	4.22	1.48	1.69	0.42
990	0.52	3.83	1.34	1.53	0.38	1.48	0.52	0.59	0.15	2.23	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.36	1.18	1.34	0.34	4.29	1.50	1.72	0.43
1000	0.53	3.90	1.36	1.56	0.39	1.51	0.53	0.60	0.15	2.28	0.80	0.91	0.23	2.78	0.97	1.11	0.28	3.42	1.20	1.37	0.34	4.37	1.53	1.75	0.44
1010	0.54	3.97	1.39	1.59	0.40	1.54	0.54	0.61	0.15	2.32	0.81	0.93	0.23	2.83	0.99	1.13	0.28	3.48	1.22	1.39	0.35	4.45	1.56	1.78	0.45
1020	0.55	4.04	1.41	1.62	0.40	1.56	0.55	0.63	0.16	2.36	0.83	0.94	0.24	2.89	1.01	1.15	0.29	3.55	1.24	1.42	0.35	4.54	1.59	1.81	0.45
1030	0.56	4.12	1.44	1.65	0.41	1.59	0.56	0.64	0.16	2.41	0.84	0.96	0.24	2.94	1.03	1.18	0.29	3.62	1.27	1.45	0.36	4.62	1.62	1.85	0.46
1040	0.57	4.20	1.47	1.68	0.42	1.62	0.57	0.65	0.16	2.45	0.86	0.98	0.25	3.00	1.05	1.20	0.30	3.69	1.29	1.47	0.37	4.71	1.65	1.88	0.47
1050	0.58	4.28	1.50	1.71	0.43	1.66	0.58	0.66	0.17	2.50	0.88	1.00	0.25	3.06	1.07	1.22	0.31	3.76	1.32	1.50	0.38	4.80	1.68	1.92	0.48
1060	0.59	4.37	1.53	1.75	0.44	1.69	0.59	0.68	0.17	2.55	0.89	1.02	0.26	3.12	1.09	1.25	0.31	3.84	1.34	1.53	0.38	4.90	1.72	1.96	0.49
1070	0.60	4.46	1.56	1.78	0.45	1.73	0.60	0.69	0.17	2.61	0.91	1.04	0.26	3.19	1.11	1.27	0.32	3.92	1.37	1.57	0.39	5.01	1.75	2.00	0.50
1080	0.62	4.56	1.60	1.82	0.46	1.76	0.62	0.71	0.18	2.66	0.93	1.06	0.27	3.25	1.14	1.30	0.33	4.00	1.40	1.60	0.40	5.11	1.79	2.05	0.51
1090	0.63	4.66	1.63	1.86	0.47	1.80	0.63	0.72	0.18	2.72	0.95	1.09	0.27	3.33	1.17	1.33	0.33	4.09	1.43	1.64	0.41	5.23	1.83	2.09	0.52
1100	0.65	4.77	1.67	1.91	0.48	1.85	0.65	0.74	0.18	2.79	0.98	1.12	0.28	3.41	1.19	1.36	0.34	4.19	1.47	1.68	0.42	5.36	1.87	2.14	0.54
1110	0.66	4.90	1.71	1.96	0.49	1.89	0.66	0.76	0.19	2.86	1.00	1.14	0.29	3.50	1.22	1.40	0.35	4.30	1.50	1.72	0.43	5.49	1.92	2.20	0.55
1115	0.67	4.96	1.74	1.99	0.50	1.92	0.67	0.77	0.19	2.90	1.01	1.16	0.29	3.54	1.24	1.42	0.35	4.36	1.53	1.74	0.44	5.57	1.95	2.23	0.56
1120	0.68	5.03	1.76	2.01	0.50	1.95	0.68	0.78	0.19	2.94	1.03	1.18	0.29	3.59	1.26	1.44	0.36	4.42	1.55	1.77	0.44	5.65	1.98	2.26	0.56
1125	0.69	5.11	1.79	2.04	0.51	1.98	0.69	0.79	0.20	2.98	1.04	1.19	0.30	3.65	1.28	1.46	0.36	4.49	1.57	1.79	0.45	5.73	2.01	2.29	0.57
1130	0.70	5.19	1.82	2.08	0.52	2.01	0.70	0.80	0.20	3.03	1.06	1.21	0.30	3.71	1.30	1.48	0.37	4.56	1.60	1.82	0.46	5.83	2.04	2.33	0.58
1135	0.71	5.29	1.85	2.11	0.53	2.05	0.72	0.82	0.20	3.09	1.08	1.23	0.31	3.77	1.32	1.51	0.38	4.64	1.62	1.86	0.46	5.93	2.08	2.37	0.59
1136	0.72	5.31	1.86	2.12	0.53	2.05	0.72	0.82	0.21	3.10	1.08	1.24	0.31	3.79	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.95	2.08	2.38	0.60
1137	0.72	5.33	1.86	2.13	0.53	2.06	0.72	0.82	0.21	3.11	1.09	1.24	0.31	3.80	1.33	1.52	0.38	4.68	1.64	1.87	0.47	5.98	2.09	2.39	0.60
1138	0.72	5.35	1.87	2.14	0.53	2.07	0.72	0.83	0.21	3.12	1.09	1.25	0.31	3.82	1.34	1.53	0.38	4.70	1.64	1.88	0.47	6.00	2.10	2.40	0.60
1139	0.73	5.37	1.88	2.15	0.54	2.08	0.73	0.83	0.21	3.14	1.10	1.25	0.31	3.83	1.34	1.53	0.38	4.72	1.65	1.89	0.47	6.03	2.11	2.41	0.60
1140	0.73	5.39	1.89	2.16	0.54	2.09	0.73	0.83	0.21	3.15	1.10	1.26	0.31	3.85	1.35	1.54	0.39	4.74	1.66	1.89	0.47	6.05	2.12	2.42	0.61
1145	0.75	5.52	1.93	2.21	0.55	2.14	0.75	0.86	0.21	3.23	1.13	1.29	0.32	3.94	1.38	1.58	0.39	4.85	1.70	1.94	0.49	6.20	2.17	2.48	0.62
1150	0.77	5.72	2.00	2.29	0.57	2.21	0.77	0.88	0.22	3.34	1.17	1.34	0.33	4.08	1.43	1.63	0.41	5.02	1.76	2.01	0.50	6.41	2.24	2.57	0.64
1151	0.78	5.78	2.02	2.31	0.58	2.24	0.78	0.89	0.22	3.37	1.18	1.35	0.34	4.13	1.44	1.65	0.41	5.07	1.78	2.03	0.51	6.48	2.27	2.59	0.65
1152	0.80	5.92	2.07	2.37	0.59	2.29	0.80	0.92	0.23	3.46	1.21	1.38	0.35	4.23	1.48	1.69	0.42	5.20	1.82	2.08	0.52	6.64	2.32	2.66	0.66
1153	0.81	5.99	2.																						

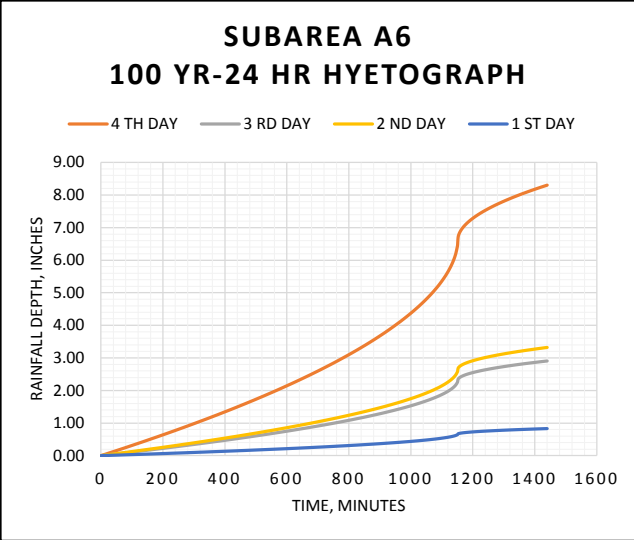
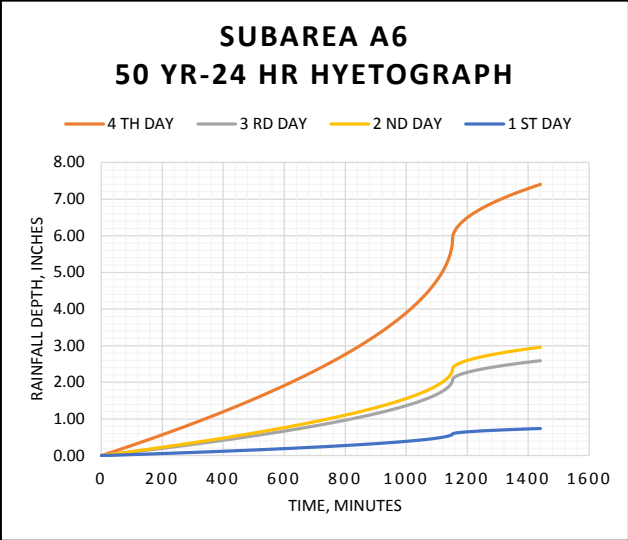
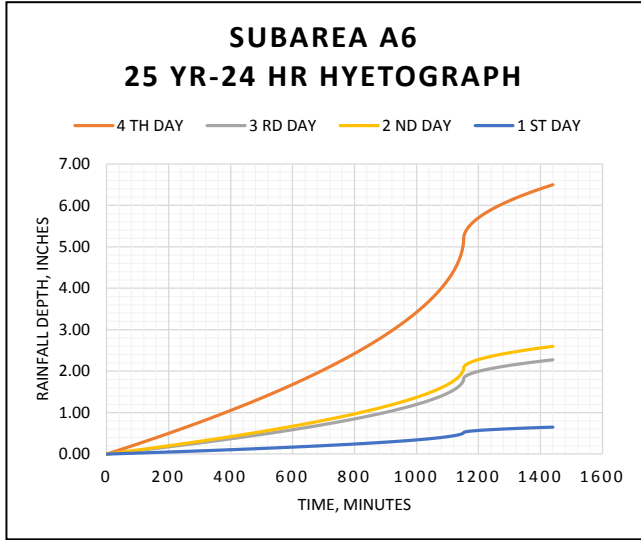
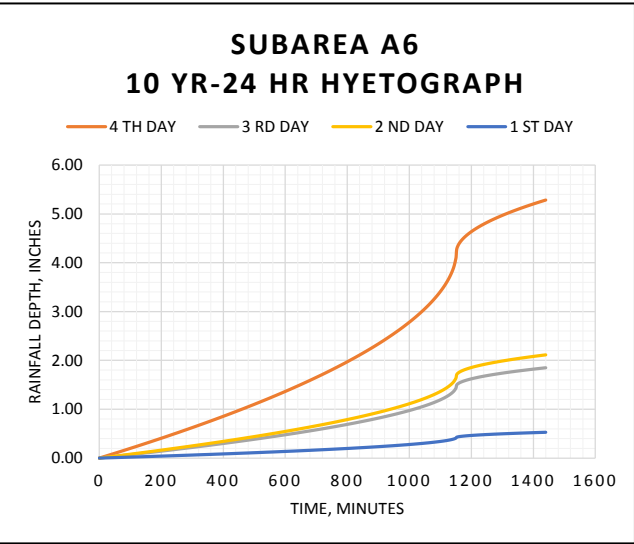
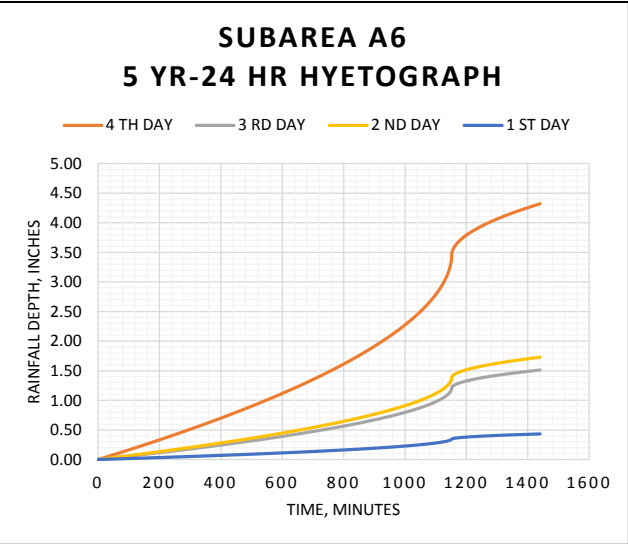
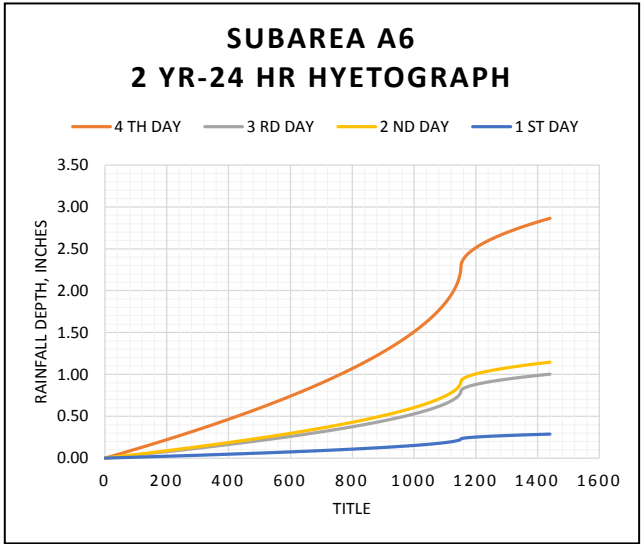
UNIT HYTOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1164	0.84	6.19	2.17	2.48	0.62	2.40	0.84	0.96	0.24	3.62	1.27	1.45	0.36	4.42	1.55	1.77	0.44	5.44	1.90	2.18	0.54	6.95	2.43	2.78	0.70
1165	0.84	6.21	2.17	2.48	0.62	2.40	0.84	0.96	0.24	3.62	1.27	1.45	0.36	4.43	1.55	1.77	0.44	5.45	1.91	2.18	0.54	6.96	2.44	2.79	0.70
1166	0.84	6.22	2.18	2.49	0.62	2.41	0.84	0.96	0.24	3.63	1.27	1.45	0.36	4.44	1.55	1.78	0.44	5.46	1.91	2.18	0.55	6.98	2.44	2.79	0.70
1167	0.84	6.23	2.18	2.49	0.62	2.41	0.84	0.96	0.24	3.64	1.27	1.46	0.36	4.45	1.56	1.78	0.44	5.47	1.91	2.19	0.55	6.99	2.45	2.80	0.70
1168	0.84	6.24	2.18	2.50	0.62	2.41	0.85	0.97	0.24	3.64	1.28	1.46	0.36	4.46	1.56	1.78	0.45	5.48	1.92	2.19	0.55	7.00	2.45	2.80	0.70
1169	0.84	6.25	2.19	2.50	0.63	2.42	0.85	0.97	0.24	3.65	1.28	1.46	0.37	4.46	1.56	1.79	0.45	5.49	1.92	2.20	0.55	7.01	2.45	2.81	0.70
1170	0.85	6.26	2.19	2.50	0.63	2.42	0.85	0.97	0.24	3.66	1.28	1.46	0.37	4.47	1.56	1.79	0.45	5.50	1.92	2.20	0.55	7.02	2.46	2.81	0.70
1171	0.85	6.27	2.19	2.51	0.63	2.43	0.85	0.97	0.24	3.66	1.28	1.46	0.37	4.48	1.57	1.79	0.45	5.51	1.93	2.20	0.55	7.04	2.46	2.81	0.70
1172	0.85	6.28	2.20	2.51	0.63	2.43	0.85	0.97	0.24	3.67	1.28	1.47	0.37	4.48	1.57	1.79	0.45	5.51	1.93	2.21	0.55	7.05	2.47	2.82	0.70
1173	0.85	6.29	2.20	2.52	0.63	2.43	0.85	0.97	0.24	3.67	1.29	1.47	0.37	4.49	1.57	1.80	0.45	5.52	1.93	2.21	0.55	7.06	2.47	2.82	0.71
1174	0.85	6.30	2.20	2.52	0.63	2.44	0.85	0.98	0.24	3.68	1.29	1.47	0.37	4.50	1.57	1.80	0.45	5.53	1.94	2.21	0.55	7.07	2.47	2.83	0.71
1175	0.85	6.31	2.21	2.52	0.63	2.44	0.85	0.98	0.24	3.68	1.29	1.47	0.37	4.50	1.58	1.80	0.45	5.54	1.94	2.22	0.55	7.08	2.48	2.83	0.71
1176	0.85	6.32	2.21	2.53	0.63	2.44	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.51	1.58	1.80	0.45	5.55	1.94	2.22	0.55	7.09	2.48	2.83	0.71
1177	0.85	6.33	2.21	2.53	0.63	2.45	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.55	1.94	2.22	0.56	7.10	2.48	2.84	0.71
1178	0.86	6.33	2.22	2.53	0.63	2.45	0.86	0.98	0.25	3.70	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.56	1.95	2.22	0.56	7.11	2.49	2.84	0.71
1179	0.86	6.34	2.22	2.54	0.63	2.45	0.86	0.98	0.25	3.70	1.30	1.48	0.37	4.53	1.58	1.81	0.45	5.57	1.95	2.23	0.56	7.12	2.49	2.85	0.71
1180	0.86	6.35	2.22	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.53	1.59	1.81	0.45	5.58	1.95	2.23	0.56	7.13	2.49	2.85	0.71
1181	0.86	6.36	2.23	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.49	0.37	4.54	1.59	1.82	0.45	5.58	1.95	2.23	0.56	7.13	2.50	2.85	0.71
1182	0.86	6.37	2.23	2.55	0.64	2.46	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.45	5.59	1.96	2.24	0.56	7.14	2.50	2.86	0.71
1183	0.86	6.37	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.15	2.50	2.86	0.72
1184	0.86	6.38	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.73	1.30	1.49	0.37	4.56	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.16	2.51	2.86	0.72
1185	0.86	6.39	2.24	2.56	0.64	2.47	0.87	0.99	0.25	3.73	1.31	1.49	0.37	4.56	1.60	1.82	0.46	5.61	1.96	2.24	0.56	7.17	2.51	2.87	0.72
1186	0.86	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.49	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.18	2.51	2.87	0.72
1187	0.87	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.19	2.51	2.87	0.72
1188	0.87	6.41	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.63	1.97	2.25	0.56	7.19	2.52	2.88	0.72
1189	0.87	6.42	2.25	2.57	0.64	2.48	0.87	0.99	0.25	3.75	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.64	1.97	2.25	0.56	7.20	2.52	2.88	0.72
1190	0.87	6.43	2.25	2.57	0.64	2.49	0.87	0.99	0.25	3.75	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.64	1.97	2.26	0.56	7.21	2.52	2.88	0.72
1191	0.87	6.43	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.76	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.65	1.98	2.26	0.56	7.22	2.53	2.89	0.72
1192	0.87	6.44	2.25	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.50	0.38	4.60	1.61	1.84	0.46	5.65	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1193	0.87	6.45	2.26	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.51	0.38	4.60	1.61	1.84	0.46	5.66	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1194	0.87	6.45	2.26	2.58	0.65	2.50	0.87	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.84	0.46	5.67	1.98	2.27	0.57	7.24	2.53	2.90	0.72
1195	0.87	6.46	2.26	2.58	0.65	2.50	0.88	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.85	0.46	5.67	1.99	2.27	0.57	7.25	2.54	2.90	0.72
1196	0.87	6.47	2.26	2.59	0.65	2.50	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.90	0.73
1197	0.87	6.47	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.91	0.73
1198	0.88	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.27	2.54	2.91	0.73
1199	0.88	6.49	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.52	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.28	2.55	2.91	0.73
1200	0.88	6.49	2.27	2.60	0.65	2.51	0.88	1.01	0.25	3.79	1.33	1.52	0.38	4.64	1.62	1.85	0.46	5.70	2.00	2.28	0.57	7.28	2.55	2.91	0.73
1201	0.88	6.50	2.27	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.62	1.86	0.46	5.71	2.00	2.28	0.57	7.29	2.55	2.92	0.73
1202	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.63	1.86	0.46	5.71	2.00	2.28	0.57	7.30	2.55	2.92	0.73
1203	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.65	1.63	1.86	0.46	5.72	2.00	2.29	0.57	7.31	2.56	2.92	0.73
1204	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.65	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.31	2.56	2.93	0.73
1205	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.73	2.00	2.29	0.57	7.32	2.56	2.93	0.73
1206	0.88	6.53	2.29	2.61	0.65	2.53	0.88	1.01	0.25	3.81	1.33	1.53	0.38	4.66	1.63	1.86	0.47	5.73	2.01	2.29	0.57	7.33	2.56	2.93	0.73
1207	0.88	6.54	2.29	2.61	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.33	2.57	2.93	0.73
1208	0.88	6.54	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.34	2.57	2.94	0.73
1209	0.88	6.55	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.64	1.87	0.47	5.75	2.01	2.30	0.57	7.35	2.57	2.94	0.73
1210	0.89	6.55	2.29	2.62	0.66	2.54	0.89	1.01	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.75	2.01	2.30	0.58	7.35	2.57	2.94	0.74
1211	0.89	6.56	2.30	2.62	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.76	2.02	2.30	0.58	7.36	2.58	2.94	0.74
1212	0.89	6.56	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.69	1.64	1.87	0.47	5.76	2.02	2.31	0.58	7.37	2.58	2.95	0.74
1213	0.89	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.53	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.37	2.58	2.95	0.74

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1224	0.90	6.63	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.44	2.60	2.98	0.74
1225	0.90	6.64	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.74	1.66	1.89	0.47	5.83	2.04	2.33	0.58	7.44	2.61	2.98	0.74
1226	0.90	6.64	2.32	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.75
1227	0.90	6.65	2.33	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.46	2.61	2.98	0.75
1228	0.90	6.65	2.33	2.66	0.67	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.75	1.66	1.90	0.47	5.84	2.04	2.34	0.58	7.46	2.61	2.98	0.75
1229	0.90	6.66	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.55	0.39	4.75	1.66	1.90	0.48	5.84	2.05	2.34	0.58	7.47	2.61	2.99	0.75
1230	0.90	6.66	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.76	1.66	1.90	0.48	5.85	2.05	2.34	0.58	7.47	2.62	2.99	0.75
1231	0.90	6.67	2.33	2.67	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.76	1.67	1.90	0.48	5.85	2.05	2.34	0.59	7.48	2.62	2.99	0.75
1232	0.90	6.67	2.33	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.76	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.48	2.62	2.99	0.75
1233	0.90	6.68	2.34	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.77	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.49	2.62	3.00	0.75
1234	0.90	6.68	2.34	2.67	0.67	2.59	0.90	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.62	3.00	0.75
1235	0.90	6.69	2.34	2.67	0.67	2.59	0.91	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.63	3.00	0.75
1240	0.91	6.71	2.35	2.68	0.67	2.60	0.91	1.04	0.26	3.92	1.37	1.57	0.39	4.79	1.68	1.92	0.48	5.89	2.06	2.36	0.59	7.53	2.63	3.01	0.75
1245	0.91	6.73	2.36	2.69	0.67	2.61	0.91	1.04	0.26	3.93	1.38	1.57	0.39	4.81	1.68	1.92	0.48	5.91	2.07	2.36	0.59	7.55	2.64	3.02	0.76
1250	0.91	6.76	2.36	2.70	0.68	2.61	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.08	2.37	0.59	7.58	2.65	3.03	0.76
1255	0.92	6.78	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.96	1.39	1.58	0.40	4.84	1.69	1.94	0.48	5.95	2.08	2.38	0.60	7.61	2.66	3.04	0.76
1260	0.92	6.80	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.86	1.70	1.94	0.49	5.97	2.09	2.39	0.60	7.63	2.67	3.05	0.76
1265	0.92	6.82	2.39	2.73	0.68	2.64	0.92	1.06	0.26	3.98	1.39	1.59	0.40	4.87	1.70	1.95	0.49	5.99	2.10	2.40	0.60	7.65	2.68	3.06	0.77
1270	0.92	6.84	2.39	2.74	0.68	2.65	0.93	1.06	0.26	4.00	1.40	1.60	0.40	4.89	1.71	1.95	0.49	6.01	2.10	2.40	0.60	7.68	2.69	3.07	0.77
1275	0.93	6.86	2.40	2.75	0.69	2.66	0.93	1.06	0.27	4.01	1.40	1.60	0.40	4.90	1.72	1.96	0.49	6.03	2.11	2.41	0.60	7.70	2.70	3.08	0.77
1280	0.93	6.88	2.41	2.75	0.69	2.66	0.93	1.07	0.27	4.02	1.41	1.61	0.40	4.91	1.72	1.97	0.49	6.04	2.12	2.42	0.60	7.72	2.70	3.09	0.77
1285	0.93	6.90	2.42	2.76	0.69	2.67	0.93	1.07	0.27	4.03	1.41	1.61	0.40	4.93	1.72	1.97	0.49	6.06	2.12	2.42	0.61	7.74	2.71	3.10	0.77
1290	0.94	6.92	2.42	2.77	0.69	2.68	0.94	1.07	0.27	4.04	1.41	1.62	0.40	4.94	1.73	1.98	0.49	6.08	2.13	2.43	0.61	7.77	2.72	3.11	0.78
1295	0.94	6.94	2.43	2.78	0.69	2.69	0.94	1.07	0.27	4.05	1.42	1.62	0.41	4.96	1.73	1.98	0.50	6.09	2.13	2.44	0.61	7.79	2.73	3.12	0.78
1300	0.94	6.96	2.44	2.78	0.70	2.69	0.94	1.08	0.27	4.06	1.42	1.63	0.41	4.97	1.74	1.99	0.50	6.11	2.14	2.44	0.61	7.81	2.73	3.12	0.78
1305	0.94	6.98	2.44	2.79	0.70	2.70	0.95	1.08	0.27	4.08	1.43	1.63	0.41	4.98	1.74	1.99	0.50	6.13	2.14	2.45	0.61	7.83	2.74	3.13	0.78
1310	0.95	7.00	2.45	2.80	0.70	2.71	0.95	1.08	0.27	4.09	1.43	1.63	0.41	5.00	1.75	2.00	0.50	6.14	2.15	2.46	0.61	7.85	2.75	3.14	0.79
1315	0.95	7.01	2.46	2.81	0.70	2.71	0.95	1.09	0.27	4.10	1.43	1.64	0.41	5.01	1.75	2.00	0.50	6.16	2.16	2.46	0.62	7.87	2.75	3.15	0.79
1320	0.95	7.03	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.11	1.44	1.64	0.41	5.02	1.76	2.01	0.50	6.17	2.16	2.47	0.62	7.89	2.76	3.16	0.79
1325	0.95	7.05	2.47	2.82	0.70	2.73	0.95	1.09	0.27	4.12	1.44	1.65	0.41	5.03	1.76	2.01	0.50	6.19	2.17	2.48	0.62	7.91	2.77	3.16	0.79
1330	0.95	7.07	2.47	2.83	0.71	2.73	0.96	1.09	0.27	4.13	1.44	1.65	0.41	5.05	1.77	2.02	0.50	6.20	2.17	2.48	0.62	7.93	2.78	3.17	0.79
1335	0.96	7.08	2.48	2.83	0.71	2.74	0.96	1.10	0.27	4.14	1.45	1.65	0.41	5.06	1.77	2.02	0.51	6.22	2.18	2.49	0.62	7.95	2.78	3.18	0.79
1340	0.96	7.10	2.49	2.84	0.71	2.75	0.96	1.10	0.27	4.15	1.45	1.66	0.41	5.07	1.77	2.03	0.51	6.23	2.18	2.49	0.62	7.97	2.79	3.19	0.80
1345	0.96	7.12	2.49	2.85	0.71	2.75	0.96	1.10	0.28	4.16	1.45	1.66	0.42	5.08	1.78	2.03	0.51	6.25	2.19	2.50	0.62	7.99	2.79	3.19	0.80
1350	0.96	7.13	2.50	2.85	0.71	2.76	0.97	1.10	0.28	4.17	1.46	1.67	0.42	5.09	1.78	2.04	0.51	6.26	2.19	2.51	0.63	8.00	2.80	3.20	0.80
1355	0.97	7.15	2.50	2.86	0.71	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.10	1.79	2.04	0.51	6.28	2.20	2.51	0.63	8.02	2.81	3.21	0.80
1360	0.97	7.17	2.51	2.87	0.72	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.12	1.79	2.05	0.51	6.29	2.20	2.52	0.63	8.04	2.81	3.22	0.80
1365	0.97	7.18	2.51	2.87	0.72	2.78	0.97	1.11	0.28	4.19	1.47	1.68	0.42	5.13	1.79	2.05	0.51	6.31	2.21	2.52	0.63	8.06	2.82	3.22	0.81
1370	0.97	7.20	2.52	2.88	0.72	2.79	0.97	1.11	0.28	4.20	1.47	1.68	0.42	5.14	1.80	2.06	0.51	6.32	2.21	2.53	0.63	8.07	2.83	3.23	0.81
1375	0.97	7.21	2.52	2.88	0.72	2.79	0.98	1.12	0.28	4.21	1.47	1.68	0.42	5.15	1.80	2.06	0.51	6.33	2.22	2.53	0.63	8.09	2.83	3.24	0.81
1380	0.98	7.23	2.53	2.89	0.72	2.80	0.98	1.12	0.28	4.22	1.48	1.69	0.42	5.16	1.81	2.06	0.52	6.35	2.22	2.54	0.63	8.11	2.84	3.24	0.81
1385	0.98	7.24	2.53	2.90	0.72	2.80	0.98	1.12	0.28	4.23	1.48	1.69	0.42	5.17	1.81	2.07	0.52	6.36	2.23	2.54	0.64	8.13	2.84	3.25	0.81
1390	0.98	7.26	2.54	2.90	0.73	2.81	0.98	1.12	0.28	4.24	1.48	1.70	0.42	5.18	1.81	2.07	0.52	6.37	2.23	2.55	0.64	8.14	2.85	3.26	0.81
1395	0.98	7.27	2.55	2.91	0.73	2.81	0.99	1.13	0.28	4.25	1.49	1.70	0.42	5.19	1.82	2.08	0.52	6.39	2.23	2.55	0.64	8.16	2.86	3.26	0.82
1400	0.98	7.29	2.55	2.91	0.73	2.82	0.99	1.13	0.28	4.26	1.49	1.70	0.43	5.20	1.82	2.08	0.52	6.40	2.24	2.56	0.64	8.18	2.86	3.27	0.82
1405	0.99	7.30	2.56	2.92	0.73	2.83	0.99	1.13	0.28	4.26	1.49	1.71	0.43	5.21	1.82	2.09	0.52	6.41	2.24	2.56	0.64	8.19	2.87	3.28	0.82
1410	0.99	7.32	2.56	2.93	0.73	2.83	0.99	1.13	0.28	4.27	1.50	1.71	0.43	5.22	1.83	2.09	0.52	6.42	2.25	2.57	0.64	8.21	2.87	3.28	0.82
1415	0.99	7.33	2.57	2.93	0.73	2.84	0.99	1.13	0.28	4.28	1.50	1.71	0.43	5.23	1.83	2.09	0.52	6.44	2.25	2.57	0.64	8.22	2.88	3.29	0.82
1420	0.99	7.34	2.57	2.94	0.73	2.84	0.99	1.14	0.28	4.29	1.50	1.72	0.43	5.24	1.84	2.10	0.52	6.45	2.26	2.58	0.64	8.24	2.88	3.30	0.82
1425																									

SUBAREA A6 HYETOPGRAPHS

- Per 2006 Los Angeles County Hydrology Manual Appendix A

24 HR ISOHYETS,IN					
50 YR	2 YR	5 YR	10 YR	25 YR	100 YR
7.4	2.9	4.3	5.3	6.5	8.3



UNIT HYETOGRAPH		50 YR - 24 HR					2 YR - 24 HR					5 YR - 24 HR					10 YR - 24 HR					25 YR - 24 HR					100 YR - 24 HR				
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth					
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY						
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
30	0.01	0.08	0.03	0.03	0.01	0.03	0.01	0.01	0.00	0.05	0.02	0.02	0.00	0.06	0.02	0.02	0.01	0.07	0.03	0.03	0.01	0.09	0.03	0.04	0.01						
60	0.02	0.17	0.06	0.07	0.02	0.06	0.02	0.03	0.01	0.10	0.03	0.04	0.01	0.12	0.04	0.05	0.01	0.15	0.05	0.06	0.01	0.19	0.06	0.07	0.02						
90	0.03	0.25	0.09	0.10	0.02	0.10	0.03	0.04	0.01	0.15	0.05	0.06	0.01	0.18	0.06	0.07	0.02	0.22	0.08	0.09	0.02	0.28	0.10	0.11	0.03						
120	0.05	0.34	0.12	0.13	0.03	0.13	0.05	0.05	0.01	0.20	0.07	0.08	0.02	0.24	0.08	0.10	0.02	0.29	0.10	0.12	0.03	0.38	0.13	0.15	0.04						
150	0.06	0.42	0.15	0.17	0.04	0.16	0.06	0.07	0.02	0.25	0.09	0.10	0.02	0.30	0.11	0.12	0.03	0.37	0.13	0.15	0.04	0.47	0.17	0.19	0.05						
180	0.07	0.51	0.18	0.20	0.05	0.20	0.07	0.08	0.02	0.30	0.10	0.12	0.03	0.36	0.13	0.15	0.04	0.45	0.16	0.18	0.04	0.57	0.20	0.23	0.06						
210	0.08	0.60	0.21	0.24	0.06	0.23	0.08	0.09	0.02	0.35	0.12	0.14	0.03	0.43	0.15	0.17	0.04	0.53	0.18	0.21	0.05	0.67	0.24	0.27	0.07						
240	0.09	0.69	0.24	0.28	0.07	0.27	0.09	0.11	0.03	0.40	0.14	0.16	0.04	0.49	0.17	0.20	0.05	0.61	0.21	0.24	0.06	0.77	0.27	0.31	0.08						
270	0.11	0.78	0.27	0.31	0.08	0.30	0.11	0.12	0.03	0.46	0.16	0.18	0.05	0.56	0.20	0.22	0.06	0.69	0.24	0.27	0.07	0.88	0.31	0.35	0.09						
300	0.12	0.87	0.31	0.35	0.09	0.34	0.12	0.14	0.03	0.51	0.18	0.20	0.05	0.62	0.22	0.25	0.06	0.77	0.27	0.31	0.08	0.98	0.34	0.39	0.10						
330	0.13	0.97	0.34	0.39	0.10	0.38	0.13	0.15	0.04	0.57	0.20	0.23	0.06	0.69	0.24	0.28	0.07	0.85	0.30	0.34	0.09	1.09	0.38	0.44	0.11						
360	0.14	1.07	0.37	0.43	0.11	0.41	0.14	0.17	0.04	0.62	0.22	0.25	0.06	0.76	0.27	0.30	0.08	0.94	0.33	0.37	0.09	1.20	0.42	0.48	0.12						

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
390	0.16	1.16	0.41	0.47	0.12	0.45	0.16	0.18	0.05	0.68	0.24	0.27	0.07	0.83	0.29	0.33	0.08	1.02	0.36	0.41	0.10	1.31	0.46	0.52	0.13
420	0.17	1.26	0.44	0.51	0.13	0.49	0.17	0.20	0.05	0.74	0.26	0.30	0.07	0.90	0.32	0.36	0.09	1.11	0.39	0.44	0.11	1.42	0.50	0.57	0.14
450	0.18	1.37	0.48	0.55	0.14	0.53	0.19	0.21	0.05	0.80	0.28	0.32	0.08	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.53	0.54	0.61	0.15
480	0.20	1.47	0.51	0.59	0.15	0.57	0.20	0.23	0.06	0.86	0.30	0.34	0.09	1.05	0.37	0.42	0.11	1.29	0.45	0.52	0.13	1.65	0.58	0.66	0.17
510	0.21	1.58	0.55	0.63	0.16	0.61	0.21	0.24	0.06	0.92	0.32	0.37	0.09	1.13	0.39	0.45	0.11	1.38	0.48	0.55	0.14	1.77	0.62	0.71	0.18
540	0.23	1.69	0.59	0.67	0.17	0.65	0.23	0.26	0.07	0.98	0.34	0.39	0.10	1.20	0.42	0.48	0.12	1.48	0.52	0.59	0.15	1.89	0.66	0.76	0.19
570	0.24	1.80	0.63	0.72	0.18	0.70	0.24	0.28	0.07	1.05	0.37	0.42	0.10	1.28	0.45	0.51	0.13	1.58	0.55	0.63	0.16	2.02	0.71	0.81	0.20
600	0.26	1.91	0.67	0.76	0.19	0.74	0.26	0.30	0.07	1.12	0.39	0.45	0.11	1.36	0.48	0.55	0.14	1.68	0.59	0.67	0.17	2.14	0.75	0.86	0.21
630	0.27	2.03	0.71	0.81	0.20	0.79	0.27	0.31	0.08	1.18	0.41	0.47	0.12	1.45	0.51	0.58	0.14	1.78	0.62	0.71	0.18	2.28	0.80	0.91	0.23
660	0.29	2.15	0.75	0.86	0.21	0.83	0.29	0.33	0.08	1.25	0.44	0.50	0.13	1.53	0.54	0.61	0.15	1.89	0.66	0.75	0.19	2.41	0.84	0.96	0.24
690	0.31	2.27	0.80	0.91	0.23	0.88	0.31	0.35	0.09	1.33	0.46	0.53	0.13	1.62	0.57	0.65	0.16	2.00	0.70	0.80	0.20	2.55	0.89	1.02	0.25
720	0.32	2.40	0.84	0.96	0.24	0.93	0.33	0.37	0.09	1.40	0.49	0.56	0.14	1.71	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.69	0.94	1.08	0.27
750	0.34	2.53	0.89	1.01	0.25	0.98	0.34	0.39	0.10	1.48	0.52	0.59	0.15	1.81	0.63	0.72	0.18	2.22	0.78	0.89	0.22	2.84	0.99	1.14	0.28
780	0.36	2.67	0.93	1.07	0.27	1.03	0.36	0.41	0.10	1.56	0.55	0.62	0.16	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.99	1.05	1.20	0.30
810	0.38	2.81	0.98	1.12	0.28	1.09	0.38	0.43	0.11	1.64	0.57	0.66	0.16	2.01	0.70	0.80	0.20	2.47	0.86	0.99	0.25	3.15	1.10	1.26	0.32
840	0.40	2.96	1.04	1.18	0.30	1.14	0.40	0.46	0.11	1.73	0.60	0.69	0.17	2.11	0.74	0.84	0.21	2.60	0.91	1.04	0.26	3.32	1.16	1.33	0.33
870	0.42	3.11	1.09	1.24	0.31	1.20	0.42	0.48	0.12	1.82	0.64	0.73	0.18	2.22	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.49	1.22	1.40	0.35
900	0.44	3.27	1.15	1.31	0.33	1.27	0.44	0.51	0.13	1.91	0.67	0.76	0.19	2.34	0.82	0.94	0.23	2.88	1.01	1.15	0.29	3.67	1.29	1.47	0.37
930	0.47	3.45	1.21	1.38	0.34	1.33	0.47	0.53	0.13	2.01	0.70	0.81	0.20	2.46	0.86	0.98	0.25	3.03	1.06	1.21	0.30	3.87	1.35	1.55	0.39
960	0.49	3.63	1.27	1.45	0.36	1.40	0.49	0.56	0.14	2.12	0.74	0.85	0.21	2.59	0.91	1.04	0.26	3.19	1.12	1.27	0.32	4.07	1.43	1.63	0.41
970	0.50	3.69	1.29	1.48	0.37	1.43	0.50	0.57	0.14	2.16	0.75	0.86	0.22	2.64	0.92	1.05	0.26	3.24	1.14	1.30	0.32	4.14	1.45	1.66	0.41
980	0.51	3.76	1.32	1.50	0.38	1.45	0.51	0.58	0.15	2.20	0.77	0.88	0.22	2.68	0.94	1.07	0.27	3.30	1.16	1.32	0.33	4.22	1.48	1.69	0.42
990	0.52	3.83	1.34	1.53	0.38	1.48	0.52	0.59	0.15	2.23	0.78	0.89	0.22	2.73	0.96	1.09	0.27	3.36	1.18	1.34	0.34	4.29	1.50	1.72	0.43
1000	0.53	3.90	1.36	1.56	0.39	1.51	0.53	0.60	0.15	2.28	0.80	0.91	0.23	2.78	0.97	1.11	0.28	3.42	1.20	1.37	0.34	4.37	1.53	1.75	0.44
1010	0.54	3.97	1.39	1.59	0.40	1.54	0.54	0.61	0.15	2.32	0.81	0.93	0.23	2.83	0.99	1.13	0.28	3.48	1.22	1.39	0.35	4.45	1.56	1.78	0.45
1020	0.55	4.04	1.41	1.62	0.40	1.56	0.55	0.63	0.16	2.36	0.83	0.94	0.24	2.89	1.01	1.15	0.29	3.55	1.24	1.42	0.35	4.54	1.59	1.81	0.45
1030	0.56	4.12	1.44	1.65	0.41	1.59	0.56	0.64	0.16	2.41	0.84	0.96	0.24	2.94	1.03	1.18	0.29	3.62	1.27	1.45	0.36	4.62	1.62	1.85	0.46
1040	0.57	4.20	1.47	1.68	0.42	1.62	0.57	0.65	0.16	2.45	0.86	0.98	0.25	3.00	1.05	1.20	0.30	3.69	1.29	1.47	0.37	4.71	1.65	1.88	0.47
1050	0.58	4.28	1.50	1.71	0.43	1.66	0.58	0.66	0.17	2.50	0.88	1.00	0.25	3.06	1.07	1.22	0.31	3.76	1.32	1.50	0.38	4.80	1.68	1.92	0.48
1060	0.59	4.37	1.53	1.75	0.44	1.69	0.59	0.68	0.17	2.55	0.89	1.02	0.26	3.12	1.09	1.25	0.31	3.84	1.34	1.53	0.38	4.90	1.72	1.96	0.49
1070	0.60	4.46	1.56	1.78	0.45	1.73	0.60	0.69	0.17	2.61	0.91	1.04	0.26	3.19	1.11	1.27	0.32	3.92	1.37	1.57	0.39	5.01	1.75	2.00	0.50
1080	0.62	4.56	1.60	1.82	0.46	1.76	0.62	0.71	0.18	2.66	0.93	1.06	0.27	3.25	1.14	1.30	0.33	4.00	1.40	1.60	0.40	5.11	1.79	2.05	0.51
1090	0.63	4.66	1.63	1.86	0.47	1.80	0.63	0.72	0.18	2.72	0.95	1.09	0.27	3.33	1.17	1.33	0.33	4.09	1.43	1.64	0.41	5.23	1.83	2.09	0.52
1100	0.65	4.77	1.67	1.91	0.48	1.85	0.65	0.74	0.18	2.79	0.98	1.12	0.28	3.41	1.19	1.36	0.34	4.19	1.47	1.68	0.42	5.36	1.87	2.14	0.54
1110	0.66	4.90	1.71	1.96	0.49	1.89	0.66	0.76	0.19	2.86	1.00	1.14	0.29	3.50	1.22	1.40	0.35	4.30	1.50	1.72	0.43	5.49	1.92	2.20	0.55
1115	0.67	4.96	1.74	1.99	0.50	1.92	0.67	0.77	0.19	2.90	1.01	1.16	0.29	3.54	1.24	1.42	0.35	4.36	1.53	1.74	0.44	5.57	1.95	2.23	0.56
1120	0.68	5.03	1.76	2.01	0.50	1.95	0.68	0.78	0.19	2.94	1.03	1.18	0.29	3.59	1.26	1.44	0.36	4.42	1.55	1.77	0.44	5.65	1.98	2.26	0.56
1125	0.69	5.11	1.79	2.04	0.51	1.98	0.69	0.79	0.20	2.98	1.04	1.19	0.30	3.65	1.28	1.46	0.36	4.49	1.57	1.79	0.45	5.73	2.01	2.29	0.57
1130	0.70	5.19	1.82	2.08	0.52	2.01	0.70	0.80	0.20	3.03	1.06	1.21	0.30	3.71	1.30	1.48	0.37	4.56	1.60	1.82	0.46	5.83	2.04	2.33	0.58
1135	0.71	5.29	1.85	2.11	0.53	2.05	0.72	0.82	0.20	3.09	1.08	1.23	0.31	3.77	1.32	1.51	0.38	4.64	1.62	1.86	0.46	5.93	2.08	2.37	0.59
1136	0.72	5.31	1.86	2.12	0.53	2.05	0.72	0.82	0.21	3.10	1.08	1.24	0.31	3.79	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.95	2.08	2.38	0.60
1137	0.72	5.33	1.86	2.13	0.53	2.06	0.72	0.82	0.21	3.11	1.09	1.24	0.31	3.80	1.33	1.52	0.38	4.68	1.64	1.87	0.47	5.98	2.09	2.39	0.60
1138	0.72	5.35	1.87	2.14	0.53	2.07	0.72	0.83	0.21	3.12	1.09	1.25	0.31	3.82	1.34	1.53	0.38	4.70	1.64	1.88	0.47	6.00	2.10	2.40	0.60
1139	0.73	5.37	1.88	2.15	0.54	2.08	0.73	0.83	0.21	3.14	1.10	1.25	0.31	3.83	1.34	1.53	0.38	4.72	1.65	1.89	0.47	6.03	2.11	2.41	0.60
1140	0.73	5.39	1.89	2.16	0.54	2.09	0.73	0.83	0.21	3.15	1.10	1.26	0.31	3.85	1.35	1.54	0.39	4.74	1.66	1.89	0.47	6.05	2.12	2.42	0.61
1145	0.75	5.52	1.93	2.21	0.55	2.14	0.75	0.86	0.21	3.23	1.13	1.29	0.32	3.94	1.38	1.58	0.39	4.85	1.70	1.94	0.49	6.20	2.17	2.48	0.62
1150	0.77	5.72	2.00	2.29	0.57	2.21	0.77	0.88	0.22	3.34	1.17	1.34	0.33	4.08	1.43	1.63	0.41	5.02	1.76	2.01	0.50	6.41	2.24	2.57	0.64
1151	0.78	5.78	2.02	2.31	0.58	2.24	0.78	0.89	0.22	3.37	1.18	1.35	0.34	4.13	1.44	1.65	0.41	5.07	1.78	2.03	0.51	6.48	2.27	2.59	0.65
1152	0.80	5.92	2.07	2.37	0.59	2.29	0.80	0.92	0.23	3.46	1.21	1.38	0.35	4.23	1.48	1.69	0.42	5.20	1.82	2.08	0.52	6.64	2.32	2.66	0.66
1153	0.81	5.99	2.																						

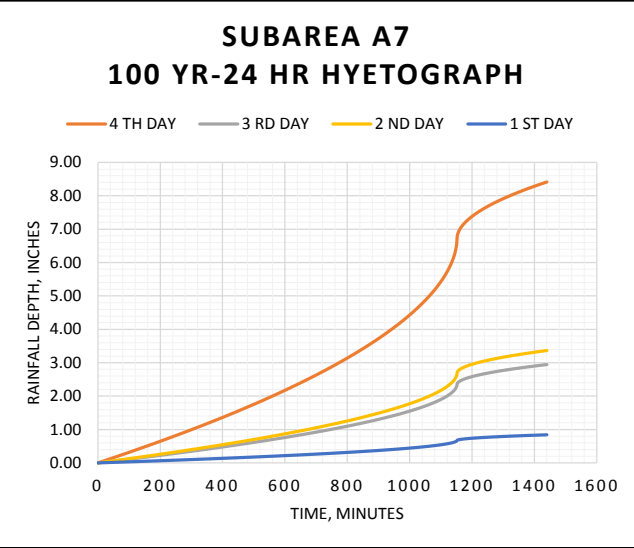
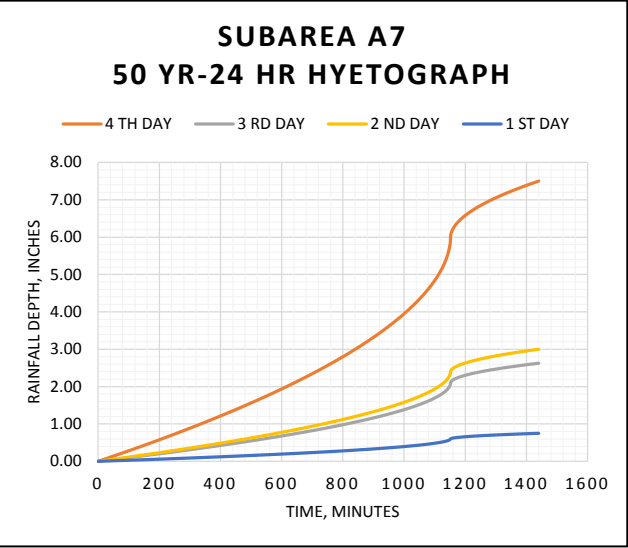
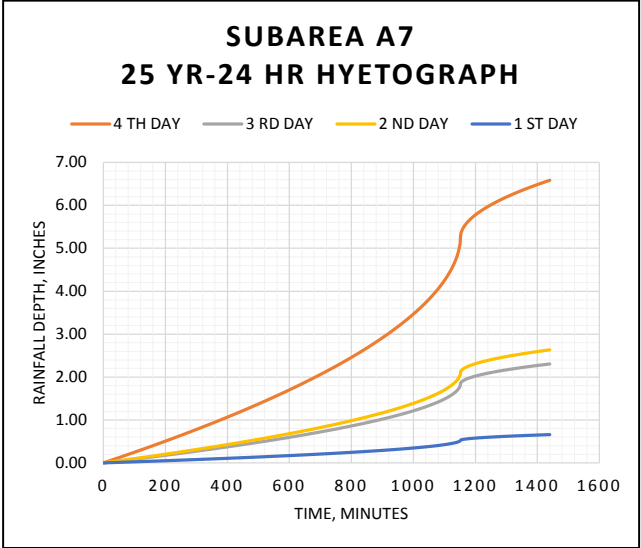
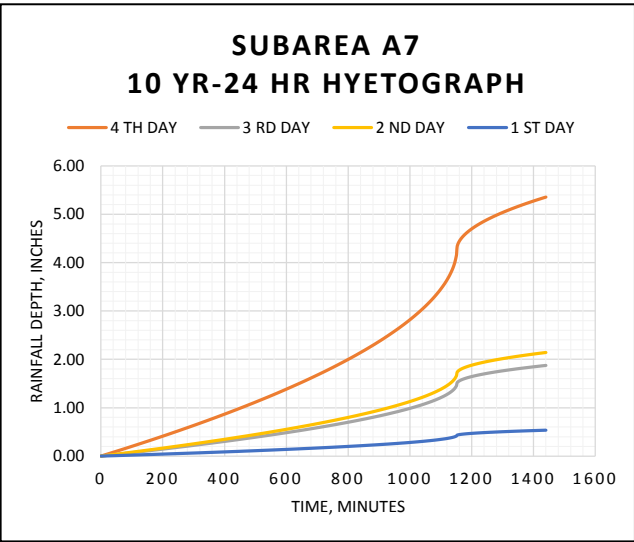
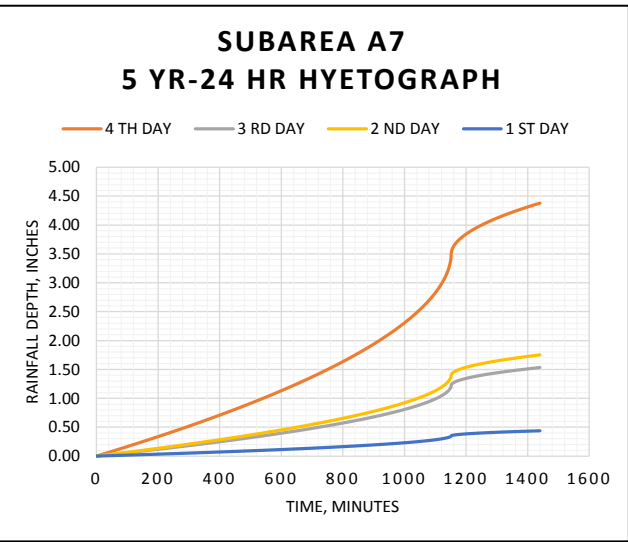
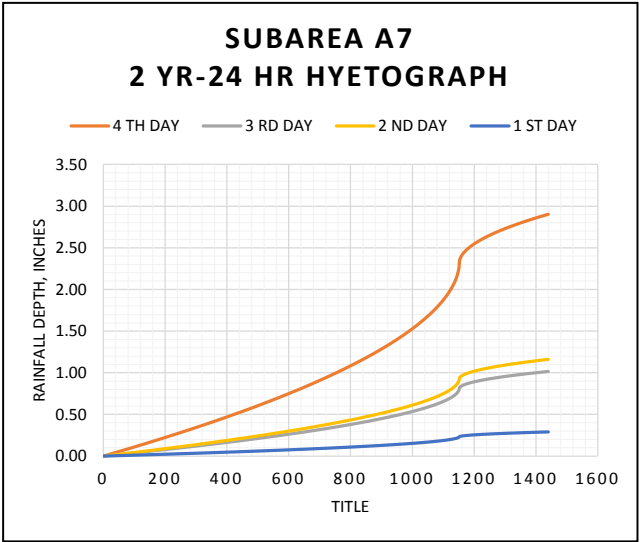
UNIT HYTOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1164	0.84	6.19	2.17	2.48	0.62	2.40	0.84	0.96	0.24	3.62	1.27	1.45	0.36	4.42	1.55	1.77	0.44	5.44	1.90	2.18	0.54	6.95	2.43	2.78	0.70
1165	0.84	6.21	2.17	2.48	0.62	2.40	0.84	0.96	0.24	3.62	1.27	1.45	0.36	4.43	1.55	1.77	0.44	5.45	1.91	2.18	0.54	6.96	2.44	2.79	0.70
1166	0.84	6.22	2.18	2.49	0.62	2.41	0.84	0.96	0.24	3.63	1.27	1.45	0.36	4.44	1.55	1.78	0.44	5.46	1.91	2.18	0.55	6.98	2.44	2.79	0.70
1167	0.84	6.23	2.18	2.49	0.62	2.41	0.84	0.96	0.24	3.64	1.27	1.46	0.36	4.45	1.56	1.78	0.44	5.47	1.91	2.19	0.55	6.99	2.45	2.80	0.70
1168	0.84	6.24	2.18	2.50	0.62	2.41	0.85	0.97	0.24	3.64	1.28	1.46	0.36	4.46	1.56	1.78	0.45	5.48	1.92	2.19	0.55	7.00	2.45	2.80	0.70
1169	0.84	6.25	2.19	2.50	0.63	2.42	0.85	0.97	0.24	3.65	1.28	1.46	0.37	4.46	1.56	1.79	0.45	5.49	1.92	2.20	0.55	7.01	2.45	2.81	0.70
1170	0.85	6.26	2.19	2.50	0.63	2.42	0.85	0.97	0.24	3.66	1.28	1.46	0.37	4.47	1.56	1.79	0.45	5.50	1.92	2.20	0.55	7.02	2.46	2.81	0.70
1171	0.85	6.27	2.19	2.51	0.63	2.43	0.85	0.97	0.24	3.66	1.28	1.46	0.37	4.48	1.57	1.79	0.45	5.51	1.93	2.20	0.55	7.04	2.46	2.81	0.70
1172	0.85	6.28	2.20	2.51	0.63	2.43	0.85	0.97	0.24	3.67	1.28	1.47	0.37	4.48	1.57	1.79	0.45	5.51	1.93	2.21	0.55	7.05	2.47	2.82	0.70
1173	0.85	6.29	2.20	2.52	0.63	2.43	0.85	0.97	0.24	3.67	1.29	1.47	0.37	4.49	1.57	1.80	0.45	5.52	1.93	2.21	0.55	7.06	2.47	2.82	0.71
1174	0.85	6.30	2.20	2.52	0.63	2.44	0.85	0.98	0.24	3.68	1.29	1.47	0.37	4.50	1.57	1.80	0.45	5.53	1.94	2.21	0.55	7.07	2.47	2.83	0.71
1175	0.85	6.31	2.21	2.52	0.63	2.44	0.85	0.98	0.24	3.68	1.29	1.47	0.37	4.50	1.58	1.80	0.45	5.54	1.94	2.22	0.55	7.08	2.48	2.83	0.71
1176	0.85	6.32	2.21	2.53	0.63	2.44	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.51	1.58	1.80	0.45	5.55	1.94	2.22	0.55	7.09	2.48	2.83	0.71
1177	0.85	6.33	2.21	2.53	0.63	2.45	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.55	1.94	2.22	0.56	7.10	2.48	2.84	0.71
1178	0.86	6.33	2.22	2.53	0.63	2.45	0.86	0.98	0.25	3.70	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.56	1.95	2.22	0.56	7.11	2.49	2.84	0.71
1179	0.86	6.34	2.22	2.54	0.63	2.45	0.86	0.98	0.25	3.70	1.30	1.48	0.37	4.53	1.58	1.81	0.45	5.57	1.95	2.23	0.56	7.12	2.49	2.85	0.71
1180	0.86	6.35	2.22	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.53	1.59	1.81	0.45	5.58	1.95	2.23	0.56	7.13	2.49	2.85	0.71
1181	0.86	6.36	2.23	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.49	0.37	4.54	1.59	1.82	0.45	5.58	1.95	2.23	0.56	7.13	2.50	2.85	0.71
1182	0.86	6.37	2.23	2.55	0.64	2.46	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.45	5.59	1.96	2.24	0.56	7.14	2.50	2.86	0.71
1183	0.86	6.37	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.15	2.50	2.86	0.72
1184	0.86	6.38	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.73	1.30	1.49	0.37	4.56	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.16	2.51	2.86	0.72
1185	0.86	6.39	2.24	2.56	0.64	2.47	0.87	0.99	0.25	3.73	1.31	1.49	0.37	4.56	1.60	1.82	0.46	5.61	1.96	2.24	0.56	7.17	2.51	2.87	0.72
1186	0.86	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.49	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.18	2.51	2.87	0.72
1187	0.87	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.19	2.51	2.87	0.72
1188	0.87	6.41	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.63	1.97	2.25	0.56	7.19	2.52	2.88	0.72
1189	0.87	6.42	2.25	2.57	0.64	2.48	0.87	0.99	0.25	3.75	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.64	1.97	2.25	0.56	7.20	2.52	2.88	0.72
1190	0.87	6.43	2.25	2.57	0.64	2.49	0.87	0.99	0.25	3.75	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.64	1.97	2.26	0.56	7.21	2.52	2.88	0.72
1191	0.87	6.43	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.76	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.65	1.98	2.26	0.56	7.22	2.53	2.89	0.72
1192	0.87	6.44	2.25	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.50	0.38	4.60	1.61	1.84	0.46	5.65	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1193	0.87	6.45	2.26	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.51	0.38	4.60	1.61	1.84	0.46	5.66	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1194	0.87	6.45	2.26	2.58	0.65	2.50	0.87	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.84	0.46	5.67	1.98	2.27	0.57	7.24	2.53	2.90	0.72
1195	0.87	6.46	2.26	2.58	0.65	2.50	0.88	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.85	0.46	5.67	1.99	2.27	0.57	7.25	2.54	2.90	0.72
1196	0.87	6.47	2.26	2.59	0.65	2.50	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.90	0.73
1197	0.87	6.47	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.91	0.73
1198	0.88	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.27	2.54	2.91	0.73
1199	0.88	6.49	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.52	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.28	2.55	2.91	0.73
1200	0.88	6.49	2.27	2.60	0.65	2.51	0.88	1.01	0.25	3.79	1.33	1.52	0.38	4.64	1.62	1.85	0.46	5.70	2.00	2.28	0.57	7.28	2.55	2.91	0.73
1201	0.88	6.50	2.27	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.62	1.86	0.46	5.71	2.00	2.28	0.57	7.29	2.55	2.92	0.73
1202	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.63	1.86	0.46	5.71	2.00	2.28	0.57	7.30	2.55	2.92	0.73
1203	0.88	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.65	1.63	1.86	0.46	5.72	2.00	2.29	0.57	7.31	2.56	2.92	0.73
1204	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.65	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.31	2.56	2.93	0.73
1205	0.88	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.73	2.00	2.29	0.57	7.32	2.56	2.93	0.73
1206	0.88	6.53	2.29	2.61	0.65	2.53	0.88	1.01	0.25	3.81	1.33	1.53	0.38	4.66	1.63	1.86	0.47	5.73	2.01	2.29	0.57	7.33	2.56	2.93	0.73
1207	0.88	6.54	2.29	2.61	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.33	2.57	2.93	0.73
1208	0.88	6.54	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.34	2.57	2.94	0.73
1209	0.88	6.55	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.64	1.87	0.47	5.75	2.01	2.30	0.57	7.35	2.57	2.94	0.73
1210	0.89	6.55	2.29	2.62	0.66	2.54	0.89	1.01	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.75	2.01	2.30	0.58	7.35	2.57	2.94	0.74
1211	0.89	6.56	2.30	2.62	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.76	2.02	2.30	0.58	7.36	2.58	2.94	0.74
1212	0.89	6.56	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.69	1.64	1.87	0.47	5.76	2.02	2.31	0.58	7.37	2.58	2.95	0.74
1213	0.89	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.53	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.37	2.58	2.95	0.74

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1224	0.90	6.63	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.44	2.60	2.98	0.74
1225	0.90	6.64	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.74	1.66	1.89	0.47	5.83	2.04	2.33	0.58	7.44	2.61	2.98	0.74
1226	0.90	6.64	2.32	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.75
1227	0.90	6.65	2.33	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.46	2.61	2.98	0.75
1228	0.90	6.65	2.33	2.66	0.67	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.75	1.66	1.90	0.47	5.84	2.04	2.34	0.58	7.46	2.61	2.98	0.75
1229	0.90	6.66	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.55	0.39	4.75	1.66	1.90	0.48	5.84	2.05	2.34	0.58	7.47	2.61	2.99	0.75
1230	0.90	6.66	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.76	1.66	1.90	0.48	5.85	2.05	2.34	0.58	7.47	2.62	2.99	0.75
1231	0.90	6.67	2.33	2.67	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.76	1.67	1.90	0.48	5.85	2.05	2.34	0.59	7.48	2.62	2.99	0.75
1232	0.90	6.67	2.33	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.76	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.48	2.62	2.99	0.75
1233	0.90	6.68	2.34	2.67	0.67	2.58	0.90	1.03	0.26	3.90	1.36	1.56	0.39	4.77	1.67	1.91	0.48	5.86	2.05	2.34	0.59	7.49	2.62	3.00	0.75
1234	0.90	6.68	2.34	2.67	0.67	2.59	0.90	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.62	3.00	0.75
1235	0.90	6.69	2.34	2.67	0.67	2.59	0.91	1.03	0.26	3.90	1.37	1.56	0.39	4.77	1.67	1.91	0.48	5.87	2.05	2.35	0.59	7.50	2.63	3.00	0.75
1240	0.91	6.71	2.35	2.68	0.67	2.60	0.91	1.04	0.26	3.92	1.37	1.57	0.39	4.79	1.68	1.92	0.48	5.89	2.06	2.36	0.59	7.53	2.63	3.01	0.75
1245	0.91	6.73	2.36	2.69	0.67	2.61	0.91	1.04	0.26	3.93	1.38	1.57	0.39	4.81	1.68	1.92	0.48	5.91	2.07	2.36	0.59	7.55	2.64	3.02	0.76
1250	0.91	6.76	2.36	2.70	0.68	2.61	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.08	2.37	0.59	7.58	2.65	3.03	0.76
1255	0.92	6.78	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.96	1.39	1.58	0.40	4.84	1.69	1.94	0.48	5.95	2.08	2.38	0.60	7.61	2.66	3.04	0.76
1260	0.92	6.80	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.86	1.70	1.94	0.49	5.97	2.09	2.39	0.60	7.63	2.67	3.05	0.76
1265	0.92	6.82	2.39	2.73	0.68	2.64	0.92	1.06	0.26	3.98	1.39	1.59	0.40	4.87	1.70	1.95	0.49	5.99	2.10	2.40	0.60	7.65	2.68	3.06	0.77
1270	0.92	6.84	2.39	2.74	0.68	2.65	0.93	1.06	0.26	4.00	1.40	1.60	0.40	4.89	1.71	1.95	0.49	6.01	2.10	2.40	0.60	7.68	2.69	3.07	0.77
1275	0.93	6.86	2.40	2.75	0.69	2.66	0.93	1.06	0.27	4.01	1.40	1.60	0.40	4.90	1.72	1.96	0.49	6.03	2.11	2.41	0.60	7.70	2.70	3.08	0.77
1280	0.93	6.88	2.41	2.75	0.69	2.66	0.93	1.07	0.27	4.02	1.41	1.61	0.40	4.91	1.72	1.97	0.49	6.04	2.12	2.42	0.60	7.72	2.70	3.09	0.77
1285	0.93	6.90	2.42	2.76	0.69	2.67	0.93	1.07	0.27	4.03	1.41	1.61	0.40	4.93	1.72	1.97	0.49	6.06	2.12	2.42	0.61	7.74	2.71	3.10	0.77
1290	0.94	6.92	2.42	2.77	0.69	2.68	0.94	1.07	0.27	4.04	1.41	1.62	0.40	4.94	1.73	1.98	0.49	6.08	2.13	2.43	0.61	7.77	2.72	3.11	0.78
1295	0.94	6.94	2.43	2.78	0.69	2.69	0.94	1.07	0.27	4.05	1.42	1.62	0.41	4.96	1.73	1.98	0.50	6.09	2.13	2.44	0.61	7.79	2.73	3.12	0.78
1300	0.94	6.96	2.44	2.78	0.70	2.69	0.94	1.08	0.27	4.06	1.42	1.63	0.41	4.97	1.74	1.99	0.50	6.11	2.14	2.44	0.61	7.81	2.73	3.12	0.78
1305	0.94	6.98	2.44	2.79	0.70	2.70	0.95	1.08	0.27	4.08	1.43	1.63	0.41	4.98	1.74	1.99	0.50	6.13	2.14	2.45	0.61	7.83	2.74	3.13	0.78
1310	0.95	7.00	2.45	2.80	0.70	2.71	0.95	1.08	0.27	4.09	1.43	1.63	0.41	5.00	1.75	2.00	0.50	6.14	2.15	2.46	0.61	7.85	2.75	3.14	0.79
1315	0.95	7.01	2.46	2.81	0.70	2.71	0.95	1.09	0.27	4.10	1.43	1.64	0.41	5.01	1.75	2.00	0.50	6.16	2.16	2.46	0.62	7.87	2.75	3.15	0.79
1320	0.95	7.03	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.11	1.44	1.64	0.41	5.02	1.76	2.01	0.50	6.17	2.16	2.47	0.62	7.89	2.76	3.16	0.79
1325	0.95	7.05	2.47	2.82	0.70	2.73	0.95	1.09	0.27	4.12	1.44	1.65	0.41	5.03	1.76	2.01	0.50	6.19	2.17	2.48	0.62	7.91	2.77	3.16	0.79
1330	0.95	7.07	2.47	2.83	0.71	2.73	0.96	1.09	0.27	4.13	1.44	1.65	0.41	5.05	1.77	2.02	0.50	6.20	2.17	2.48	0.62	7.93	2.78	3.17	0.79
1335	0.96	7.08	2.48	2.83	0.71	2.74	0.96	1.10	0.27	4.14	1.45	1.65	0.41	5.06	1.77	2.02	0.51	6.22	2.18	2.49	0.62	7.95	2.78	3.18	0.79
1340	0.96	7.10	2.49	2.84	0.71	2.75	0.96	1.10	0.27	4.15	1.45	1.66	0.41	5.07	1.77	2.03	0.51	6.23	2.18	2.49	0.62	7.97	2.79	3.19	0.80
1345	0.96	7.12	2.49	2.85	0.71	2.75	0.96	1.10	0.28	4.16	1.45	1.66	0.42	5.08	1.78	2.03	0.51	6.25	2.19	2.50	0.62	7.99	2.79	3.19	0.80
1350	0.96	7.13	2.50	2.85	0.71	2.76	0.97	1.10	0.28	4.17	1.46	1.67	0.42	5.09	1.78	2.04	0.51	6.26	2.19	2.51	0.63	8.00	2.80	3.20	0.80
1355	0.97	7.15	2.50	2.86	0.71	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.10	1.79	2.04	0.51	6.28	2.20	2.51	0.63	8.02	2.81	3.21	0.80
1360	0.97	7.17	2.51	2.87	0.72	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.12	1.79	2.05	0.51	6.29	2.20	2.52	0.63	8.04	2.81	3.22	0.80
1365	0.97	7.18	2.51	2.87	0.72	2.78	0.97	1.11	0.28	4.19	1.47	1.68	0.42	5.13	1.79	2.05	0.51	6.31	2.21	2.52	0.63	8.06	2.82	3.22	0.81
1370	0.97	7.20	2.52	2.88	0.72	2.79	0.97	1.11	0.28	4.20	1.47	1.68	0.42	5.14	1.80	2.06	0.51	6.32	2.21	2.53	0.63	8.07	2.83	3.23	0.81
1375	0.97	7.21	2.52	2.88	0.72	2.79	0.98	1.12	0.28	4.21	1.47	1.68	0.42	5.15	1.80	2.06	0.51	6.33	2.22	2.53	0.63	8.09	2.83	3.24	0.81
1380	0.98	7.23	2.53	2.89	0.72	2.80	0.98	1.12	0.28	4.22	1.48	1.69	0.42	5.16	1.81	2.06	0.52	6.35	2.22	2.54	0.63	8.11	2.84	3.24	0.81
1385	0.98	7.24	2.53	2.90	0.72	2.80	0.98	1.12	0.28	4.23	1.48	1.69	0.42	5.17	1.81	2.07	0.52	6.36	2.23	2.54	0.64	8.13	2.84	3.25	0.81
1390	0.98	7.26	2.54	2.90	0.73	2.81	0.98	1.12	0.28	4.24	1.48	1.70	0.42	5.18	1.81	2.07	0.52	6.37	2.23	2.55	0.64	8.14	2.85	3.26	0.81
1395	0.98	7.27	2.55	2.91	0.73	2.81	0.99	1.13	0.28	4.25	1.49	1.70	0.42	5.19	1.82	2.08	0.52	6.39	2.23	2.55	0.64	8.16	2.86	3.26	0.82
1400	0.98	7.29	2.55	2.91	0.73	2.82	0.99	1.13	0.28	4.26	1.49	1.70	0.43	5.20	1.82	2.08	0.52	6.40	2.24	2.56	0.64	8.18	2.86	3.27	0.82
1405	0.99	7.30	2.56	2.92	0.73	2.83	0.99	1.13	0.28	4.26	1.49	1.71	0.43	5.21	1.82	2.09	0.52	6.41	2.24	2.56	0.64	8.19	2.87	3.28	0.82
1410	0.99	7.32	2.56	2.93	0.73	2.83	0.99	1.13	0.28	4.27	1.50	1.71	0.43	5.22	1.83	2.09	0.52	6.42	2.25	2.57	0.64	8.21	2.87	3.28	0.82
1415	0.99	7.33	2.57	2.93	0.73	2.84	0.99	1.13	0.28	4.28	1.50	1.71	0.43	5.23	1.83	2.09	0.52	6.44	2.25	2.57	0.64	8.22	2.88	3.29	0.82
1420	0.99	7.34	2.57	2.94	0.73	2.84	0.99	1.14	0.28	4.29	1.50	1.72	0.43	5.24	1.84	2.10	0.52	6.45	2.26	2.58	0.64	8.24	2.88	3.30	0.82
1425																									

SUBAREA A7 HYETOPRAPHS

- Per 2006 Los Angeles County Hydrology Manual Appendix A

24 HR ISOHYETS,IN					
50 YR	2 YR	5 YR	10 YR	25 YR	100 YR
7.5	2.9	4.4	5.4	6.6	8.4



UNIT HYETOGRAPH		50 YR - 24 HR					2 YR - 24 HR					5 YR - 24 HR					10 YR - 24 HR					25 YR - 24 HR					100 YR - 24 HR				
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth				
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY		
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
30	0.01	0.08	0.03	0.03	0.01	0.03	0.01	0.01	0.00	0.05	0.02	0.02	0.00	0.06	0.02	0.02	0.01	0.07	0.03	0.03	0.01	0.09	0.03	0.04	0.01	0.09	0.03	0.04	0.01		
60	0.02	0.17	0.06	0.07	0.02	0.06	0.02	0.03	0.01	0.10	0.03	0.04	0.01	0.12	0.04	0.05	0.01	0.15	0.05	0.06	0.01	0.19	0.07	0.08	0.02	0.19	0.07	0.08	0.02		
90	0.03	0.25	0.09	0.10	0.03	0.10	0.03	0.04	0.01	0.15	0.05	0.06	0.01	0.18	0.06	0.07	0.02	0.22	0.08	0.09	0.02	0.28	0.10	0.11	0.03	0.28	0.10	0.11	0.03		
120	0.05	0.34	0.12	0.14	0.03	0.13	0.05	0.05	0.01	0.20	0.07	0.08	0.02	0.24	0.08	0.10	0.02	0.30	0.10	0.12	0.03	0.38	0.13	0.15	0.04	0.38	0.13	0.15	0.04		
150	0.06	0.43	0.15	0.17	0.04	0.17	0.06	0.07	0.02	0.25	0.09	0.10	0.02	0.31	0.11	0.12	0.03	0.38	0.13	0.15	0.04	0.48	0.17	0.19	0.05	0.48	0.17	0.19	0.05		
180	0.07	0.52	0.18	0.21	0.05	0.20	0.07	0.08	0.02	0.30	0.11	0.12	0.03	0.37	0.13	0.15	0.04	0.45	0.16	0.18	0.05	0.58	0.20	0.23	0.06	0.58	0.20	0.23	0.06		
210	0.08	0.61	0.21	0.24	0.06	0.23	0.08	0.09	0.02	0.35	0.12	0.14	0.04	0.43	0.15	0.17	0.04	0.53	0.19	0.21	0.05	0.68	0.24	0.27	0.07	0.68	0.24	0.27	0.07		
240	0.09	0.70	0.24	0.28	0.07	0.27	0.09	0.11	0.03	0.41	0.14	0.16	0.04	0.50	0.17	0.20	0.05	0.61	0.21	0.25	0.06	0.78	0.27	0.31	0.08	0.78	0.27	0.31	0.08		
270	0.11	0.79	0.28	0.32	0.08	0.31	0.11	0.12	0.03	0.46	0.16	0.18	0.05	0.57	0.20	0.23	0.06	0.70	0.24	0.28	0.07	0.89	0.31	0.36	0.09	0.89	0.31	0.36	0.09		
300	0.12	0.89	0.31	0.35	0.09	0.34	0.12	0.14	0.03	0.52	0.18	0.21	0.05	0.63	0.22	0.25	0.06	0.78	0.27	0.31	0.08	0.99	0.35	0.40	0.10	0.99	0.35	0.40	0.10		
330	0.13	0.98	0.34	0.39	0.10	0.38	0.13	0.15	0.04	0.57	0.20	0.23	0.06	0.70	0.25	0.28	0.07	0.86	0.30	0.35	0.09	1.10	0.39	0.44	0.11	1.10	0.39	0.44	0.11		
360	0.14	1.08	0.38	0.43	0.11	0.42	0.15	0.17	0.04	0.63	0.22	0.25	0.06	0.77	0.27	0.31	0.08	0.95	0.33	0.38	0.09	1.21	0.42	0.49	0.12	1.21	0.42	0.49	0.12		

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
390	0.16	1.18	0.41	0.47	0.12	0.46	0.16	0.18	0.05	0.69	0.24	0.28	0.07	0.84	0.29	0.34	0.08	1.04	0.36	0.41	0.10	1.32	0.46	0.53	0.13
420	0.17	1.28	0.45	0.51	0.13	0.50	0.17	0.20	0.05	0.75	0.26	0.30	0.07	0.92	0.32	0.37	0.09	1.13	0.39	0.45	0.11	1.44	0.50	0.58	0.14
450	0.18	1.39	0.48	0.55	0.14	0.54	0.19	0.21	0.05	0.81	0.28	0.32	0.08	0.99	0.35	0.40	0.10	1.22	0.43	0.49	0.12	1.55	0.54	0.62	0.16
480	0.20	1.49	0.52	0.60	0.15	0.58	0.20	0.23	0.06	0.87	0.30	0.35	0.09	1.06	0.37	0.43	0.11	1.31	0.46	0.52	0.13	1.67	0.59	0.67	0.17
510	0.21	1.60	0.56	0.64	0.16	0.62	0.22	0.25	0.06	0.93	0.33	0.37	0.09	1.14	0.40	0.46	0.11	1.40	0.49	0.56	0.14	1.79	0.63	0.72	0.18
540	0.23	1.71	0.60	0.68	0.17	0.66	0.23	0.26	0.07	1.00	0.35	0.40	0.10	1.22	0.43	0.49	0.12	1.50	0.53	0.60	0.15	1.92	0.67	0.77	0.19
570	0.24	1.82	0.64	0.73	0.18	0.71	0.25	0.28	0.07	1.06	0.37	0.43	0.11	1.30	0.46	0.52	0.13	1.60	0.56	0.64	0.16	2.04	0.72	0.82	0.20
600	0.26	1.94	0.68	0.77	0.19	0.75	0.26	0.30	0.07	1.13	0.40	0.45	0.11	1.38	0.48	0.55	0.14	1.70	0.60	0.68	0.17	2.17	0.76	0.87	0.22
630	0.27	2.06	0.72	0.82	0.21	0.80	0.28	0.32	0.08	1.20	0.42	0.48	0.12	1.47	0.51	0.59	0.15	1.81	0.63	0.72	0.18	2.31	0.81	0.92	0.23
660	0.29	2.18	0.76	0.87	0.22	0.84	0.29	0.34	0.08	1.27	0.45	0.51	0.13	1.55	0.54	0.62	0.16	1.91	0.67	0.76	0.19	2.44	0.86	0.98	0.24
690	0.31	2.30	0.81	0.92	0.23	0.89	0.31	0.36	0.09	1.34	0.47	0.54	0.13	1.64	0.58	0.66	0.16	2.02	0.71	0.81	0.20	2.58	0.90	1.03	0.26
720	0.32	2.43	0.85	0.97	0.24	0.94	0.33	0.38	0.09	1.42	0.50	0.57	0.14	1.74	0.61	0.69	0.17	2.14	0.75	0.85	0.21	2.73	0.96	1.09	0.27
750	0.34	2.57	0.90	1.03	0.26	0.99	0.35	0.40	0.10	1.50	0.52	0.60	0.15	1.83	0.64	0.73	0.18	2.25	0.79	0.90	0.23	2.88	1.01	1.15	0.29
780	0.36	2.70	0.95	1.08	0.27	1.05	0.37	0.42	0.10	1.58	0.55	0.63	0.16	1.93	0.68	0.77	0.19	2.37	0.83	0.95	0.24	3.03	1.06	1.21	0.30
810	0.38	2.85	1.00	1.14	0.28	1.10	0.39	0.44	0.11	1.66	0.58	0.67	0.17	2.03	0.71	0.81	0.20	2.50	0.88	1.00	0.25	3.20	1.12	1.28	0.32
840	0.40	3.00	1.05	1.20	0.30	1.16	0.41	0.46	0.12	1.75	0.61	0.70	0.18	2.14	0.75	0.86	0.21	2.63	0.92	1.05	0.26	3.36	1.18	1.35	0.34
870	0.42	3.15	1.10	1.26	0.32	1.22	0.43	0.49	0.12	1.84	0.64	0.74	0.18	2.25	0.79	0.90	0.23	2.77	0.97	1.11	0.28	3.54	1.24	1.42	0.35
900	0.44	3.32	1.16	1.33	0.33	1.28	0.45	0.51	0.13	1.94	0.68	0.78	0.19	2.37	0.83	0.95	0.24	2.91	1.02	1.17	0.29	3.72	1.30	1.49	0.37
930	0.47	3.49	1.22	1.40	0.35	1.35	0.47	0.54	0.14	2.04	0.71	0.82	0.20	2.49	0.87	1.00	0.25	3.07	1.07	1.23	0.31	3.92	1.37	1.57	0.39
960	0.49	3.68	1.29	1.47	0.37	1.42	0.50	0.57	0.14	2.15	0.75	0.86	0.21	2.63	0.92	1.05	0.26	3.23	1.13	1.29	0.32	4.13	1.44	1.65	0.41
970	0.50	3.74	1.31	1.50	0.37	1.45	0.51	0.58	0.14	2.19	0.77	0.87	0.22	2.67	0.94	1.07	0.27	3.29	1.15	1.31	0.33	4.20	1.47	1.68	0.42
980	0.51	3.81	1.33	1.52	0.38	1.47	0.52	0.59	0.15	2.23	0.78	0.89	0.22	2.72	0.95	1.09	0.27	3.35	1.17	1.34	0.33	4.28	1.50	1.71	0.43
990	0.52	3.88	1.36	1.55	0.39	1.50	0.53	0.60	0.15	2.27	0.79	0.91	0.23	2.77	0.97	1.11	0.28	3.41	1.19	1.36	0.34	4.35	1.52	1.74	0.44
1000	0.53	3.95	1.38	1.58	0.39	1.53	0.53	0.61	0.15	2.31	0.81	0.92	0.23	2.82	0.99	1.13	0.28	3.47	1.21	1.39	0.35	4.43	1.55	1.77	0.44
1010	0.54	4.02	1.41	1.61	0.40	1.56	0.54	0.62	0.16	2.35	0.82	0.94	0.23	2.87	1.01	1.15	0.29	3.53	1.24	1.41	0.35	4.51	1.58	1.80	0.45
1020	0.55	4.10	1.43	1.64	0.41	1.59	0.55	0.63	0.16	2.39	0.84	0.96	0.24	2.93	1.02	1.17	0.29	3.60	1.26	1.44	0.36	4.60	1.61	1.84	0.46
1030	0.56	4.17	1.46	1.67	0.42	1.62	0.57	0.65	0.16	2.44	0.85	0.98	0.24	2.98	1.04	1.19	0.30	3.67	1.28	1.47	0.37	4.68	1.64	1.87	0.47
1040	0.57	4.26	1.49	1.70	0.43	1.65	0.58	0.66	0.16	2.49	0.87	0.99	0.25	3.04	1.06	1.22	0.30	3.74	1.31	1.49	0.37	4.77	1.67	1.91	0.48
1050	0.58	4.34	1.52	1.74	0.43	1.68	0.59	0.67	0.17	2.53	0.89	1.01	0.25	3.10	1.08	1.24	0.31	3.81	1.33	1.52	0.38	4.87	1.70	1.95	0.49
1060	0.59	4.43	1.55	1.77	0.44	1.71	0.60	0.69	0.17	2.59	0.91	1.03	0.26	3.16	1.11	1.26	0.32	3.89	1.36	1.56	0.39	4.97	1.74	1.99	0.50
1070	0.60	4.52	1.58	1.81	0.45	1.75	0.61	0.70	0.17	2.64	0.92	1.06	0.26	3.23	1.13	1.29	0.32	3.97	1.39	1.59	0.40	5.07	1.78	2.03	0.51
1080	0.62	4.62	1.62	1.85	0.46	1.79	0.63	0.72	0.18	2.70	0.94	1.08	0.27	3.30	1.15	1.32	0.33	4.06	1.42	1.62	0.41	5.18	1.81	2.07	0.52
1090	0.63	4.72	1.65	1.89	0.47	1.83	0.64	0.73	0.18	2.76	0.97	1.10	0.28	3.37	1.18	1.35	0.34	4.15	1.45	1.66	0.41	5.30	1.86	2.12	0.53
1100	0.65	4.84	1.69	1.94	0.48	1.87	0.66	0.75	0.19	2.83	0.99	1.13	0.28	3.45	1.21	1.38	0.35	4.25	1.49	1.70	0.42	5.43	1.90	2.17	0.54
1110	0.66	4.96	1.74	1.99	0.50	1.92	0.67	0.77	0.19	2.90	1.01	1.16	0.29	3.54	1.24	1.42	0.35	4.36	1.53	1.74	0.44	5.57	1.95	2.23	0.56
1115	0.67	5.03	1.76	2.01	0.50	1.95	0.68	0.78	0.19	2.94	1.03	1.18	0.29	3.59	1.26	1.44	0.36	4.42	1.55	1.77	0.44	5.64	1.98	2.26	0.56
1120	0.68	5.10	1.79	2.04	0.51	1.97	0.69	0.79	0.20	2.98	1.04	1.19	0.30	3.64	1.27	1.46	0.36	4.48	1.57	1.79	0.45	5.72	2.00	2.29	0.57
1125	0.69	5.18	1.81	2.07	0.52	2.00	0.70	0.80	0.20	3.02	1.06	1.21	0.30	3.70	1.29	1.48	0.37	4.55	1.59	1.82	0.45	5.81	2.03	2.32	0.58
1130	0.70	5.26	1.84	2.11	0.53	2.04	0.71	0.81	0.20	3.07	1.08	1.23	0.31	3.76	1.32	1.50	0.38	4.62	1.62	1.85	0.46	5.91	2.07	2.36	0.59
1135	0.71	5.36	1.88	2.14	0.54	2.07	0.73	0.83	0.21	3.13	1.10	1.25	0.31	3.83	1.34	1.53	0.38	4.70	1.65	1.88	0.47	6.01	2.10	2.40	0.60
1136	0.72	5.38	1.88	2.15	0.54	2.08	0.73	0.83	0.21	3.14	1.10	1.26	0.31	3.84	1.34	1.54	0.38	4.72	1.65	1.89	0.47	6.03	2.11	2.41	0.60
1137	0.72	5.40	1.89	2.16	0.54	2.09	0.73	0.84	0.21	3.15	1.10	1.26	0.32	3.85	1.35	1.54	0.39	4.74	1.66	1.90	0.47	6.06	2.12	2.42	0.61
1138	0.72	5.42	1.90	2.17	0.54	2.10	0.73	0.84	0.21	3.17	1.11	1.27	0.32	3.87	1.35	1.55	0.39	4.76	1.67	1.90	0.48	6.08	2.13	2.43	0.61
1139	0.73	5.44	1.90	2.18	0.54	2.11	0.74	0.84	0.21	3.18	1.11	1.27	0.32	3.89	1.36	1.55	0.39	4.78	1.67	1.91	0.48	6.11	2.14	2.44	0.61
1140	0.73	5.47	1.91	2.19	0.55	2.12	0.74	0.85	0.21	3.19	1.12	1.28	0.32	3.90	1.37	1.56	0.39	4.80	1.68	1.92	0.48	6.13	2.15	2.45	0.61
1145	0.75	5.60	1.96	2.24	0.56	2.17	0.76	0.87	0.22	3.27	1.14	1.31	0.33	4.00	1.40	1.60	0.40	4.92	1.72	1.97	0.49	6.28	2.20	2.51	0.63
1150	0.77	5.79	2.03	2.32	0.58	2.24	0.78	0.90	0.22	3.38	1.18	1.35	0.34	4.14	1.45	1.65	0.41	5.09	1.78	2.03	0.51	6.50	2.28	2.60	0.65
1151	0.78	5.86	2.05	2.34	0.59	2.27	0.79	0.91	0.23	3.42	1.20	1.37	0.34	4.18	1.46	1.67	0.42	5.14	1.80	2.06	0.51	6.57	2.30	2.63	0.66
1152	0.80	6.00	2.10	2.40	0.60	2.32	0.81	0.93	0.23	3.50	1.23	1.40	0.35	4.28	1.50	1.71	0.43	5.27	1.84	2.11	0.53	6.73	2.36	2.69	0.67
1153	0.81	6.07	2.																						

UNIT HYDROGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1164	0.84	6.28	2.20	2.51	0.63	2.43	0.85	0.97	0.24	3.67	1.28	1.47	0.37	4.48	1.57	1.79	0.45	5.51	1.93	2.20	0.55	7.04	2.47	2.82	0.70
1165	0.84	6.29	2.20	2.52	0.63	2.43	0.85	0.97	0.24	3.67	1.29	1.47	0.37	4.49	1.57	1.80	0.45	5.52	1.93	2.21	0.55	7.06	2.47	2.82	0.71
1166	0.84	6.30	2.21	2.52	0.63	2.44	0.85	0.98	0.24	3.68	1.29	1.47	0.37	4.50	1.57	1.80	0.45	5.53	1.94	2.21	0.55	7.07	2.47	2.83	0.71
1167	0.84	6.31	2.21	2.53	0.63	2.44	0.86	0.98	0.24	3.69	1.29	1.47	0.37	4.51	1.58	1.80	0.45	5.54	1.94	2.22	0.55	7.08	2.48	2.83	0.71
1168	0.84	6.32	2.21	2.53	0.63	2.45	0.86	0.98	0.24	3.69	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.55	1.94	2.22	0.56	7.10	2.48	2.84	0.71
1169	0.84	6.33	2.22	2.53	0.63	2.45	0.86	0.98	0.25	3.70	1.29	1.48	0.37	4.52	1.58	1.81	0.45	5.56	1.95	2.22	0.56	7.11	2.49	2.84	0.71
1170	0.85	6.35	2.22	2.54	0.63	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.53	1.59	1.81	0.45	5.57	1.95	2.23	0.56	7.12	2.49	2.85	0.71
1171	0.85	6.36	2.22	2.54	0.64	2.46	0.86	0.98	0.25	3.71	1.30	1.48	0.37	4.54	1.59	1.82	0.45	5.58	1.95	2.23	0.56	7.13	2.50	2.85	0.71
1172	0.85	6.36	2.23	2.55	0.64	2.46	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.54	1.59	1.82	0.45	5.59	1.96	2.24	0.56	7.14	2.50	2.86	0.71
1173	0.85	6.37	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.72	1.30	1.49	0.37	4.55	1.59	1.82	0.46	5.60	1.96	2.24	0.56	7.15	2.50	2.86	0.72
1174	0.85	6.38	2.23	2.55	0.64	2.47	0.86	0.99	0.25	3.73	1.30	1.49	0.37	4.56	1.60	1.82	0.46	5.60	1.96	2.24	0.56	7.16	2.51	2.87	0.72
1175	0.85	6.39	2.24	2.56	0.64	2.47	0.87	0.99	0.25	3.73	1.31	1.49	0.37	4.56	1.60	1.83	0.46	5.61	1.96	2.25	0.56	7.17	2.51	2.87	0.72
1176	0.85	6.40	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.57	1.60	1.83	0.46	5.62	1.97	2.25	0.56	7.18	2.51	2.87	0.72
1177	0.85	6.41	2.24	2.56	0.64	2.48	0.87	0.99	0.25	3.74	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.63	1.97	2.25	0.56	7.19	2.52	2.88	0.72
1178	0.86	6.42	2.25	2.57	0.64	2.48	0.87	0.99	0.25	3.75	1.31	1.50	0.37	4.58	1.60	1.83	0.46	5.64	1.97	2.25	0.56	7.20	2.52	2.88	0.72
1179	0.86	6.43	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.75	1.31	1.50	0.38	4.59	1.61	1.84	0.46	5.64	1.98	2.26	0.56	7.21	2.52	2.88	0.72
1180	0.86	6.44	2.25	2.57	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.50	0.38	4.60	1.61	1.84	0.46	5.65	1.98	2.26	0.57	7.22	2.53	2.89	0.72
1181	0.86	6.44	2.26	2.58	0.64	2.49	0.87	1.00	0.25	3.76	1.32	1.51	0.38	4.60	1.61	1.84	0.46	5.66	1.98	2.26	0.57	7.23	2.53	2.89	0.72
1182	0.86	6.45	2.26	2.58	0.65	2.50	0.87	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.84	0.46	5.67	1.98	2.27	0.57	7.24	2.53	2.90	0.72
1183	0.86	6.46	2.26	2.58	0.65	2.50	0.88	1.00	0.25	3.77	1.32	1.51	0.38	4.61	1.61	1.85	0.46	5.67	1.99	2.27	0.57	7.25	2.54	2.90	0.72
1184	0.86	6.47	2.26	2.59	0.65	2.50	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.68	1.99	2.27	0.57	7.26	2.54	2.90	0.73
1185	0.86	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.78	1.32	1.51	0.38	4.62	1.62	1.85	0.46	5.69	1.99	2.27	0.57	7.27	2.54	2.91	0.73
1186	0.86	6.48	2.27	2.59	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.51	0.38	4.63	1.62	1.85	0.46	5.69	1.99	2.28	0.57	7.27	2.55	2.91	0.73
1187	0.87	6.49	2.27	2.60	0.65	2.51	0.88	1.00	0.25	3.79	1.33	1.52	0.38	4.63	1.62	1.85	0.46	5.70	1.99	2.28	0.57	7.28	2.55	2.91	0.73
1188	0.87	6.50	2.27	2.60	0.65	2.51	0.88	1.01	0.25	3.79	1.33	1.52	0.38	4.64	1.62	1.86	0.46	5.71	2.00	2.28	0.57	7.29	2.55	2.92	0.73
1189	0.87	6.51	2.28	2.60	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.64	1.63	1.86	0.46	5.71	2.00	2.28	0.57	7.30	2.55	2.92	0.73
1190	0.87	6.51	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.80	1.33	1.52	0.38	4.65	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.31	2.56	2.92	0.73
1191	0.87	6.52	2.28	2.61	0.65	2.52	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.72	2.00	2.29	0.57	7.32	2.56	2.93	0.73
1192	0.87	6.53	2.28	2.61	0.65	2.53	0.88	1.01	0.25	3.81	1.33	1.52	0.38	4.66	1.63	1.86	0.47	5.73	2.01	2.29	0.57	7.32	2.56	2.93	0.73
1193	0.87	6.53	2.29	2.61	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.29	0.57	7.33	2.57	2.93	0.73
1194	0.87	6.54	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.63	1.87	0.47	5.74	2.01	2.30	0.57	7.34	2.57	2.94	0.73
1195	0.87	6.55	2.29	2.62	0.65	2.53	0.89	1.01	0.25	3.82	1.34	1.53	0.38	4.67	1.64	1.87	0.47	5.75	2.01	2.30	0.57	7.35	2.57	2.94	0.73
1196	0.87	6.55	2.29	2.62	0.66	2.54	0.89	1.01	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.75	2.01	2.30	0.58	7.35	2.57	2.94	0.74
1197	0.87	6.56	2.30	2.62	0.66	2.54	0.89	1.02	0.25	3.83	1.34	1.53	0.38	4.68	1.64	1.87	0.47	5.76	2.02	2.30	0.58	7.36	2.58	2.94	0.74
1198	0.88	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.53	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.37	2.58	2.95	0.74
1199	0.88	6.57	2.30	2.63	0.66	2.54	0.89	1.02	0.25	3.84	1.34	1.54	0.38	4.69	1.64	1.88	0.47	5.77	2.02	2.31	0.58	7.38	2.58	2.95	0.74
1200	0.88	6.58	2.30	2.63	0.66	2.55	0.89	1.02	0.25	3.84	1.35	1.54	0.38	4.70	1.64	1.88	0.47	5.78	2.02	2.31	0.58	7.38	2.58	2.95	0.74
1201	0.88	6.59	2.31	2.63	0.66	2.55	0.89	1.02	0.25	3.85	1.35	1.54	0.38	4.70	1.65	1.88	0.47	5.78	2.02	2.31	0.58	7.39	2.59	2.96	0.74
1202	0.88	6.59	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.39	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1203	0.88	6.60	2.31	2.64	0.66	2.55	0.89	1.02	0.26	3.85	1.35	1.54	0.39	4.71	1.65	1.88	0.47	5.79	2.03	2.32	0.58	7.40	2.59	2.96	0.74
1204	0.88	6.61	2.31	2.64	0.66	2.56	0.89	1.02	0.26	3.86	1.35	1.54	0.39	4.72	1.65	1.89	0.47	5.80	2.03	2.32	0.58	7.41	2.59	2.96	0.74
1205	0.88	6.61	2.31	2.64	0.66	2.56	0.90	1.02	0.26	3.86	1.35	1.54	0.39	4.72	1.65	1.89	0.47	5.81	2.03	2.32	0.58	7.42	2.60	2.97	0.74
1206	0.88	6.62	2.32	2.65	0.66	2.56	0.90	1.02	0.26	3.86	1.35	1.55	0.39	4.73	1.65	1.89	0.47	5.81	2.03	2.32	0.58	7.43	2.60	2.97	0.74
1207	0.88	6.62	2.32	2.65	0.66	2.56	0.90	1.03	0.26	3.87	1.35	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.43	2.60	2.97	0.74
1208	0.88	6.63	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.87	1.36	1.55	0.39	4.73	1.66	1.89	0.47	5.82	2.04	2.33	0.58	7.44	2.60	2.98	0.74
1209	0.88	6.64	2.32	2.65	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.74
1210	0.89	6.64	2.32	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.74	1.66	1.90	0.47	5.83	2.04	2.33	0.58	7.45	2.61	2.98	0.75
1211	0.89	6.65	2.33	2.66	0.66	2.57	0.90	1.03	0.26	3.88	1.36	1.55	0.39	4.75	1.66	1.90	0.47	5.84	2.04	2.33	0.58	7.46	2.61	2.98	0.75
1212	0.89	6.65	2.33	2.66	0.67	2.57	0.90	1.03	0.26	3.89	1.36	1.55	0.39	4.75	1.66	1.90	0.48	5.84	2.04	2.34	0.58	7.46	2.61	2.99	0.75
1213	0.89	6.66	2.33	2.66	0.67	2.58	0.90	1.03	0.26	3.89	1.36	1.56	0.39	4.75	1.66	1.90	0.48	5.85	2.05	2.34	0.58	7.47	2.61	2.99	0.75</

UNIT HYETOGRAPH		50 YR - 24 HR				2 YR - 24 HR				5 YR - 24 HR				10 YR - 24 HR				25 YR - 24 HR				100 YR - 24 HR			
	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Time	1 INCH	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY	4 TH DAY	3 RD DAY	2 ND DAY	1 ST DAY
1224	0.90	6.72	2.35	2.69	0.67	2.60	0.91	1.04	0.26	3.92	1.37	1.57	0.39	4.80	1.68	1.92	0.48	5.90	2.06	2.36	0.59	7.54	2.64	3.02	0.75
1225	0.90	6.72	2.35	2.69	0.67	2.60	0.91	1.04	0.26	3.93	1.37	1.57	0.39	4.80	1.68	1.92	0.48	5.90	2.07	2.36	0.59	7.55	2.64	3.02	0.75
1226	0.90	6.73	2.36	2.69	0.67	2.60	0.91	1.04	0.26	3.93	1.38	1.57	0.39	4.81	1.68	1.92	0.48	5.91	2.07	2.36	0.59	7.55	2.64	3.02	0.76
1227	0.90	6.74	2.36	2.69	0.67	2.61	0.91	1.04	0.26	3.93	1.38	1.57	0.39	4.81	1.68	1.92	0.48	5.91	2.07	2.37	0.59	7.56	2.64	3.02	0.76
1228	0.90	6.74	2.36	2.70	0.67	2.61	0.91	1.04	0.26	3.94	1.38	1.57	0.39	4.81	1.68	1.93	0.48	5.92	2.07	2.37	0.59	7.56	2.65	3.03	0.76
1229	0.90	6.75	2.36	2.70	0.67	2.61	0.91	1.04	0.26	3.94	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.92	2.07	2.37	0.59	7.57	2.65	3.03	0.76
1230	0.90	6.75	2.36	2.70	0.68	2.61	0.91	1.04	0.26	3.94	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.07	2.37	0.59	7.57	2.65	3.03	0.76
1231	0.90	6.76	2.36	2.70	0.68	2.61	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.82	1.69	1.93	0.48	5.93	2.08	2.37	0.59	7.58	2.65	3.03	0.76
1232	0.90	6.76	2.37	2.70	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.39	4.83	1.69	1.93	0.48	5.94	2.08	2.37	0.59	7.59	2.65	3.03	0.76
1233	0.90	6.77	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.40	4.83	1.69	1.93	0.48	5.94	2.08	2.38	0.59	7.59	2.66	3.04	0.76
1234	0.90	6.77	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.95	1.38	1.58	0.40	4.83	1.69	1.93	0.48	5.94	2.08	2.38	0.59	7.60	2.66	3.04	0.76
1235	0.90	6.78	2.37	2.71	0.68	2.62	0.92	1.05	0.26	3.96	1.38	1.58	0.40	4.84	1.69	1.94	0.48	5.95	2.08	2.38	0.59	7.60	2.66	3.04	0.76
1240	0.91	6.80	2.38	2.72	0.68	2.63	0.92	1.05	0.26	3.97	1.39	1.59	0.40	4.86	1.70	1.94	0.49	5.97	2.09	2.39	0.60	7.63	2.67	3.05	0.76
1245	0.91	6.82	2.39	2.73	0.68	2.64	0.92	1.06	0.26	3.99	1.39	1.59	0.40	4.87	1.71	1.95	0.49	5.99	2.10	2.40	0.60	7.66	2.68	3.06	0.77
1250	0.91	6.85	2.40	2.74	0.68	2.65	0.93	1.06	0.26	4.00	1.40	1.60	0.40	4.89	1.71	1.96	0.49	6.01	2.10	2.40	0.60	7.68	2.69	3.07	0.77
1255	0.92	6.87	2.40	2.75	0.69	2.66	0.93	1.06	0.27	4.01	1.40	1.60	0.40	4.91	1.72	1.96	0.49	6.03	2.11	2.41	0.60	7.71	2.70	3.08	0.77
1260	0.92	6.89	2.41	2.76	0.69	2.67	0.93	1.07	0.27	4.02	1.41	1.61	0.40	4.92	1.72	1.97	0.49	6.05	2.12	2.42	0.61	7.73	2.71	3.09	0.77
1265	0.92	6.91	2.42	2.77	0.69	2.68	0.94	1.07	0.27	4.04	1.41	1.62	0.40	4.94	1.73	1.97	0.49	6.07	2.12	2.43	0.61	7.76	2.71	3.10	0.78
1270	0.92	6.93	2.43	2.77	0.69	2.68	0.94	1.07	0.27	4.05	1.42	1.62	0.40	4.95	1.73	1.98	0.50	6.09	2.13	2.44	0.61	7.78	2.72	3.11	0.78
1275	0.93	6.96	2.43	2.78	0.70	2.69	0.94	1.08	0.27	4.06	1.42	1.62	0.41	4.97	1.74	1.99	0.50	6.11	2.14	2.44	0.61	7.80	2.73	3.12	0.78
1280	0.93	6.98	2.44	2.79	0.70	2.70	0.94	1.08	0.27	4.07	1.43	1.63	0.41	4.98	1.74	1.99	0.50	6.12	2.14	2.45	0.61	7.83	2.74	3.13	0.78
1285	0.93	7.00	2.45	2.80	0.70	2.71	0.95	1.08	0.27	4.09	1.43	1.63	0.41	5.00	1.75	2.00	0.50	6.14	2.15	2.46	0.61	7.85	2.75	3.14	0.78
1290	0.94	7.02	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.10	1.43	1.64	0.41	5.01	1.75	2.00	0.50	6.16	2.16	2.46	0.62	7.87	2.76	3.15	0.79
1295	0.94	7.04	2.46	2.81	0.70	2.72	0.95	1.09	0.27	4.11	1.44	1.64	0.41	5.02	1.76	2.01	0.50	6.18	2.16	2.47	0.62	7.89	2.76	3.16	0.79
1300	0.94	7.05	2.47	2.82	0.71	2.73	0.96	1.09	0.27	4.12	1.44	1.65	0.41	5.04	1.76	2.01	0.50	6.19	2.17	2.48	0.62	7.91	2.77	3.17	0.79
1305	0.94	7.07	2.48	2.83	0.71	2.74	0.96	1.09	0.27	4.13	1.45	1.65	0.41	5.05	1.77	2.02	0.50	6.21	2.17	2.48	0.62	7.94	2.78	3.17	0.79
1310	0.95	7.09	2.48	2.84	0.71	2.74	0.96	1.10	0.27	4.14	1.45	1.66	0.41	5.06	1.77	2.03	0.51	6.23	2.18	2.49	0.62	7.96	2.78	3.18	0.80
1315	0.95	7.11	2.49	2.84	0.71	2.75	0.96	1.10	0.28	4.15	1.45	1.66	0.42	5.08	1.78	2.03	0.51	6.24	2.18	2.50	0.62	7.98	2.79	3.19	0.80
1320	0.95	7.13	2.49	2.85	0.71	2.76	0.97	1.10	0.28	4.16	1.46	1.66	0.42	5.09	1.78	2.04	0.51	6.26	2.19	2.50	0.63	8.00	2.80	3.20	0.80
1325	0.95	7.14	2.50	2.86	0.71	2.77	0.97	1.11	0.28	4.17	1.46	1.67	0.42	5.10	1.79	2.04	0.51	6.27	2.20	2.51	0.63	8.02	2.81	3.21	0.80
1330	0.95	7.16	2.51	2.86	0.72	2.77	0.97	1.11	0.28	4.18	1.46	1.67	0.42	5.11	1.79	2.05	0.51	6.29	2.20	2.52	0.63	8.04	2.81	3.21	0.80
1335	0.96	7.18	2.51	2.87	0.72	2.78	0.97	1.11	0.28	4.19	1.47	1.68	0.42	5.13	1.79	2.05	0.51	6.30	2.21	2.52	0.63	8.06	2.82	3.22	0.81
1340	0.96	7.20	2.52	2.88	0.72	2.79	0.97	1.11	0.28	4.20	1.47	1.68	0.42	5.14	1.80	2.06	0.51	6.32	2.21	2.53	0.63	8.07	2.83	3.23	0.81
1345	0.96	7.21	2.52	2.89	0.72	2.79	0.98	1.12	0.28	4.21	1.47	1.69	0.42	5.15	1.80	2.06	0.52	6.33	2.22	2.53	0.63	8.09	2.83	3.24	0.81
1350	0.96	7.23	2.53	2.89	0.72	2.80	0.98	1.12	0.28	4.22	1.48	1.69	0.42	5.16	1.81	2.06	0.52	6.35	2.22	2.54	0.63	8.11	2.84	3.24	0.81
1355	0.97	7.25	2.54	2.90	0.72	2.80	0.98	1.12	0.28	4.23	1.48	1.69	0.42	5.17	1.81	2.07	0.52	6.36	2.23	2.54	0.64	8.13	2.85	3.25	0.81
1360	0.97	7.26	2.54	2.90	0.73	2.81	0.98	1.12	0.28	4.24	1.48	1.70	0.42	5.19	1.81	2.07	0.52	6.38	2.23	2.55	0.64	8.15	2.85	3.26	0.81
1365	0.97	7.28	2.55	2.91	0.73	2.82	0.99	1.13	0.28	4.25	1.49	1.70	0.43	5.20	1.82	2.08	0.52	6.39	2.24	2.56	0.64	8.17	2.86	3.27	0.82
1370	0.97	7.29	2.55	2.92	0.73	2.82	0.99	1.13	0.28	4.26	1.49	1.70	0.43	5.21	1.82	2.08	0.52	6.40	2.24	2.56	0.64	8.18	2.86	3.27	0.82
1375	0.97	7.31	2.56	2.92	0.73	2.83	0.99	1.13	0.28	4.27	1.49	1.71	0.43	5.22	1.83	2.09	0.52	6.42	2.25	2.57	0.64	8.20	2.87	3.28	0.82
1380	0.98	7.33	2.56	2.93	0.73	2.83	0.99	1.13	0.28	4.28	1.50	1.71	0.43	5.23	1.83	2.09	0.52	6.43	2.25	2.57	0.64	8.22	2.88	3.29	0.82
1385	0.98	7.34	2.57	2.94	0.73	2.84	0.99	1.14	0.28	4.29	1.50	1.71	0.43	5.24	1.83	2.10	0.52	6.45	2.26	2.58	0.64	8.24	2.88	3.29	0.82
1390	0.98	7.36	2.57	2.94	0.74	2.85	1.00	1.14	0.28	4.30	1.50	1.72	0.43	5.25	1.84	2.10	0.53	6.46	2.26	2.58	0.65	8.25	2.89	3.30	0.83
1395	0.98	7.37	2.58	2.95	0.74	2.85	1.00	1.14	0.29	4.30	1.51	1.72	0.43	5.26	1.84	2.11	0.53	6.47	2.27	2.59	0.65	8.27	2.89	3.31	0.83
1400	0.98	7.39	2.58	2.95	0.74	2.86	1.00	1.14	0.29	4.31	1.51	1.73	0.43	5.27	1.85	2.11	0.53	6.48	2.27	2.59	0.65	8.29	2.90	3.31	0.83
1405	0.99	7.40	2.59	2.96	0.74	2.86	1.00	1.15	0.29	4.32	1.51	1.73	0.43	5.28	1.85	2.11	0.53	6.50	2.27	2.60	0.65	8.30	2.91	3.32	0.83
1410	0.99	7.42	2.60	2.97	0.74	2.87	1.00	1.15	0.29	4.33	1.52	1.73	0.43	5.29	1.85	2.12	0.53	6.51	2.28	2.60	0.65	8.32	2.91	3.33	0.83
1415	0.99	7.43	2.60	2.97	0.74	2.88	1.01	1.15	0.29	4.34	1.52	1.74	0.43	5.30	1.86	2.12	0.53	6.52	2.28	2.61	0.65	8.34	2.92	3.33	0.83
1420	0.99	7.44	2.61	2.98	0.74	2.88	1.01	1.15	0.29	4.35	1.52	1.74	0.43	5.31	1.86	2.13	0.53	6.54	2.29	2.61	0.65	8.35	2.92	3.34	0.84
1425																									

WVF1 STA 1407+45.fm8 Report

Label	Solve For	Friction Method	Roughness Coefficient	Channel Slope (ft/ft)	Water Surface Elevation (ft)	Elevation Range	Discharge (ft ³ /s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)
STA 0+10	Normal Depth	Manning Formula	0.080	0.02764	1015.92	1012.69 to 1018.04 ft	138.00	34.92	24.12	1.45	22.83
STA 0+20	Normal Depth	Manning Formula	0.080	0.02764	1015.21	1012.02 to 1017.95 ft	138.00	34.00	22.56	1.51	20.98
STA 0+30	Normal Depth	Manning Formula	0.080	0.02764	1014.96	1010.94 to 1015.76 ft	138.00	35.59	25.29	1.41	21.62
STA 0+40	Normal Depth	Manning Formula	0.080	0.10784	1011.34	1008.69 to 1014.08 ft	138.00	17.34	11.64	1.49	9.33
STA 0+50	Normal Depth	Manning Formula	0.080	0.10784	1009.61	1007.82 to 1013.02 ft	138.00	20.60	17.89	1.15	17.02
STA 0+60	Normal Depth	Manning Formula	0.080	0.10784	1008.42	1006.19 to 1010.07 ft	138.00	19.08	14.79	1.29	13.92
STA 0+68	Normal Depth	Manning Formula	0.080	0.10784	1007.12	1005.79 to 1008.26 ft	138.00	22.46	22.21	1.01	21.72

Normal Depth (ft)	Critical Depth (ft)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Froude Number	Flow Type	Notes	Messages
3.23	2.60	0.09448	3.95	0.24	3.47	0.56	Subcritical		
3.19	2.52	0.09441	4.06	0.26	3.44	0.56	Subcritical		
4.02	3.13	0.10577	3.88	0.23	4.26	0.53	Subcritical		
2.65	2.69	0.10167	7.96	0.98	3.63	1.03	Supercritical		
1.79	1.85	0.09251	6.70	0.70	2.49	1.07	Supercritical		
2.23	2.32	0.08998	7.23	0.81	3.04	1.09	Supercritical		
1.33	1.38	0.09403	6.15	0.59	1.92	1.07	Supercritical		

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Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemens Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666

Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

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Worksheet for STA 0+10

Results

Critical Depth	2.60	ft
Critical Slope	0.09448	ft/ft
Velocity	3.95	ft/s
Velocity Head	0.24	ft
Specific Energy	3.47	ft
Froude Number	0.56	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.23	ft
Critical Depth	2.60	ft
Channel Slope	0.02764	ft/ft
Critical Slope	0.09448	ft/ft

Cross Section for STA 0+10

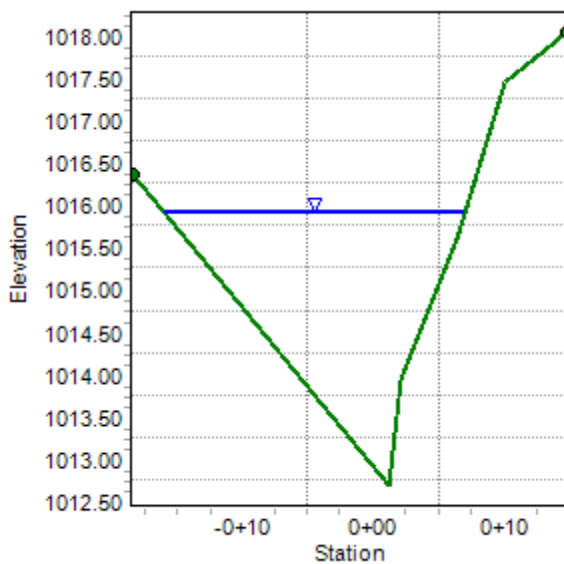
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02764	ft/ft
Normal Depth	3.23	ft
Discharge	138.00	ft ³ /s

Cross Section Image



Worksheet for STA 0+20

Results

Critical Depth	2.52	ft
Critical Slope	0.09441	ft/ft
Velocity	4.06	ft/s
Velocity Head	0.26	ft
Specific Energy	3.44	ft
Froude Number	0.56	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.19	ft
Critical Depth	2.52	ft
Channel Slope	0.02764	ft/ft
Critical Slope	0.09441	ft/ft

Worksheet for STA 0+30

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02764 ft/ft
Discharge 138.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+27	1015.76
-0+13	1014.87
-0+09	1014.52
-0+06	1013.92
-0+02	1013.07
0+03	1011.99
0+05	1010.94
0+06	1011.15
0+07	1015.16
0+10	1015.45

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+27, 1015.76)	(0+10, 1015.45)	0.080

Options

Current Roughness weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 4.02 ft
Elevation Range 1010.94 to 1015.76 ft
Flow Area 35.59 ft²

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Worksheet for STA 0+30

Results

Wetted Perimeter	25.29	ft
Hydraulic Radius	1.41	ft
Top Width	21.62	ft
Normal Depth	4.02	ft
Critical Depth	3.13	ft
Critical Slope	0.10577	ft/ft
Velocity	3.88	ft/s
Velocity Head	0.23	ft
Specific Energy	4.26	ft
Froude Number	0.53	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	4.02	ft
Critical Depth	3.13	ft
Channel Slope	0.02764	ft/ft
Critical Slope	0.10577	ft/ft

Project Description

Input Data

Cross Section Image



Project Description

Input Data

Elevation (ft)

Roughness Segment Definitions

Roughness Coefficient

0.080

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Normal Depth	2.65	ft
Elevation Range	1008.69 to 1014.08	ft
Flow Area	17.34	ft²
Wetted Perimeter	11.64	ft
Hydraulic Radius	1.49	ft
Top Width	9.33	ft
Normal Depth	2.65	ft

Bentley Systems, Inc. Haestad Methods Software
5/30/2018 3:58:12 PM 27 Siemons Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Bentley Systems, Inc. Haestad Methods Software
Page 1 of 2

Worksheet for STA 0+40

Results

Critical Depth	2.69	ft
Critical Slope	0.10167	ft/ft
Velocity	7.96	ft/s
Velocity Head	0.98	ft
Specific Energy	3.63	ft
Froude Number	1.03	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.65	ft
Critical Depth	2.69	ft
Channel Slope	0.10784	ft/ft
Critical Slope	0.10167	ft/ft

Project Description

Normal Depth

138.00 ft³/s

The graph displays a parabolic profile. The Y-axis represents Elevation, ranging from 1008.50 to 1014.00 in increments of 0.50. The X-axis represents Station, ranging from -0+10 to 0+05. The profile is a green line with a minimum at station 0+00. A blue horizontal line at elevation 1011.40 is labeled with a triangle symbol.

Station	Elevation
-0+10	1013.00
-0+05	1012.40
0+00	1008.70
0+05	1012.40
0+10	1014.00

Worksheet for STA 0+50

Results

Top Width	17.02	ft
Normal Depth	1.79	ft
Critical Depth	1.85	ft
Critical Slope	0.09251	ft/ft
Velocity	6.70	ft/s
Velocity Head	0.70	ft
Specific Energy	2.49	ft
Froude Number	1.07	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.79	ft
Critical Depth	1.85	ft
Channel Slope	0.10784	ft/ft
Critical Slope	0.09251	ft/ft

Project Description

Normal Depth

138.00 ft³/s

Worksheet for STA 0+60

Results

Top Width	13.92	ft
Normal Depth	2.23	ft
Critical Depth	2.32	ft
Critical Slope	0.08998	ft/ft
Velocity	7.23	ft/s
Velocity Head	0.81	ft
Specific Energy	3.04	ft
Froude Number	1.09	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.23	ft
Critical Depth	2.32	ft
Channel Slope	0.10784	ft/ft
Critical Slope	0.08998	ft/ft

Project Description

Manning Formula

Normal Depth

138.00 ft³/s

Worksheet for STA 0+68

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.10784 ft/ft
Discharge 138.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+11	1008.26
-0+08	1007.21
-0+06	1005.88
0+02	1005.79
0+06	1005.85
0+09	1006.27
0+17	1007.76

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+11, 1008.26)	(0+17, 1007.76)	0.080

Options

Current Roughness Weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 1.33 ft
Elevation Range 1005.79 to 1008.26 ft
Flow Area 22.46 ft²
Wetted Perimeter 22.21 ft
Hydraulic Radius 1.01 ft
Top Width 21.72 ft

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Worksheet for STA 0+68

Results

Normal Depth	1.33	ft
Critical Depth	1.38	ft
Critical Slope	0.09403	ft/ft
Velocity	6.15	ft/s
Velocity Head	0.59	ft
Specific Energy	1.92	ft
Froude Number	1.07	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.33	ft
Critical Depth	1.38	ft
Channel Slope	0.10784	ft/ft
Critical Slope	0.09403	ft/ft

Cross Section for STA 0+68

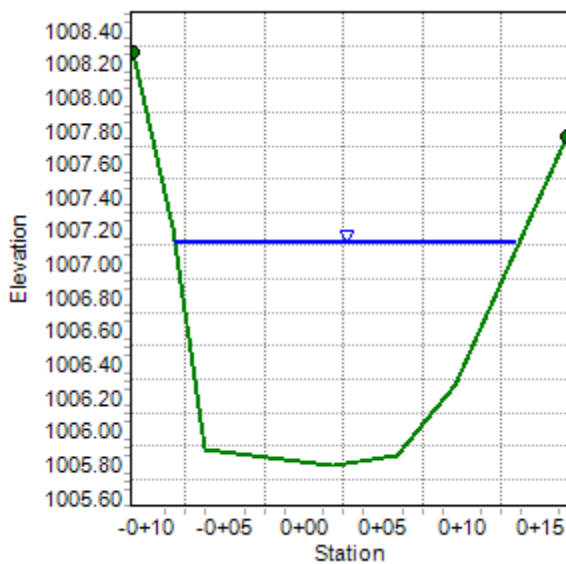
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.10784	ft/ft
Normal Depth	1.33	ft
Discharge	138.00	ft ³ /s

Cross Section Image



WVF1 STA 1416+33.fm8 Report

Label	Solve For	Friction Method	Roughness Coefficient
STA 0+10	Normal Depth	Manning Formula	0.080
STA 0+20	Normal Depth	Manning Formula	0.080
STA 0+30	Normal Depth	Manning Formula	0.080
STA 0+40	Normal Depth	Manning Formula	0.080
STA 0+50	Normal Depth	Manning Formula	0.080
STA 0+60	Normal Depth	Manning Formula	0.080
STA 0+70	Normal Depth	Manning Formula	0.080
STA 0+80	Normal Depth	Manning Formula	0.080
STA 0+90	Normal Depth	Manning Formula	0.080
STA 1+00	Normal Depth	Manning Formula	0.080
STA 1+10	Normal Depth	Manning Formula	0.080
STA 1+18	Normal Depth	Manning Formula	0.080

Channel Slope (ft/ft)	Water Surface Elevation (ft)	Elevation Range	Discharge (ft ³ /s)
0.15151	1093.28	1089.30 to 1104.20 ft	337.00
0.15151	1091.17	1087.20 to 1106.30 ft	337.00
0.15151	1089.49	1086.20 to 1107.00 ft	337.00
0.15151	1086.99	1084.60 to 1106.10 ft	337.00
0.15151	1084.36	1081.50 to 1096.10 ft	337.00
0.32350	1082.16	1079.10 to 1092.00 ft	337.00
0.05333	1082.48	1078.50 to 1097.90 ft	337.00
0.04885	1081.40	1077.10 to 1084.30 ft	337.00
0.30612	1078.74	1075.80 to 1087.70 ft	337.00
0.30612	1076.28	1073.50 to 1086.30 ft	337.00
0.30612	1074.05	1071.30 to 1085.20 ft	337.00
0.30612	1073.78	1070.30 to 1084.60 ft	337.00

METROPOLITAN WATER DISTRICT

WVF1 STA 1416+33.fm8 Report

Flow Area (ft ²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)
31.45	17.43	1.80	15.02
32.63	19.11	1.71	17.07
33.77	20.82	1.62	19.49
34.22	21.53	1.59	20.42
32.25	18.56	1.74	17.26
23.56	14.96	1.57	13.43
48.26	23.23	2.08	21.57
51.88	26.06	1.99	24.19
25.52	17.51	1.46	16.17
25.23	17.02	1.48	15.95
24.67	16.10	1.53	14.97
24.56	15.92	1.54	14.01

Normal Depth (ft)	Critical Depth (ft)	Critical Slope (ft/ft)	Velocity (ft/s)
3.98	4.45	0.08571	10.72
3.97	4.38	0.08437	10.33
3.29	3.72	0.08235	9.98
2.39	2.78	0.08077	9.85
2.86	3.32	0.08030	10.45
3.06	4.09	0.08241	14.30
3.98	3.66	0.08084	6.98
4.30	3.92	0.08291	6.50
2.94	3.82	0.08207	13.21
2.78	3.68	0.08061	13.36
2.75	3.67	0.08040	13.66
3.48	4.43	0.08440	13.72

METROPOLITAN WATER DISTRICT

WVF1 STA 1416+33.fm8 Report

Velocity Head (ft)	Specific Energy (ft)	Froude Number	Flow Type
1.78	5.76	1.31	Supercritical
1.66	5.63	1.32	Supercritical
1.55	4.84	1.34	Supercritical
1.51	3.90	1.34	Supercritical
1.70	4.56	1.35	Supercritical
3.18	6.24	1.90	Supercritical
0.76	4.73	0.82	Subcritical
0.66	4.96	0.78	Subcritical
2.71	5.65	1.85	Supercritical
2.77	5.55	1.87	Supercritical
2.90	5.65	1.88	Supercritical
2.93	6.40	1.83	Supercritical

Notes

Messages

WVF1 STA 1416+33.fm8 Report

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+10

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.15151 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+35	1104.20
-0+03	1091.20
-0+03	1090.20
0+00	1089.80
0+02	1089.30
0+08	1094.10
0+13	1098.10
0+21	1104.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+35, 1104.20)	(0+21, 1104.20)	0.080

Options

Current Roughness weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 3.98 ft
Elevation Range 1089.30 to 1104.20 ft
Flow Area 31.45 ft²
Wetted Perimeter 17.43 ft
Hydraulic Radius 1.80 ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+10

Results

Top Width	15.02	ft
Normal Depth	3.98	ft
Critical Depth	4.45	ft
Critical Slope	0.08571	ft/ft
Velocity	10.72	ft/s
Velocity Head	1.78	ft
Specific Energy	5.76	ft
Froude Number	1.31	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.98	ft
Critical Depth	4.45	ft
Channel Slope	0.15151	ft/ft
Critical Slope	0.08571	ft/ft

Cross Section for STA 0+10

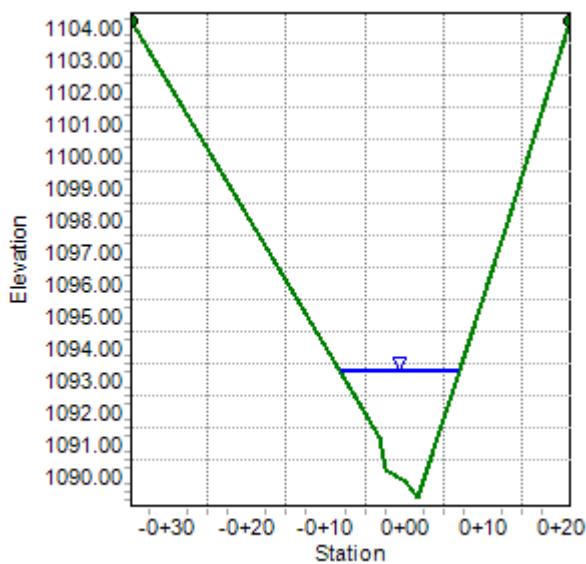
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.15151	ft/ft
Normal Depth	3.98	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Worksheet for STA 0+20

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.15151 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+43	1106.30
-0+13	1093.80
-0+11	1091.10
-0+10	1091.00
0+00	1087.60
0+01	1087.20
0+09	1093.80
0+19	1099.70
0+27	1105.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+43, 1106.30)	(0+27, 1105.30)	0.080

Options

Current Roughness Weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 3.97 ft
Elevation Range 1087.20 to 1106.30 ft
Flow Area 32.63 ft²
Wetted Perimeter 19.11 ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+20

Results

Hydraulic Radius	1.71	ft
Top Width	17.07	ft
Normal Depth	3.97	ft
Critical Depth	4.38	ft
Critical Slope	0.08437	ft/ft
Velocity	10.33	ft/s
Velocity Head	1.66	ft
Specific Energy	5.63	ft
Froude Number	1.32	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.97	ft
Critical Depth	4.38	ft
Channel Slope	0.15151	ft/ft
Critical Slope	0.08437	ft/ft

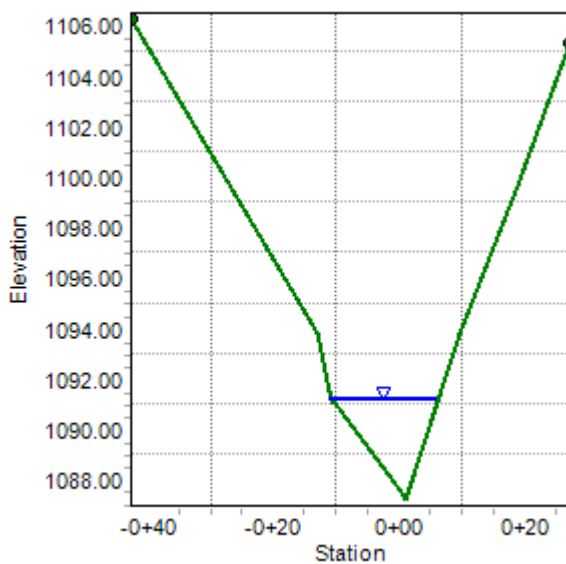
Cross Section for STA 0+20

Manning Formula

Normal Depth

0.15151 ft/ft

3.97 ft

337.00 ft³/s

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+30

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.15151 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+29	1099.60
-0+21	1096.00
-0+19	1094.80
-0+17	1093.30
-0+14	1089.70
-0+10	1089.40
0+01	1086.20
0+04	1086.50
0+13	1092.30
0+34	1107.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+29, 1099.60)	(0+34, 1107.00)	0.080

Options

Current Roughness weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 3.29 ft
Elevation Range 1086.20 to 1107.00 ft
Flow Area 33.77 ft²

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+30

Results

Wetted Perimeter	20.82	ft
Hydraulic Radius	1.62	ft
Top Width	19.49	ft
Normal Depth	3.29	ft
Critical Depth	3.72	ft
Critical Slope	0.08235	ft/ft
Velocity	9.98	ft/s
Velocity Head	1.55	ft
Specific Energy	4.84	ft
Froude Number	1.34	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.29	ft
Critical Depth	3.72	ft
Channel Slope	0.15151	ft/ft
Critical Slope	0.08235	ft/ft

Cross Section for STA 0+30

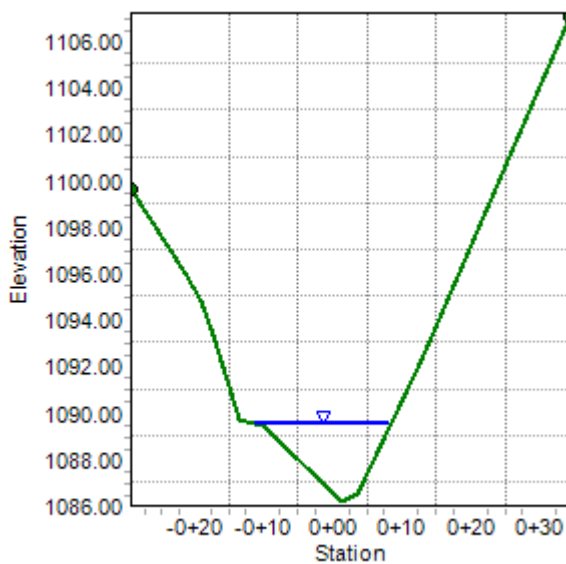
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.15151	ft/ft
Normal Depth	3.29	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Worksheet for STA 0+40

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.15151 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+42	1104.60
-0+26	1097.00
-0+18	1092.70
-0+11	1086.70
-0+10	1085.70
0+01	1084.70
0+01	1084.60
0+07	1085.30
0+08	1085.70
0+37	1106.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+42, 1104.60)	(0+37, 1106.10)	0.080

Options

Current Roughness weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 2.39 ft
Elevation Range 1084.60 to 1106.10 ft
Flow Area 34.22 ft²

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+40

Results

Wetted Perimeter	21.53	ft
Hydraulic Radius	1.59	ft
Top Width	20.42	ft
Normal Depth	2.39	ft
Critical Depth	2.78	ft
Critical Slope	0.08077	ft/ft
Velocity	9.85	ft/s
Velocity Head	1.51	ft
Specific Energy	3.90	ft
Froude Number	1.34	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.39	ft
Critical Depth	2.78	ft
Channel Slope	0.15151	ft/ft
Critical Slope	0.08077	ft/ft

Worksheet for STA 0+50

Results

Top Width	17.26	ft
Normal Depth	2.86	ft
Critical Depth	3.32	ft
Critical Slope	0.08030	ft/ft
Velocity	10.45	ft/s
Velocity Head	1.70	ft
Specific Energy	4.56	ft
Froude Number	1.35	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.86	ft
Critical Depth	3.32	ft
Channel Slope	0.15151	ft/ft
Critical Slope	0.08030	ft/ft

Cross Section for STA 0+50

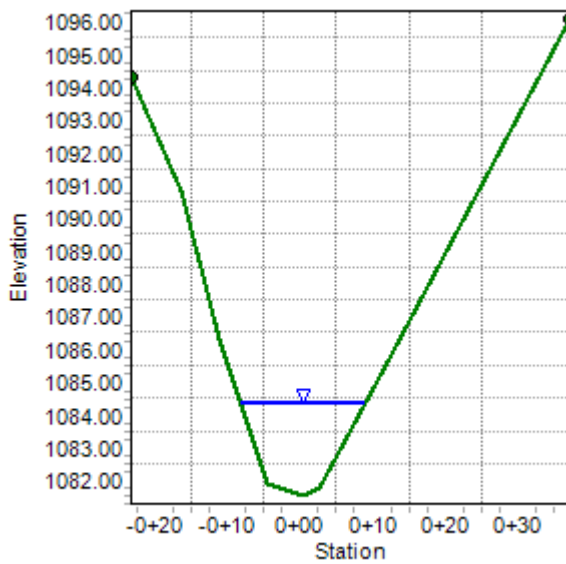
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.15151	ft/ft
Normal Depth	2.86	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Worksheet for STA 0+60

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.32350 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+20	1092.00
-0+16	1089.20
-0+14	1088.00
-0+01	1079.40
0+02	1079.10
0+12	1083.60
0+16	1085.30
0+17	1086.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+20, 1092.00)	(0+17, 1086.00)	0.080

Options

Current Roughness weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 3.06 ft
Elevation Range 1079.10 to 1092.00 ft
Flow Area 23.56 ft²
Wetted Perimeter 14.96 ft
Hydraulic Radius 1.57 ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+60

Results

Top Width	13.43	ft
Normal Depth	3.06	ft
Critical Depth	4.09	ft
Critical Slope	0.08241	ft/ft
Velocity	14.30	ft/s
Velocity Head	3.18	ft
Specific Energy	6.24	ft
Froude Number	1.90	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.06	ft
Critical Depth	4.09	ft
Channel Slope	0.32350	ft/ft
Critical Slope	0.08241	ft/ft

Worksheet for STA 0+70

Results

Normal Depth	3.98	ft
Critical Depth	3.66	ft
Critical Slope	0.08084	ft/ft
Velocity	6.98	ft/s
Velocity Head	0.76	ft
Specific Energy	4.73	ft
Froude Number	0.82	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.98	ft
Critical Depth	3.66	ft
Channel Slope	0.05333	ft/ft
Critical Slope	0.08084	ft/ft

Cross Section for STA 0+70

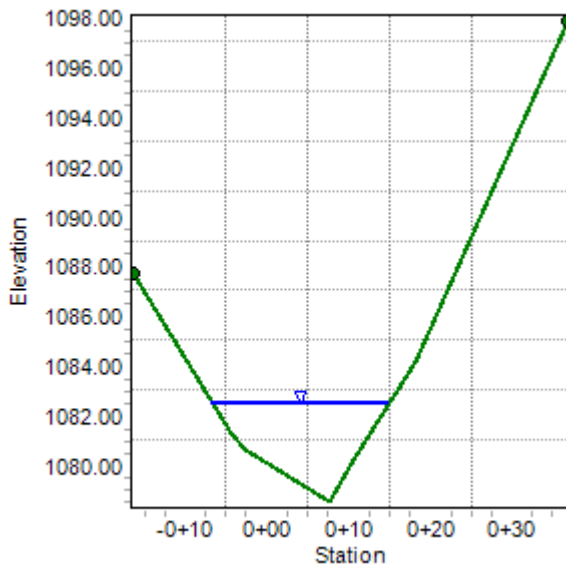
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.05333	ft/ft
Normal Depth	3.98	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Worksheet for STA 0+80

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.04885	ft/ft
Discharge	337.00	ft ³ /s
Section Definitions		

Station (ft)	Elevation (ft)
--------------	----------------

-0+13	1084.30
-0+05	1080.70
0+00	1079.70
0+04	1078.50
0+09	1077.10
0+09	1077.70
0+12	1078.40
0+18	1081.60
0+21	1083.90

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+13, 1084.30)	(0+21, 1083.90)	0.080

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	4.30	ft
Elevation Range	1077.10 to 1084.30	ft
Flow Area	51.88	ft²
Wetted Perimeter	26.06	ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+80

Results

Hydraulic Radius	1.99	ft
Top Width	24.19	ft
Normal Depth	4.30	ft
Critical Depth	3.92	ft
Critical Slope	0.08291	ft/ft
Velocity	6.50	ft/s
Velocity Head	0.66	ft
Specific Energy	4.96	ft
Froude Number	0.78	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	4.30	ft
Critical Depth	3.92	ft
Channel Slope	0.04885	ft/ft
Critical Slope	0.08291	ft/ft

Cross Section for STA 0+80

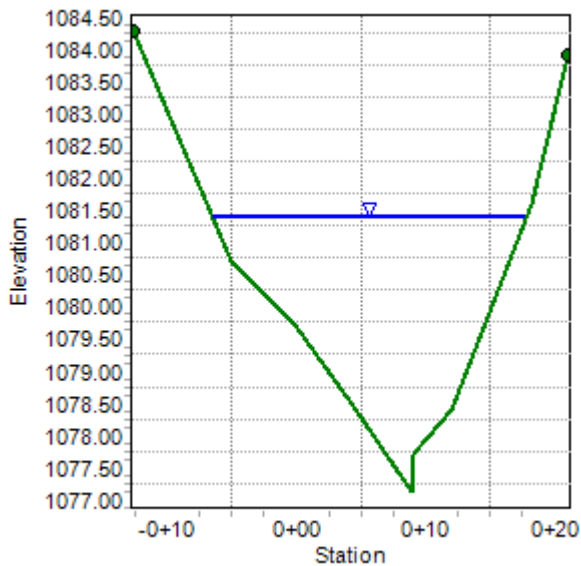
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.04885	ft/ft
Normal Depth	4.30	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Worksheet for STA 0+90

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.30612 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+14	1082.20
-0+05	1079.40
-0+02	1078.60
0+03	1077.20
0+10	1075.80
0+17	1081.30
0+26	1087.70

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+14, 1082.20)	(0+26, 1087.70)	0.080

Options

Current Roughness Weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 2.94 ft
Elevation Range 1075.80 to 1087.70 ft
Flow Area 25.52 ft²
Wetted Perimeter 17.51 ft
Hydraulic Radius 1.46 ft
Top Width 16.17 ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 0+90

Results

Normal Depth	2.94	ft
Critical Depth	3.82	ft
Critical Slope	0.08207	ft/ft
Velocity	13.21	ft/s
Velocity Head	2.71	ft
Specific Energy	5.65	ft
Froude Number	1.85	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.94	ft
Critical Depth	3.82	ft
Channel Slope	0.30612	ft/ft
Critical Slope	0.08207	ft/ft

Worksheet for STA 1+00

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.30612 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+15	1080.90
-0+11	1078.70
-0+10	1078.00
0+02	1074.10
0+05	1073.50
0+08	1074.00
0+11	1075.70
0+14	1077.90
0+24	1086.30

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+15, 1080.90)	(0+24, 1086.30)	0.080

Options

Current Roughness Weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 2.78 ft
Elevation Range 1073.50 to 1086.30 ft
Flow Area 25.23 ft²
Wetted Perimeter 17.02 ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 1+00

Results

Hydraulic Radius	1.48	ft
Top Width	15.95	ft
Normal Depth	2.78	ft
Critical Depth	3.68	ft
Critical Slope	0.08061	ft/ft
Velocity	13.36	ft/s
Velocity Head	2.77	ft
Specific Energy	5.55	ft
Froude Number	1.87	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.78	ft
Critical Depth	3.68	ft
Channel Slope	0.30612	ft/ft
Critical Slope	0.08061	ft/ft

Cross Section for STA 1+00

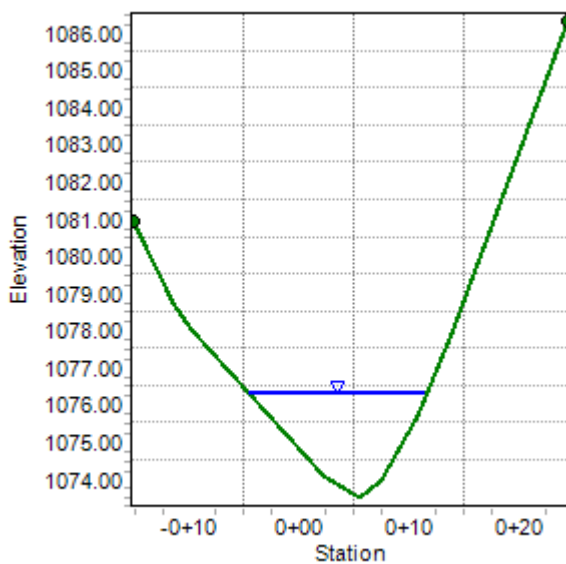
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.30612	ft/ft
Normal Depth	2.78	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Worksheet for STA 1+10

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.30612 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+23	1085.20
-0+16	1080.50
-0+15	1079.20
-0+14	1078.80
-0+05	1073.10
-0+04	1073.00
0+01	1071.30
0+05	1072.00
0+11	1075.30
0+17	1079.30
0+20	1081.90

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+23, 1085.20)	(0+20, 1081.90)	0.080

Options

Current Roughness Weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 2.75 ft
Elevation Range 1071.30 to 1085.20 ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 1+10

Results

Flow Area	24.67	ft ²
Wetted Perimeter	16.10	ft
Hydraulic Radius	1.53	ft
Top Width	14.97	ft
Normal Depth	2.75	ft
Critical Depth	3.67	ft
Critical Slope	0.08040	ft/ft
Velocity	13.66	ft/s
Velocity Head	2.90	ft
Specific Energy	5.65	ft
Froude Number	1.88	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.75	ft
Critical Depth	3.67	ft
Channel Slope	0.30612	ft/ft
Critical Slope	0.08040	ft/ft

Cross Section for STA 1+10

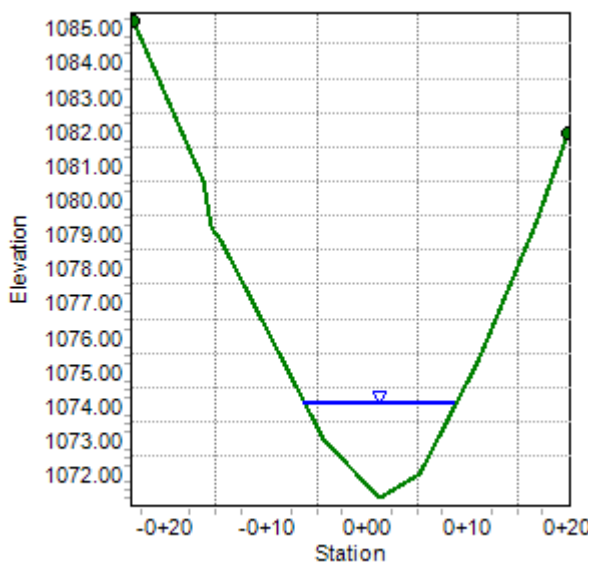
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.30612	ft/ft
Normal Depth	2.75	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Worksheet for STA 1+18

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.30612 ft/ft
Discharge 337.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
-0+23	1084.60
-0+07	1073.70
-0+05	1072.50
0+01	1070.30
0+03	1072.20
0+13	1076.10
0+18	1080.00
0+20	1081.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+23, 1084.60)	(0+20, 1081.20)	0.080

Options

Current Roughness weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 3.48 ft
Elevation Range 1070.30 to 1084.60 ft
Flow Area 24.56 ft²
Wetted Perimeter 15.92 ft
Hydraulic Radius 1.54 ft

METROPOLITAN WATER DISTRICT

Worksheet for STA 1+18

Results

Top Width	14.01	ft
Normal Depth	3.48	ft
Critical Depth	4.43	ft
Critical Slope	0.08440	ft/ft
Velocity	13.72	ft/s
Velocity Head	2.93	ft
Specific Energy	6.40	ft
Froude Number	1.83	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.48	ft
Critical Depth	4.43	ft
Channel Slope	0.30612	ft/ft
Critical Slope	0.08440	ft/ft

Cross Section for STA 1+18

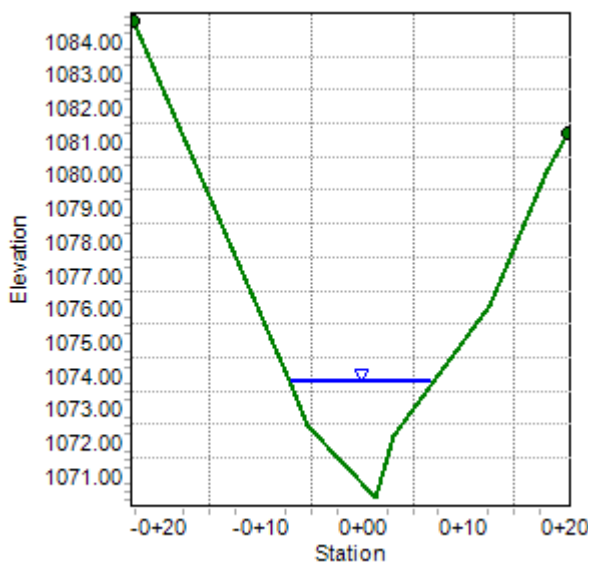
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.30612	ft/ft
Normal Depth	3.48	ft
Discharge	337.00	ft ³ /s

Cross Section Image



Appendix B

Culvert Crossing Calculations

HY-8 Culvert Analysis Report
WVF1 STA 1407+45

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 28 cfs

Design Flow: 138 cfs

Maximum Flow: 162 cfs

Table 1 - Summary of Culvert Flows at Crossing: WVF STA 1407+45

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
1013.93	28.00	28.00	0.00	1
1014.21	41.40	41.40	0.00	1
1014.52	54.80	54.80	0.00	1
1014.80	68.20	68.20	0.00	1
1015.06	81.60	81.60	0.00	1
1015.32	95.00	95.00	0.00	1
1015.59	108.40	108.40	0.00	1
1015.87	121.80	121.80	0.00	1
1016.17	135.20	135.20	0.00	1
1016.23	138.00	138.00	0.00	1
1016.85	162.00	162.00	0.00	1
1018.04	199.91	199.91	0.00	Overtopping

Rating Curve Plot for Crossing: WVF STA 1407+45

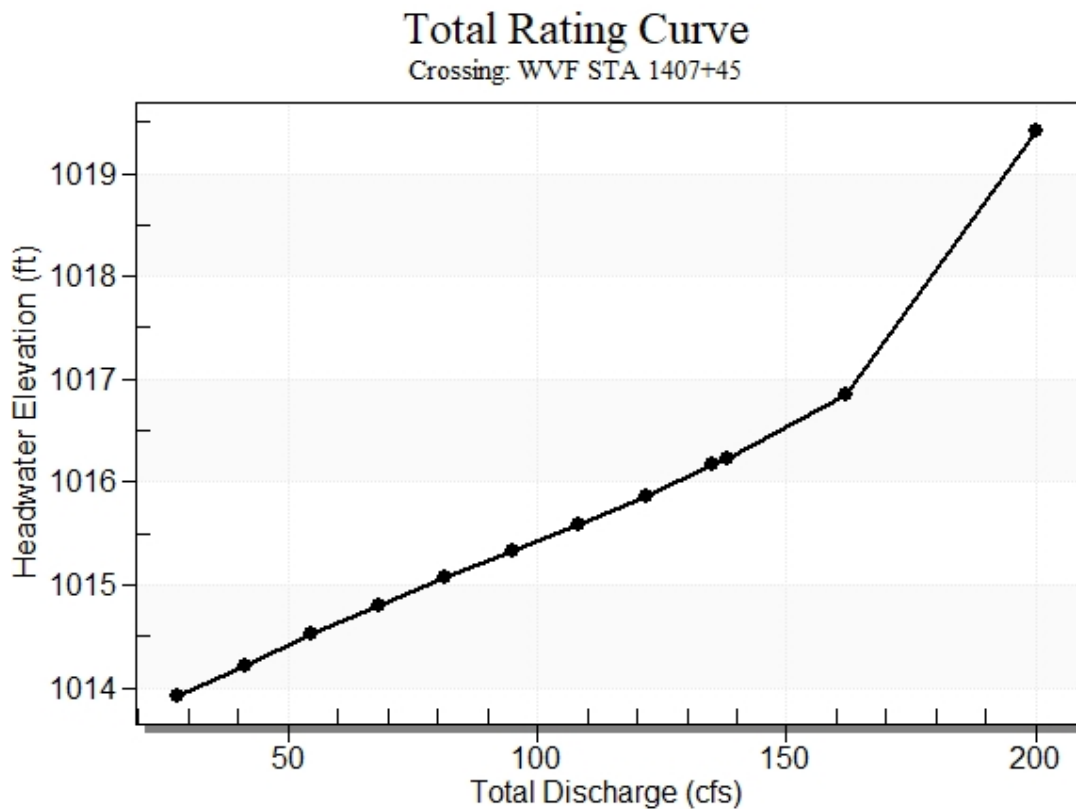


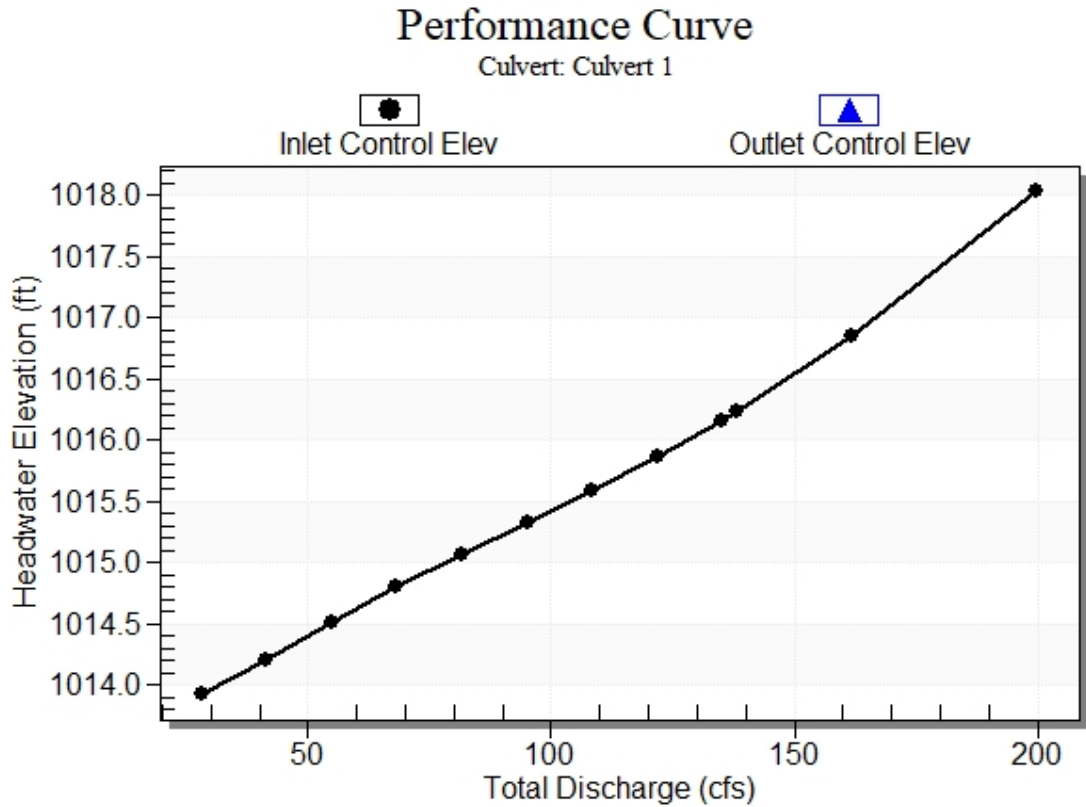
Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
28.00	28.00	1013.93	1.198	0.0*	1-S2n	0.373	0.962	0.373	0.572	17.733	3.601
41.40	41.40	1014.21	1.476	0.0*	1-S2n	0.451	1.180	0.507	0.701	16.936	4.129
54.80	54.80	1014.52	1.785	0.0*	1-S2n	0.517	1.369	0.592	0.814	17.806	4.544
68.20	68.20	1014.80	2.069	0.0*	1-S2n	0.575	1.534	0.671	0.914	18.529	4.890
81.60	81.60	1015.06	2.335	0.0*	1-S2n	0.629	1.683	0.745	1.006	19.135	5.189
95.00	95.00	1015.32	2.594	0.0*	1-S2n	0.679	1.823	0.817	1.091	19.652	5.453
108.40	108.40	1015.59	2.858	0.0*	1-S2n	0.725	1.950	0.886	1.170	19.996	5.690
121.80	121.80	1015.87	3.137	0.0*	5-S2n	0.770	2.073	0.952	1.245	20.329	5.906
135.20	135.20	1016.17	3.436	0.0*	5-S2n	0.812	2.184	1.016	1.317	20.643	6.105
138.00	138.00	1016.23	3.502	0.0*	5-S2n	0.820	2.207	1.029	1.331	20.712	6.144
162.00	162.00	1016.85	4.118	0.0*	5-S2n	0.891	2.384	1.136	1.450	21.248	6.457

* Full Flow Headwater elevation is below inlet invert.

Straight Culvert
Inlet Elevation (invert): 1012.73 ft, Outlet Elevation (invert): 1005.93 ft
Culvert Length: 50.46 ft, Culvert Slope: 0.1360

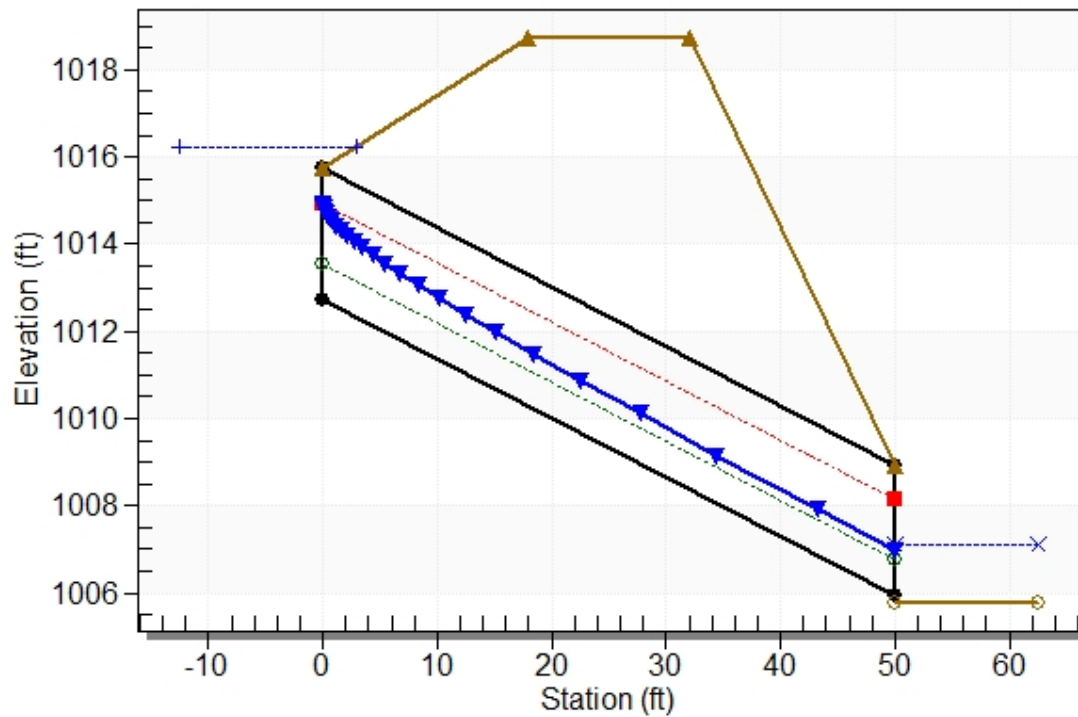
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1

Crossing - WVF STA 1407+45, Design Discharge - 138.0 cfs

Culvert - Culvert 1, Culvert Discharge - 138.0 cfs



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1012.73 ft

Outlet Station: 50.00 ft

Outlet Elevation: 1005.93 ft

Number of Barrels: 3

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: WVF STA 1407+45)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
28.00	1006.36	0.57	3.60	3.85	0.94
41.40	1006.49	0.70	4.13	4.72	0.97
54.80	1006.60	0.81	4.54	5.47	0.99
68.20	1006.70	0.91	4.89	6.15	1.01
81.60	1006.80	1.01	5.19	6.76	1.02
95.00	1006.88	1.09	5.45	7.34	1.04
108.40	1006.96	1.17	5.69	7.87	1.05
121.80	1007.04	1.25	5.91	8.38	1.05
135.20	1007.11	1.32	6.10	8.86	1.06
138.00	1007.12	1.33	6.14	8.95	1.06
162.00	1007.24	1.45	6.46	9.75	1.08

Tailwater Channel Data - WVF STA 1407+45

Tailwater Channel Option: Irregular Channel

Channel Slope: 0.1078

User Defined Channel Cross-Section:

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	-10.77	1008.26	0.0800
2	-8.32	1007.21	0.0800
3	-6.30	1005.88	0.0800
4	1.89	1005.79	0.0800
5	5.94	1005.85	0.0800
6	9.49	1006.27	0.0800
7	16.58	1007.76	0.0800

Roadway Data for Crossing: WVF STA 1407+45

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
0	0.00	1018.75
1	26.78	1018.20
2	41.40	1018.04
3	126.78	1023.21

Roadway Surface: Paved

Roadway Top Width: 14.00 ft

HY-8 Culvert Analysis Report
WVF1 STA 1416+33

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 72 cfs

Design Flow: 337 cfs

Maximum Flow: 393 cfs

Table 1 - Summary of Culvert Flows at Crossing: WVF1 STA 1416+33

Headwater Elevation (ft)	Total Discharge (cfs)	Box Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
1080.83	72.00	72.00	0.00	1
1081.25	104.10	104.10	0.00	1
1081.67	136.20	136.20	0.00	1
1082.07	168.30	168.30	0.00	1
1082.44	200.40	200.40	0.00	1
1082.81	232.50	232.50	0.00	1
1083.18	264.60	264.60	0.00	1
1083.55	296.70	296.70	0.00	1
1083.94	328.80	328.80	0.00	1
1084.04	337.00	337.00	0.00	1
1084.78	393.00	393.00	0.00	1
1086.08	477.83	477.83	0.00	Overtopping

Rating Curve Plot for Crossing: WVF1 STA 1416+33

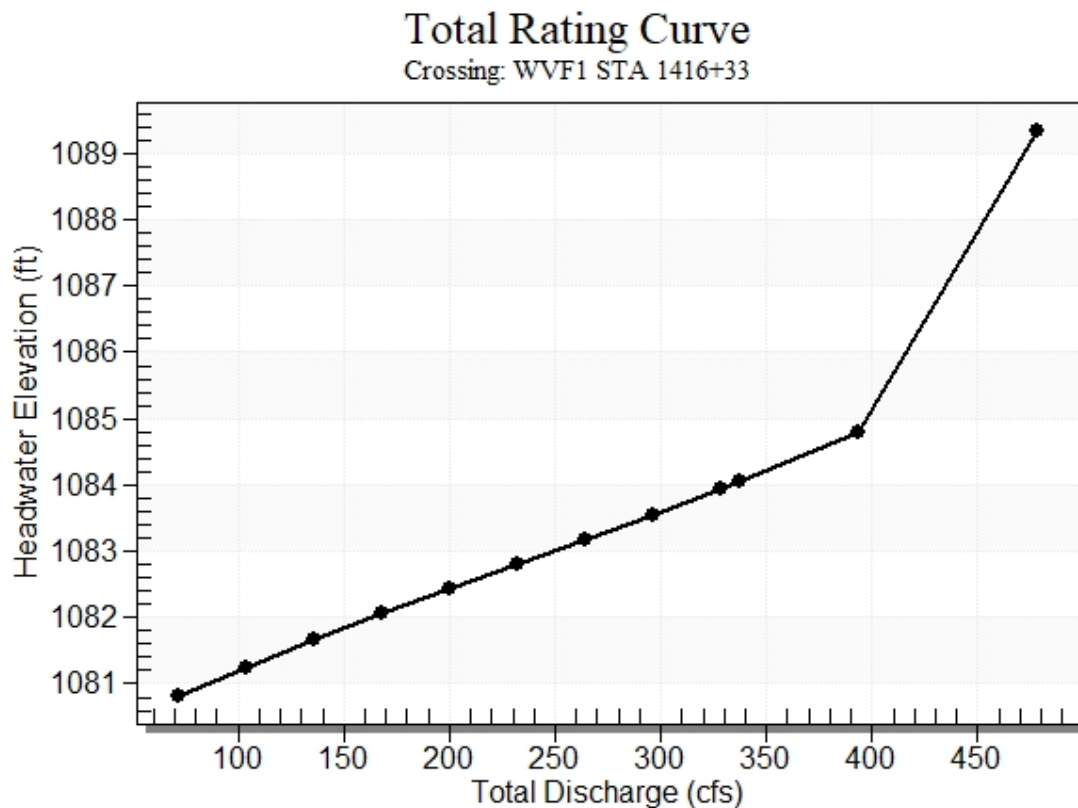


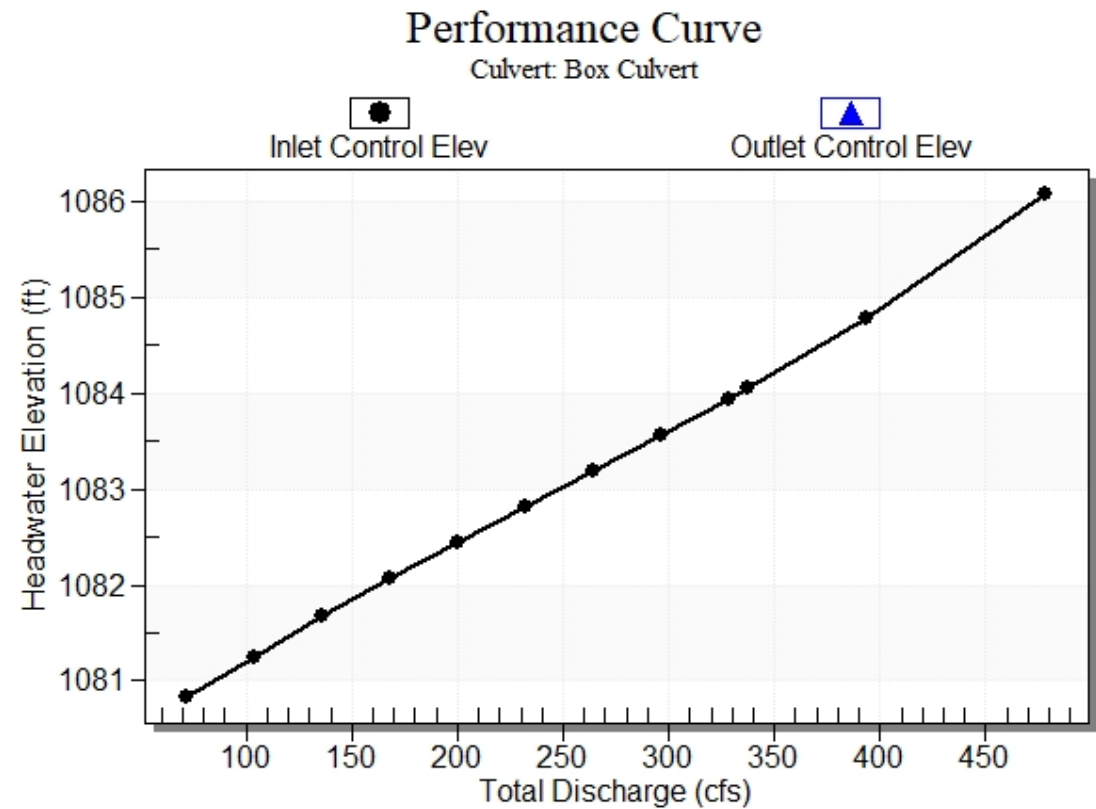
Table 2 - Culvert Summary Table: Box Culvert

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
72.00	72.00	1080.83	1.508	0.0*	1-S2n	0.280	1.038	0.313	2.503	19.167	9.717
104.10	104.10	1081.25	1.929	0.0*	1-S2n	0.355	1.327	0.407	2.874	21.341	10.655
136.20	136.20	1081.67	2.349	0.0*	1-S2n	0.423	1.587	0.493	3.178	23.031	11.396
168.30	168.30	1082.07	2.747	0.0*	1-S2n	0.485	1.828	0.585	3.450	23.987	11.946
200.40	200.40	1082.44	3.125	0.0*	1-S2n	0.544	2.054	0.677	3.695	24.674	12.325
232.50	232.50	1082.81	3.493	0.0*	1-S2n	0.601	2.267	0.764	3.902	25.362	12.724
264.60	264.60	1083.18	3.859	0.0*	1-S2n	0.654	2.472	0.854	4.087	25.834	13.093
296.70	296.70	1083.55	4.234	0.0*	5-S2n	0.707	2.668	0.941	4.255	26.286	13.435
328.80	328.80	1083.94	4.622	0.0*	5-S2n	0.757	2.857	1.027	4.410	26.684	13.755
337.00	337.00	1084.04	4.724	0.0*	5-S2n	0.770	2.904	1.048	4.448	26.797	13.834
393.00	393.00	1084.78	5.464	0.0*	5-S2n	0.855	3.218	1.197	4.689	27.356	14.339

* Full Flow Headwater elevation is below inlet invert.

Straight Culvert
Inlet Elevation (invert): 1079.32 ft, Outlet Elevation (invert): 1068.84 ft
Culvert Length: 60.91 ft, Culvert Slope: 0.1747

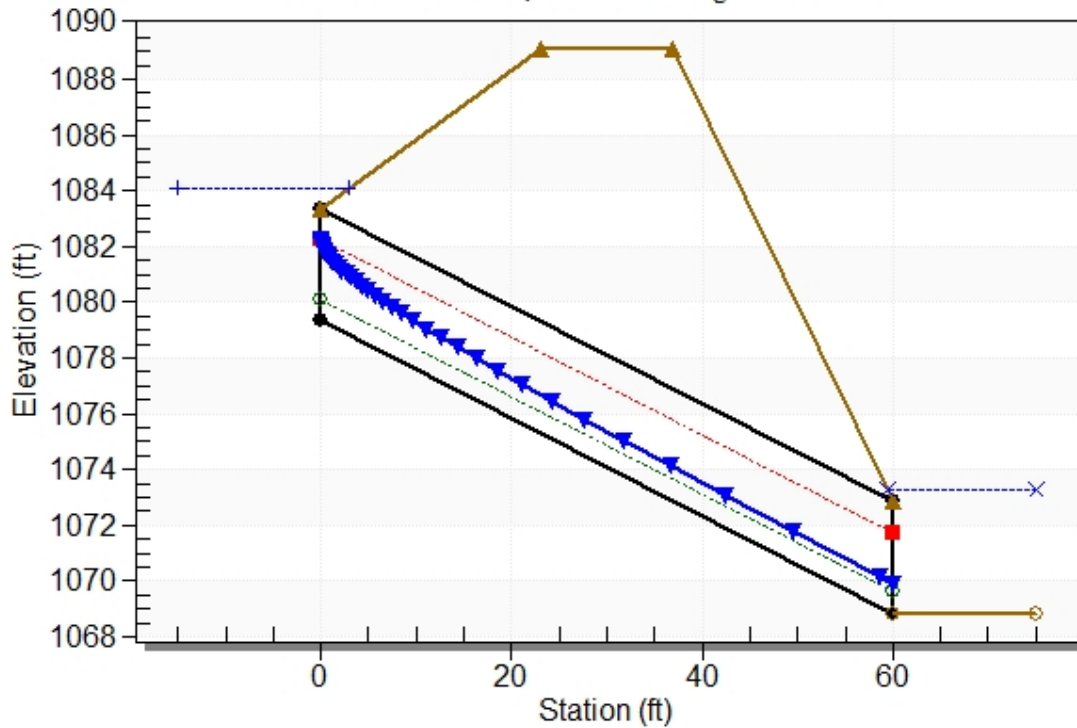
Culvert Performance Curve Plot: Box Culvert



Water Surface Profile Plot for Culvert: Box Culvert

Crossing - WVF1 STA 1416+33, Design Discharge - 337.0 cfs

Culvert - Box Culvert, Culvert Discharge - 337.0 cfs



Site Data - Box Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 1079.32 ft

Outlet Station: 60.00 ft

Outlet Elevation: 1068.84 ft

Number of Barrels: 3

Culvert Data Summary - Box Culvert

Barrel Shape: Concrete Box

Barrel Span: 4.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: WVF1 STA 1416+33)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
72.00	1071.34	2.50	9.72	47.80	1.53
104.10	1071.71	2.87	10.66	54.89	1.57
136.20	1072.02	3.18	11.40	60.71	1.59
168.30	1072.29	3.45	11.95	65.89	1.62
200.40	1072.54	3.70	12.33	70.58	1.65
232.50	1072.74	3.90	12.72	74.53	1.67
264.60	1072.93	4.09	13.09	78.06	1.69
296.70	1073.09	4.25	13.44	81.27	1.70
328.80	1073.25	4.41	13.76	84.23	1.72
337.00	1073.29	4.45	13.83	84.95	1.72
393.00	1073.53	4.69	14.34	89.57	1.75

Tailwater Channel Data - WVF1 STA 1416+33

Tailwater Channel Option: Irregular Channel

Channel Slope: 0.3061

User Defined Channel Cross-Section:

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	-22.70	1084.60	0.0800
2	-7.00	1073.70	0.0800
3	-5.40	1072.50	0.0800
4	1.30	1068.84	0.0800
5	3.10	1072.20	0.0800
6	12.50	1076.10	0.0800
7	18.10	1080.00	0.0000

Roadway Data for Crossing: WVF1 STA 1416+33

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
0	171.40	1089.11
1	199.81	1086.08
2	221.40	1087.83

Roadway Surface: Paved

Roadway Top Width: 14.00 ft

Appendix C

Preliminary Design Drawings

APPENDIX J
PROJECT NOISE CALCULATIONS

Construction Generated Noise

Building Type	Distance (ft)
Construction Noise at 50 Feet (dBA Leq)	50
Construction Phase	Minimum Required Equipment in Use¹
Ground Clearing/Demolition	84
Excavation	78
Foundation Construction	88
Building Construction	78
Finishing and Site Cleanup	84

Church to the North

Maximum Construction Noise (dBA Leq)	3,581
---------------------------------------------	-------

Construction Phase	Minimum Required Equipment in Use¹
Ground Clearing/Demolition	47
Excavation	41
Foundation Construction	51
Building Construction	41
Finishing and Site Cleanup	47

Average Construction Noise (dBA Leq)

3,581

Construction Phase	Minimum Required Equipment in Use¹
Ground Clearing/Demolition	47
Excavation	41
Foundation Construction	51
Building Construction	41
Finishing and Site Cleanup	47

Residents to the West

Maximum Construction Noise (dBA Leq)	1,982
---------------------------------------------	-------

Construction Phase	Minimum Required Equipment in Use¹
Ground Clearing/Demolition	52
Excavation	46
Foundation Construction	56
Building Construction	46
Finishing and Site Cleanup	52

Average Construction Noise (dBA Leq)

1,982

Construction Phase	Minimum Required Equipment in Use¹
Ground Clearing/Demolition	52
Excavation	46
Foundation Construction	56
Building Construction	46
Finishing and Site Cleanup	52

Park to the South

Maximum Construction Noise (dBA Leq)	502
---------------------------------------------	-----

Construction Phase	Minimum Required Equipment in Use¹
Ground Clearing/Demolition	64
Excavation	58
Foundation Construction	68
Building Construction	58
Finishing and Site Cleanup	64

Average Construction Noise (dBA Leq)

502

Construction Phase	Minimum Required Equipment in Use¹
Ground Clearing/Demolition	64
Excavation	58
Foundation Construction	68
Building Construction	58
Finishing and Site Cleanup	64

Residents to the East		
Maximum Construction Noise (dBA Leq)		1,415
Construction Phase	Minimum Required Equipment in Use¹	
Ground Clearing/Demolition	55	
Excavation	49	
Foundation Construction	59	
Building Construction	49	
Finishing and Site Cleanup	55	
Average Construction Noise (dBA Leq)		1,415
Construction Phase	Minimum Required Equipment in Use¹	
Ground Clearing/Demolition	55	
Excavation	49	
Foundation Construction	59	
Building Construction	49	
Finishing and Site Cleanup	55	
Source: Bolt, Beranek and Newman, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," prepared for the USEPA, December 31, 1971. Based on analysis for Office Building, Hotel, Hospital, School, and Public Works.		

Construction Generated Vibration

Vibration Annoyance Criteria

Church to the North			
Maximum Vibration Levels		Closest Distance (feet):	3,581
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	44	
Large bulldozer	87	44	
Small bulldozer	58	15	
Jackhammer	79	36	
Loaded trucks	86	43	
	Criteria	78	
Average Vibration Level		Average Distance (feet):	3,581
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	44	
Large bulldozer	87	44	
Small bulldozer	58	15	
Jackhammer	79	36	
Loaded trucks	86	43	
	Criteria	78	
Residents to the West			
Maximum Vibration Levels		Closest Distance (feet):	1,982
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	49	
Large bulldozer	87	49	
Small bulldozer	58	20	
Jackhammer	79	41	
Loaded trucks	86	48	
	Criteria	78	
Average Vibration Level		Average Distance (feet):	1,982
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	49	
Large bulldozer	87	49	
Small bulldozer	58	20	
Jackhammer	79	41	
Loaded trucks	86	48	
	Criteria	78	

Construction Generated Vibration

Park to the South			
Maximum Vibration Levels		Closest Distance (feet):	502
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	61	
Large bulldozer	87	61	
Small bulldozer	58	32	
Jackhammer	79	53	
Loaded trucks	86	60	
	Criteria	78	
Average Vibration Level		Average Distance (feet):	502
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	61	
Large bulldozer	87	61	
Small bulldozer	58	32	
Jackhammer	79	53	
Loaded trucks	86	60	
	Criteria	78	
Residents to the East			
Maximum Vibration Levels		Closest Distance (feet):	1,415
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	52	
Large bulldozer	87	52	
Small bulldozer	58	23	
Jackhammer	79	44	
Loaded trucks	86	51	
	Criteria	78	
Average Vibration Level		Average Distance (feet):	1,415
	Approximate Velocity	Approximate Velocity	
Equipment	Level at 25 ft, VdB	Level, VdB	
Caisson Drill	87	52	
Large bulldozer	87	52	
Small bulldozer	58	23	
Jackhammer	79	44	
Loaded trucks	86	51	
	Criteria	78	

Construction Generated Vibration

Structural Damage Criteria

Church to the North		Closest Distance (feet):	3,581
	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Equipment			
Caisson Drill	0.089	0.000	
Large bulldozer	0.089	0.000	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.000	
Loaded trucks	0.076	0.000	
	Criteria	0.200	
Residents to the West		Closest Distance (feet):	1,982
	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Equipment			
Caisson Drill	0.089	0.000	
Large bulldozer	0.089	0.000	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.000	
Loaded trucks	0.076	0.000	
	Criteria	0.200	
Park to the South		Closest Distance (feet):	502
	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Equipment			
Caisson Drill	0.089	0.001	
Large bulldozer	0.089	0.001	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.000	
Loaded trucks	0.076	0.001	
	Criteria	0.200	
Residents to the East		Closest Distance (feet):	1,415
	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Equipment			
Caisson Drill	0.089	0.000	
Large bulldozer	0.089	0.000	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.000	
Loaded trucks	0.076	0.000	
	Criteria	0.200	

Based on distance to nearest structure

¹. Determined based on use of jackhammers or pneumatic hammers that may be used for pavement demolition at a distance of 25 feet

Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

Source: Based on methodology from the United States Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment* (2006).